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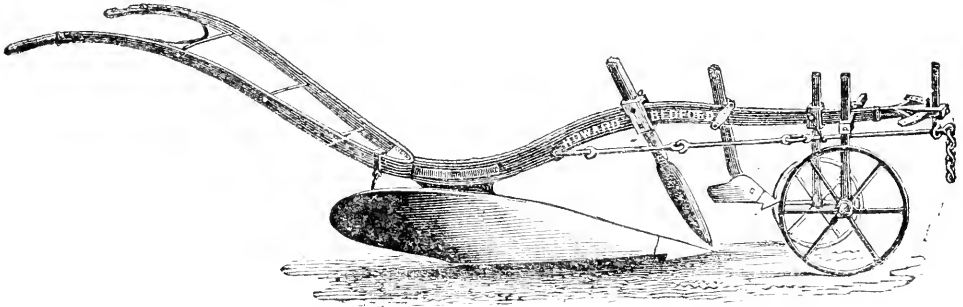
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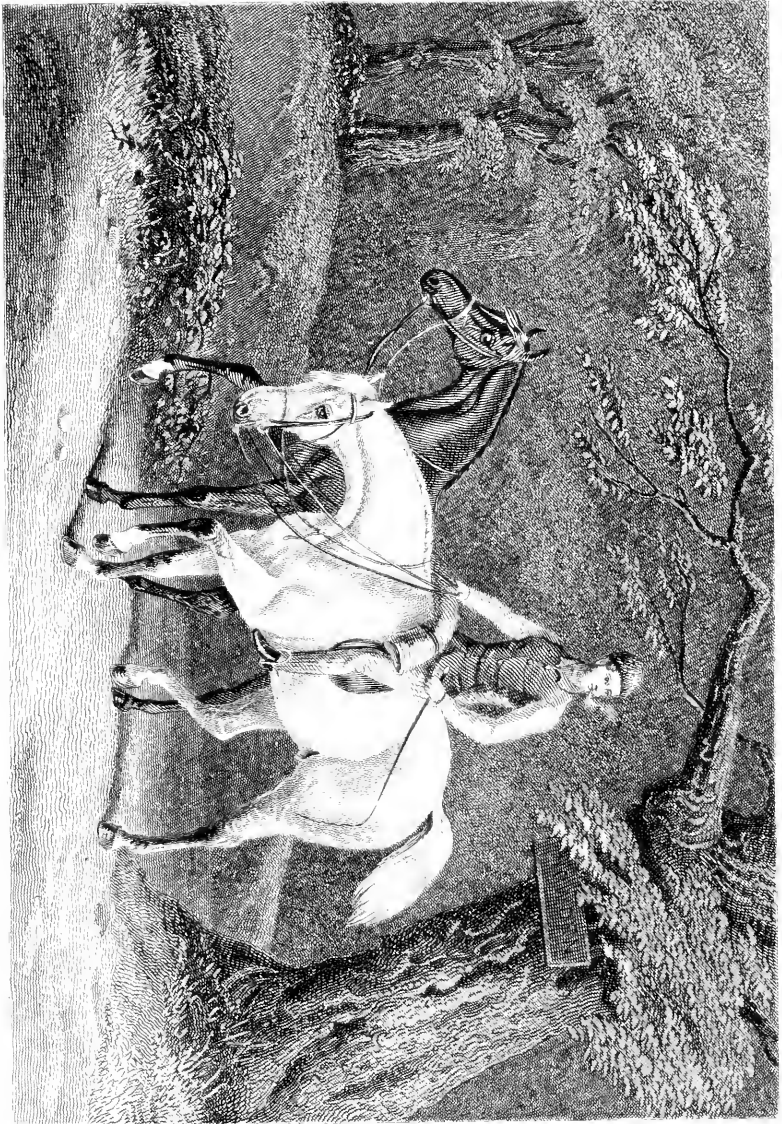
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Edward Herrison



THE FARMER'S MAGAZINE,

SEPTEMBER, 1865.

PLATE I.

PORTRAIT OF SIR EDWARD KERRISON., BART., M.P.

SIR EDWARD KERRISON, BART., M.P.,

THE LATE PRESIDENT OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Sir Edward Kerrison ranks very worthily with such men as Mr. Handley and Mr. Pusey, who at long intervals have been selected from the lower House to fill the office of President of the Royal Agricultural Society. Whether proved by the performance of his several duties in the Council Chamber, on the show-ground, or yet more practically by his business about home, Sir Edward has earned some deserved distinction as an agriculturist. His name stands upon most of the Committees in Hanover-square, and he has taken an especial interest in the education question; at the great national meetings, as well as in the Eastern Counties, his herds of highly-bred shorthorns and polled milch-cows have pretty generally their place on the prize list, while Sir Edward has also cultivated the breed of Suffolk cart-horses with proportionate success. The Hall farm and home-stead are thus well stocked with the best sorts of the district; nor has the care of the man been forgotten about Scole, for Lady Caroline Kerrison has designed and published a series of plans for labourers' cottages, which, it is understood, have been carried out on her husband's estates. To go a step further, we may say that Sir Edward has the innate taste of a country gentleman for rural sports, has a quick eye for a clever cob, and during the season may be seen twisting his team from Piccadilly into the Park, if not joining the

procession of the Four-in-hand Club on a pilgrimage to Greenwich or Richmond. Although he gives his strong support to a smart pack of harriers, Sir Edward is not himself much of a hunting man, but he is better with the trigger, and, in fact, rather a heavy game-preserver in Suffolk, and a good man on the hill in Ross-shire.

Sir Edward Kerrison's election to the post of President was a very popular one, and he has discharged the requirements of the office with every credit to himself. At Plymouth, indeed, he rode the lines day after day, followed by a servant on a high-stepping hack, with indefatigable industry, and at one time on the Wednesday had a narrow escape from being received by the West Country folks as the Prince himself.

Sir Edward Clarence Kerrison, the second baronet, was born in 1821, and succeeded his father, General Sir Edward Kerrison, in 1853. He finished his education at Oxford, and married in 1844 the Lady Caroline Margaret Fox Strangeways, daughter of the Earl of Ilchester. Sir Edward, who holds to Conservative principles, has represented Eye since 1852, and was returned at the recent election without opposition. He is a deputy-lieutenant of Suffolk, a lieutenant in the Suffolk Borders Yeomanry, and a captain of the 10th Suffolk Rifle Volunteers, a corps that owes much of its efficiency to the active interest which the Captain takes in its conduct.

Sir Edward Kerrison's character may be best gathered from the following inscription on a picture, by Richmond, which is hung in the Corn Hall at Eye:—

"This portrait of Sir Edward Clarence Kerrison, Baronet, M.P., was painted at the request of 465 subscribers, consisting of the tenantry and residents of the borough of Eye and neighbourhood, in testimony of the high esteem in which he is held as a landlord and country gentleman and neighbour, and by their desire is placed in this Corn Exchange, to the erection of which he has so liberally contributed. A.D. 1857."

Sir Edward was mainly instrumental in founding this Hall; while he has also established a reformatory at Thorndon for boys convicted of crime, has built twice over a flax factory at Eye, and done a deal for the new Middle-Class College, at Framlingham, adding the munificent gift of £2,000 to his original subscription of £500, in order that the school might start fair and free from debt.

We are indebted to a correspondent for the following curious tradition associated with the family property of the Kerrisons: "The extensive estates of Oakley Park and Brome Hall, in the county of Suffolk, are situated chiefly in the parishes of Hoxne, Thorne, Oakley, Denham, and

Eye, in a finely wooded and highly cultivated district. The manor of Oakley Park was erected, about forty years since, by the late baronet, from designs by Smithe, and is in the Grecian style a noble banquetting hall occupies the centre of the building, and is supported on handsome pillars of red granite. It is eighty-four feet long, lighted from the ceiling by dome lights. The statuary and other works of art are very valuable. This spot is the more interesting to all who take an interest in the history of England's kings, as the mansion is traditionally said to stand on the spot where King Edmund was first traced, when martyred by the Danes, and tied to an oak tree near the Old Abbey Farmhouse. The fall of this tree, only a few years since, in a still June night, was supposed to have been caused by the great weight of the night dew on the foliage. The tree was of that great age that the wood had lost all its strength, so that, instead of showing any clear rift, according to the run of the grain, it broke into all sorts of shapes; and, as if to verify the universally-believed tradition that it is the same tree where the martyrdom was committed, a large triangular piece of the oak fell out, in which is imbedded an ancient iron arrow's head. This is carefully preserved, and has afforded much interesting conjecture and discussion amongst antiquarians."

PLATE II.

TO HOWDEN.

Here is a chance for a judge to pick up a good one—not in all the crowd and bustle of the fair, or rather of the day before, for the best business at Howden is over before the fair begins—but after a quiet look over the grey as he comes in from The Grange. He is four off, by Chanticleer, and saw hounds a few times last season. Poor "Nimrod," in his famous book on *The Condition of Hunters*, tells a story, somewhat against himself, of how when he took to farming in Hampshire he drew a couple of hundred pounds to go and buy bullocks at Basingstoke. On his way, however, he met the dealer's man, with a wonderfully clever grey horse in

hand, and of course they naturally pulled up to have a word or two over so promising a nag. In quite as much a matter of course, "Nimrod" got his leg over him, and it ended by the two hundred going in a lump for the horse, instead of to its original purpose of buying beasts. Still, if we remember rightly, the moral was all the best way, for the grey turned out a clipper, and doubled the outlay very shortly afterwards.

Howden and Horncastle are the two great horse-fairs of the country, and the very names of these two towns are as suggestive of such dealings as Mark Lane is for corn or Hereford for cattle.

THE MINERAL PHOSPHATE OF LIME.

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

There is considerable reason to believe that the mineral phosphate of lime has not yet been employed, as a fertilizer, so extensively as its merits deserve. This remark applies, we think, not only to its soluble but to its insoluble state. Two prize essays on this important question are inserted in the present volume of the Highland Society's Transactions. The enquiry is not one of recent date. It was in 1845 that Professor Daubeny and Captain Wid-

ington made a voyage into Spain to examine the native phosphate of lime of Estremadura (*Jour. Roy. Ag. Soc.*, vol. v., p. 406). They found the phosphoric rock existing in large masses, a short distance from Logrosson, a considerable village, about seven Spanish leagues to the south-east of Truxillo. It there forms "a rock varying from 7 to 16 feet in breadth, traceable for nearly two miles, and extending into the earth to a great, though as

yet an unascertained, depth." Some specimens analyzed by these usefully-employed voyagers consisted, per cent., of—

Silica	1.70
Peroxide of iron	3.15
Fluoride of calcium (fluor spar)	14.00
Phosphate of lime	81.15

They brought with them to England a sufficient supply of the phosphorite for various trials. Some of these experiments were made by Dr. Daubeny, on turnips, with the following results (*ibid.*, vol. vi., p. 330):

	Roots. lbs.	Tops. lbs.
Soil simple produced per acre... ..	14,295	30,591
Manured with 10 cwt. of bone shavings per acre	19,339	35,210
Spanish phosphorite alone, 12 cwt.	28,639	42,016
Spanish phosphorite, 12 cwt., mixed with sulphuric acid	30,569	34,476
South American Guano, 260lbs.	31,114	47,060
Bones, with sulphuric acid, 11 cwt.	31,598	17,600
Bones, finely powdered, 12 cwt.	36,155	45,446
Stable dung, 22 tons	39,476	49,912

One conclusion to which these experiments tended is, as Dr. Daubeny well remarks, that "as the Spanish phosphorite, which appears to act so beneficially, is wholly destitute of organic matter, it seems to follow that the more valuable portion at least of what is applied to the land, when bones are scattered over it, is the phosphate of lime, and not, as some have supposed, the oil or gelatine."

The useful result to which the Professor was thus led was supported by the experiments of Sir Harry Verney on the use of the phosphorite as a manure. The soil to which he applied it was a heavy sandy loam, resting on a clayey subsoil: the ground was sown with mangel wurzel in 1844, whose seeds, through the extreme drought of the summer, did not vegetate sufficiently for any satisfactory conclusion. In April, 1845, the ground was sown with Chevalier barley, with the following result (*ibid.*, vol. vi., p. 333):—

	Manure per acre.			Produce.		
	Tons.	Cwts.	Qrs.	Qrs.	Bush.	Pks.
Soil simple	0	0	0	3	6	2
Burnt bones	0	13	0	5	3	2
Unburnt bones	1	7	0	5	0	0
Pigeons' dung	0	18	0	7	5	0
Spanish phosphorite and sulphuric acid	0	18	0	6	3	2
Spanish phosphorite alone	0	18	0	5	3	2
Superphosphate of lime	1	5	3	5	6	3
Stable-yard dung	20	0	0	8	2	0

Other experiments on the same important question were made by Mr. J. B. Lawes, at Rothamsted, in Hertfordshire (*ibid.*, vol. viii., p. 510). He found, in some trials upon the growth of turnips, in 1844, with various manures, that the following was the weight of the turnip bulbs per acre:—

	Tons.	Cwts.
Soil simple	2	4
Soil dressed with 3 cwt. of ground apatite, or native phosphate of lime	3	1
3 cwt. of apatite, decomposed by sulphuric acid, containing 200 lbs. of apatite	6	15
374 lbs. of apatite, decomposed by sulphuric acid, containing 104 lbs. sulphuric acid and 270 lbs. apatite	7	3
5 cwt. of superphosphate of lime	7	14
5 cwt. of superphosphate of lime—the land dug six inches deep	8	15

These trials, then, entirely accord with the experience of others on the native phosphate of lime. All these, in fact, support the conclusion which Dr. Daubeny adopted after numerous trials with the native phosphate of lime of Spanish Estremadura (*ibid.*, vol. vi., p. 329), that, whilst in

every instance a considerable increase of crop was obtained by the addition of certain fertilizers, the Spanish phosphate, especially when its action was quickened by the addition of sulphuric acid, proved nearly as efficacious as bones themselves, unless, indeed, when the latter were very finely powdered.

In 1855 another series of trials with swede turnips were reported by Professor Voelcker (*ibid.*, vol. xvi., p. 92). In these trials the ground coprolites employed were found to contain per cent.—

Hygroscopic water	1.20
Water of combination, and a trace of organic matter	3.20
Oxides of iron and alumina	4.84
Lime	39.81
Magnesia	5.68
Phosphoric acid	23.45
Carbonic acid	5.82
Insoluble siliceous matter	12.56
Alkalies, sulphuric acid, and loss... ..	3.41
	<hr/> 100.00

The result of these trials, as the Professor remarked, showed very considerable differences in the weight of the bulbs raised by an equal money-value of different manures. Thus whilst £2 worth of home-made superphosphate of lime gave an increase of 8 tons 8 cwt. 16 lbs. per acre, £2 worth of "economical" manure produced merely 16 cwt. 16 lbs. more per acre than the unmanured portion of the field. Again, it will be observed, that whilst £2 worth of dried night-soil gave only 9 tons 4 cwt. of roots, a mixture of guano and dissolved coprolites gave 12 tons 16 cwt. 16 lbs., and dissolved coprolites alone 11 tons 12 cwt.

These differences are still more strikingly exhibited in the following table, in which the different plots are arranged according to the increase which the various fertilizers employed upon each produced; the table likewise shows the cost at which 1 ton of increase was produced in each experimental trial.

Table showing Increase per Acre, and Cost of 1 ton of Increase, in 10 experimental trials upon Swedes.

	Increase			Cost of 1 ton		
	per acre.	of increase.		per ton.		
	tons.	cwts.	lbs.	£	s.	d.
Home-made superphosphate	8	8	16	0	4	0
Dissolved coprolites and guano	7	12	16	0	5	3½
Guano	6	8	56	0	6	2½
Dissolved coprolites	6	8	0	0	6	3
Mixture of guano, soot, dissolved coprolites, and bone super-phosphate	4	16	8	0	8	3½
Nut-refuse	4	16	0	0	8	4
Commercial night-soil	4	0	0	0	10	0
Bone-dust	3	12	0	0	11	1½
"Economical" manure	0	16	16	2	9	6½
Nothing (Produce of the unmanured soil per acre, 5 tons 4 cwt.)						

These trials were with the mineral phosphate of lime dissolved in sulphuric acid. Other trials have been made with the mineral phosphate alone, finely pulverized. Such were those carried on at Glasnevin, in Ireland, by Mr. Baldwin, in the season of 1859-60.

In the Glasnevin trials (*Agri. Gaz.*, 1861, p. 437) the farmyard manure was applied at the rate of 30 tons per statute acre—the artificial dressings at the uniform cost of £3 per acre. The Peruvian guano cost £13 5s., the ground bones £8, the finely-ground coprolites £4 per ton. The produce of swede turnips per acre from the land thus manured was as follows:

From farmyard manure	18 tons	15 cwt.
Peruvian guano	12	10
Dissolved coprolites	14	10
Ground bones	10	10
Dissolved bones	11	5
Ground coprolites	14	5

In the valuable series of trials lately marked by the approval of the Highland Society, the mineral phosphate was tried both in its simple state and when previously dissolved in sulphuric acid. The experiments of Mr. R. J. Thomson, of Kilmarnock, were upon yellow turnips. The whole field was manured with 25 tons of farmyard manure per acre, and so much of each artificial manure was added as to contain 150lbs. of phosphate of lime per acre. The produce, on two series of trials of turnips, in tons and cwts. was as follows (*Trans. High. Soc.*, 1865, p. 496).

	Section 1.		Section 2.	
Soil simple	16	15	13	16
Ground coprolites	16	14	14	18
Dissolved coprolites	19	13	17	11
Bone-ash	16	14	16	3
Bone-ash dissolved	19	18	17	5
Bone-ash and gypsum	18	4	17	10
Ground bones	18	10	18	2
Ground bones dissolved	19	5	18	10
Bolivian guano	18	16	17	8
Sulphuric acid	16	12	17	11
Gypsum	15	4	17	3

The quantity of sulphuric acid and gypsum applied was made equal to that in the dissolved bone-ash.

The results per acre, reported in the prize essay of Mr. S. D. Shirreff, of Salcoats, in East Lothian, were as follows. These experiments on swedes were made in the season of 1863-64 (*ibid.*, p. 501).

	Produce.
	Tons. Cwt.
4 cwt. of bone superphosphate	21 16
4 cwt. Peruvian guano	20 8
4 cwt. of coprolite phosphate	21 13
4 cwt. of Peruvian guano	21 13
4 cwt. of dissolved phosphatic guano	21 13
4 cwt. of Peruvian guano	21 13

The next trials were with the white globe turnip :

	Produce.
	Tons. Cwt.
6 cwt. of dissolved bone-ash	21 12
2 cwt. of nitrate of soda	21 19
6 cwt. of dissolved coprolites	21 19
2 cwt. of nitrate of soda	21 17
6 cwt. of bone-ash	21 17
2 cwt. of nitrate of soda	21 17

The mineral phosphates commonly employed at present by the artificial manure makers are either the coprolites of the Suffolk crag, or those from the lower chalk of Cambridgeshire, or the native phosphate of lime of Norway. These have been carefully analyzed and described by Professor Voelcker (*ibid.*, vol. xxi., p. 350). He remarks, first, of the Suffolk coprolites (pseudo or false coprolites) : "These phosphoric deposits occur in the more recent tertiary strata, as a layer varying from three to eighteen inches in thickness, between the coralline crag and London clay. The Suffolk crag is exceedingly rich in fossils, consisting partly of the fractured and rolled bones of cetaceous and other animals, with some fish-teeth, and chiefly of rolled water-worn pebbles, which were formerly supposed to be the fossilized excrements of samrian and other animals, for which reason they were called coprolites.

"Professor Buckland, however, showed that they are not true fossil excrements, but in all probability calcareous pebbles which have undergone a peculiar metamorphosis, and become impregnated with phosphoric acid by long-continued contact with decaying animal and vegetable substances.

"The name pseudo or false coprolites, which Professor Buckland proposed for them, has been generally accepted by the scientific world. In commercial phraseology, we have to understand by Suffolk-coprolites, or crag-coprolites, or pseudo-coprolites, the mixed fossil-bones,

fish-teeth, and phosphatic pebbles which occur in the Suffolk Crag.

"These phosphatic matters are distinguished from the grey-coloured chalk-coprolites by a brownish, ferruginous colour, and smoother appearance. They are very hard, and yield, on grinding, a yellowish-red powder.

The subjoined analysis represents their average composition—

Moisture and water of combination with a trace of organic matter	2.53
Lime	38.20
Magnesia	1.34
*Phosphoric acid	24.24
Oxide of Iron	4.81
Alumina	3.72
†Carbonic acid	5.37
Sulphuric acid	1.40
Potash	.56
Soda	1.18
Chlorine	.07
Fluorine and loss	4.31
Insoluble siliceous matter	12.27
	100.00

* Equal to tribasic phosphate of lime (bone-earth)	52.52
† Equal to carbonate of lime	12.20

The following is the result of an analysis of an average sample of Cambridgeshire coprolites :—

Moisture and organic matter	4.63
Lime	43.21
Magnesia	1.12
Oxide of iron	2.46
Alumina	1.36
*Phosphoric acid	25.29
†Carbonic acid	6.66
Sulphuric acid	.76
Chloride of sodium	.09
Potash	.32
Soda	.50
Insoluble siliceous matter	8.64
Fluorine and loss	4.96
	100.00

* Equal to tribasic phosphate of lime (bone-earth)	54.89
† Equal to carbonate of lime	15.13

The native phosphate of lime, or apatite, as the Professor remarks, is a hard and often well-crystallized mineral, chiefly composed of phosphoric acid and lime. It is found in this country in Devonshire, Cornwall, and Scotland, but not as yet in sufficient quantity to allow of its being collected for technical purposes. In America it is found imbedded in granite at Baltimore, in gneiss at Germantown, in mica-slate in West Greenland, in granite in Connecticut; and in granite, in Maine, and in various other localities. On the Continent it is found in several places, as in the Tyrol, Bohemia, Bavaria, Sweden, and Norway. Most commonly it occurs in thin seams, imbedded in crystalline or volcanic rocks, but seldom in sufficient quantity to repay the cost of working.

Mineralogists distinguish several varieties of apatite. Generally speaking apatite has a light green or a reddish colour. The apatite which at present is imported into England from Norway is found chiefly at Krageroe.

A specimen of red-coloured apatite furnished, on analysis, the following results :—

Hygroscopic water	4.43
Water of combination	4.40
*Phosphoric acid	41.88
Lime	53.45
†Chloride of calcium	1.61
Phosphate of iron and alumina	.66
Insoluble siliceous matter	1.24
	99.67

* Equal to tribasic phosphate of lime (bone-earth)	90.74
† Containing chlorine	1.03

This specimen had a bright red colour like ironstone, and yet it contained but very little oxide of iron. Another sample of very light green-coloured, almost white, apatite from Krageroe, contained—

Hygroscopic water	...	...	...	...	19
Water of combination	...	...	...	...	23
* Phosphoric acid	...	...	...	...	41.25
Lime	...	...	...	...	50.62
† Chloride of calcium	...	...	...	...	6.41
Oxide of iron	...	...	...	...	29
Alumina	...	...	...	...	38
Potash	...	...	...	...	04
Soda	...	...	...	...	13
Insoluble siliceous matter	...	...	...	...	82

100.36

* Equal to tribasic phosphate of lime (bone-earth) 89.39

† Containing chlorine 4.09

These valuable researches on the use of the mineral phosphate of lime ought to lead us to other and more varied experiments. The natural fertility of those soils in which the mineral phosphate of lime abounds would rather lead to the conclusion that, even in its apparently insoluble state, this salt is available by the growing plant, in some way which at present we are not able to clearly understand. Professor Way long since described some of those soils, which are dispersed over our island (*Jour. Roy. Ag. Soc.*, vol. ix, p. 56); and, indeed, where the tourist sees the farmers of Suffolk spreading the shelly crag (which contains this salt) in such copious dressings over their light barley-lands, and the farmers of the counties of Devon and Cornwall, in far larger quantities, employing as a manure their similarly-composed sand, such a tourist can hardly avoid the conclusion that the phosphate of lime in these dressings must constitute, in some mode or other, a considerable portion of their value.

A FEW WORDS UPON THE POTATO DISEASE.

BY A PRACTICAL FARMER.

I deeply regret that we have many unmistakable manifestations of the return of the potato-disease. For the past two years we have been wholly free from it in the neighbourhood from whence I write, but this year it appears to commence with more than ordinary rapidity and virulence. On Tuesday last, August 15th, I was examining a field of mine of twenty-four acres, an excellent crop, and all looking well. On Wednesday we had much vivid lightning, tremendous thunder-claps, followed by heavy rain. To-day, August 18th, there is scarcely a healthy plant of regents to be seen. Of flukes the appearance is much better. The haulm is only just showing symptoms of attack. On the further side of the field stands a plot of a new variety of "red regents," scarcely affected at all; and adjoining are three acres of Dalmahys, which are partially touched. In another field of twelve acres, a short distance off, are planted about eight acres of rocks, one acre of regents, one acre of flukes, one acre of "red regents," and one acre of Skerry blues. The rocks have all gone, or nearly so; the regents still tolerably free; the flukes only just showing a few decaying leaves; the red regents are nearly free; but the Skerry blues do not show any signs of decay whatever. I would observe that I am speaking of the haulm only in these remarks. The tubers in any case have not yet suffered much damage; but my neighbour, who is an extensive grower, finds many already in his fields, and to the extent of four and five at a root. In another field of mine of nine acres, lying at some distance from the above fields, I have five acres of Renfrewshire regents, two acres of Dunbar regents, both direct from Scotland; and two plots of rocks and Dalmahys respectively. The rocks are by far the most decayed in this field, and the Dalmahys look best. The regents are about equally decaying, but there are diversities in two or three instances, owing chiefly to the varieties of manures, and management applied, which at a future day I wish to recur to. At present the milder manures cause the better appearance in the crop, and have done so throughout their growth. The manures applied have been pond mud over the surface; then a dressing of fold-yard dung in ridges; next a liberal sowing of a mixture of pond mud, ditch roadings, and fold-yard manure, mixed, and decomposed by a strong admixture of lime and salt; and lastly, to this was added, in the first part of the field, 3½ cwt. of *Lawes' superphosphate* per acre, on the

next portion 3½ cwt. of best *Peruvian guano* per acre, and on the last portion 3½ cwt. of *Birmingham blood manure* (highly popular here). *Lawes' superphosphate* from the commencement took a decided lead, and has held it up to the present time, and the haulm is more healthy looking. The *Peruvian guano* has, up to near this time, been the lowest on the scale of progress; but since these rains have put in, it has pushed the haulm into stronger growth, as both haulm and leaf denote; but this part of the field shows more disease than either of the other parts. The other manure has proved well, but certainly it does not equal the superphosphate; and should the crop of tubers also prove advantageous to the superphosphate, it would suffice to show that, in this case at least, an expenditure in artificial manure in superphosphate to the amount of £1 3s. 11d. per acre is equal to the expenditure of £2 7s. 10d. in *Peruvian guano*; or it tends to prove that this particular soil is deficient in phosphates. Be that as it may, this is the state and progress of the crop under the varieties of manure, the soil itself being a mild loam of medium character. When I raise the crop I shall endeavour to ascertain the difference in tubers. But I am digressing from my intention in writing this paper. It was chiefly to suggest immediate action in stemming the disease. There are several ways of modifying these attacks. The first I would point out is to take a pair of strong horses and good moulding-plough, and mould up the crop as closely and effectually as possible, so as to prevent excessive moisture operating, or atmospheric influences to abet it. The next course to this, and perhaps a better one, is to cut off or draw up the haulm so that none is left, and then to mould up the ridge again so that no moisture or droughts can enter the ridge. This course, however, prevents the further development of the crop. Another, and the easiest course, is simply to cut off the haulm, and with it to carefully cover the ridges; but this is not effectual. In the other cases it is truly serviceable, but still not fully effective. Another course is to press the haulm aside, so that the dews and rains should deposit their moisture between the ridges; but this is a very defective way. The winds soon disturb and raise it up again "all manner of ways." Another plan is to take up the crop. This is also a bad practice. It is to no purpose to lift the crop till it is ripe and ready, as the good tubers will then soon rot. If the

skins will abide a tolerably hard rub they may do, but not otherwise; and at present this cannot be the case in a general crop. No one knows what ought to be done. The most prudent and wisest course is to wait with all patience the result of the attack. A course of fine weather will effect far more than all the skill and contrivance of cultivators. The prospect is by no means a bright one as respects the crop, but when the haulm is removed there is almost a full stop put upon its growth. It is better to wait awhile than to do this; but the exclusion of air and moisture from the tubers cannot fail to be right. Unquestionably it would be both safe and wise to lift the potato crop as soon as it ceases to grow, and the tubers denote maturity. The slight depth of covering in the ridge does not suffice as an effective protection from rain or disease. Every effort must be made to save this valuable crop, for it is not at all unlikely to be our main dependence in the ensuing winter. Meat is already selling at ninepence per pound. In face of this we have the Russian Rinderpest and a deficient harvest. Food must be dear. It may yet be imperatively necessary for the Government to forbid importations of stock, and the losses already sustained are very seriously affecting the

community. The Rinderpest is daily spreading, and removals of stock are perilous. The country is on the alert, having at last become aroused to the consequences of this tremendous evil. The idea of mutual protection or mutual insurance is all right enough, but it won't stay the infliction. There cannot be a doubt but that every animal travelling from the interior of Russia, passing through various climates, much unpropitious weather, and without sufficient food, is just in a state to take any infection, or spontaneously to imbibe one. Some regulation in this particular ought to be enforced. If the shippers cannot prove that due and satisfactory care has been taken of the stock shipped from their first stage of transit up to their landing stage, they ought not to be permitted to land. It may be hard upon exporters or importers, but no unhealthy or unduly emaciated stock should be permitted to land on our shores. A knowledge of this would soon put these classes of men upon their guard, and it would be found that but few Russian or any other stock from the interior of the continent would find their way to this country. I trust every stockowner will, if for his own sake merely, do his best to prevent the increase of this fatal disease.

IS IT A FALLACY TO FEED CATTLE AND SHEEP ON MALT?

DEAR SIR,—“Feeding cattle on malt is a fallacy.” These are Mr. Gladstone's words in his budget speech for the present year. Is it a fallacy to feed cattle on malt, may I ask? for this is a question important and interesting not only to the scientific man and the practical grazier, but to every flesh-eating individual in the country: to men with large families and scanty incomes, to the artisan and the labourer it is one of vital consequence. It is important to the scientific man, because its solution will show whether or not food that has undergone a change before being swallowed, similar to that which takes place in the digestive apparatus, is more readily assimilated in the body of the beast. It is important to the practical grazier; for if semi-malted and malted grain possess the flesh and fat-forming properties which many assign to it, a great end will be obtained. In the first place he will have, at the present price of raw grain, a commodity equal in nutritive value to the best linseed-cake, semi-malted at £4 per ton, malted at from £2 to £3 per ton cheaper. At present, the best linseed-cake as cattle food has no known equal, and with the scarcity of the natural cattle food (turnips, wurtzel, grasses, and green rape) during the last three seasons and the present one, it has maintained a price higher than bread, the food of man. Let the farmer once appreciate the value of germinated grain as food for cattle and sheep, as it ought to be appreciated, and he will have good grounds for saying to the linseed grower and cake crusher, “Unless you can supply me with the best linseed-cake at £8 or £9 per ton, I can and will do without your commodity.” Malt for cattle involves the interest of every meat-eating individual, for it is not enough to give man bread, withholding other comforts; but at the present high price of all kinds of meat, butter, and cheese, very little else than bread, beer, and water can be obtained by thousands of our fellow-countrymen. What is the cause of the present high price of meat? is a question I frequently hear asked, and it is a question I rarely hear correctly answered. It may be remembered by some who have read my letters to *Bell's Weekly Messenger* for October and November, 1863, that I there pointed out the grazier's difficulties. These had been then owing to two unfavourable seasons in the grass roots and green cole crops, and consequently an insufficient supply of the natural food of cattle and sheep; and, rather than buy artificial food, almost every grazier lessened the number of his breeding flocks, and many gave up breeding altogether. Hence it will appear that the primary cause of the high price of meat has been the failure of the natural food-crops of our flocks and herds, and the enormous expense incurred by the grazier in substituting artificial food. The hay this year is next to an entire failure.

From the thinness of the crops it has been found that thousands of acres are not worth the cost of mowing. In this neighbourhood turnips and the artificial grasses have been sown, have vegetated, and been swept away by the fly; again sown, and again swept away; and the wurtzel is a very inferior plant. These are the raw materials of the rich juicy flesh explained by “Engineer,” in a letter on “Watery Obesity,” to the *Mark Lane Express*, January 16th of this year, and which that gentleman says “costs the farmer comparatively little;” and further, he adds that “the epicurean appetite of the public is annually becoming more squeamish about the quantity and quality of fat as compared with what it was at the commencement of the present century.” Surely “Engineer” and his epicurean friends must lately have had no other meat than fat Leicester mutton. We, in the land of the Southdowns and half-breeds, have not had reason to make a similar complaint; but I am very forcibly reminded that there is such a combination of circumstances as will greatly influence the production of any kind of fat as human food, and all the squeamish public will have to find fault with will be the extravagantly high price of all kinds of meat. “Saccharized grain is not superior to the raw grain from which it is produced.” This is the sun and substance of the asserted result of the experiments carried on by the direction of the Board of Trade, and mainly conducted by Mr. Lawes, which have produced so mischievous an impression upon the minds of many agriculturists and the general public, and have been peculiarly favourable to the cause of those who oppose the repeal of the duty on malt—experiments which have given semblance of truth to Mr. Gladstone's declaration that “feeding cattle on malt is a fallacy,” and afforded some sort of justification to the determined opposition of Mr. Thompson, and others, to Sir Fitzroy Kelly's motion.

It is a new thing to feed cattle and sheep upon grain in any stage of saccharization; and at what period has anything new been introduced without meeting with opposition from the great majority of persons? Stephenson's assertion that carriages could be drawn along roads at the rate of forty miles an hour was received with contemptuous incredulity by some of the leading minds of the present century; sending messages along copper wire with the velocity of lightning, lighting towns with gas, and many other great improvements in our social system, at first were thought fallacious. The application of 4 cwt. of guano upon land, and producing an increase in weight of turnips of from 15 to 20 tons per acre, was thought a fallacy. When tea was first introduced, one boiled the leaves, ate them, and threw away the decoction; another ate the leaves dry; a third, after boiling, ate the mixture of leaves

and water with a spoon. I scarcely need remind the reader of the now esteemed value of this plant. When first introduced into Britain, potatoes as food for man were thought a fallacy; the tubers were cut young, cooked, and served at table like asparagus; the berries were next eaten, and after a variety of ways of cooking were declared "nasty things, and only fit for pigs." As with tea, so with the use of saccharized grain, the fault has been in the cooking. The material, in the form of brewer's malt (and this I have stated in former letters) is overdone, and therefore partially unfitted for use as a cattle food; but, as I shall presently show, properly-prepared saccharized grain is one of the most nutritious foods at the command of the stockmaster, and of the highest value to him in his present exigency.

Those who regard Mr. Gladstone as a prophet, those who think the malt-feeding experiments of the Board of Trade conclusive on the question, those who complacently submit to losses amongst their flocks and herds, using artificial feeding stuffs often containing 70 per cent. of impurities, and *rejecting* the more nutritious, wholesome, and cheaper wheat and barley; and those who are content to pay 11d. per lb. for common joints of meat, 15d. per lb. for chops and steaks, may pooh-pooh! and cry out "Humbug!" at what an humble individual like myself has to say upon the dietary and general management of live stock; but the exigencies of the present season have compelled not a few to listen more seriously to the dictates of reason and common sense, and thousands of sheep and lambs, and hundreds of horses, have been fed in this neighbourhood, during the past winter, upon semi-malted wheat and barley. On one farm alone, 100 qrs. of saccharized barley have been used as food for sheep; and at the present time seven sacks per week of germinated wheat and barley are being consumed on another farm, as food for old toothless crones and their lambs, and both are fattening fast. To test the comparative value of the two kinds of grain, one flock is having wheat, and the other barley; and to further test the harmlessness of germinated wheat, one shearing ram is eating a half-peck per day, the produce of five pints of the grain in a raw state, and is fattening as fast as a pig when fed upon barley meal, milk, and potatoes. This sheep is in a close shed, and during the last month has had nothing to eat but semi-malted wheat. Professor Voelcker, in a report to the Anti-Malt-tax Association, on the composition of five samples of malt, says, "Too large an amount of sugar in food, it appears to me, may probably have the effect of nauseating;" but if a shearing ram can eat a half-peck of saccharized wheat every day for thirty days in succession, remain in health and fatten, there does not appear any probabilities in the case.* Neither are there any grounds for apprehending that "malt can never be used except as a condiment, or in small quantities" (but what grazier ever thinks of using any other single kind of food to fatten an animal upon?) I am inclined to the same opinion so far as the burned porter malt is concerned; but my experiments have taught me to believe that grain, in the various forms of saccharization, is the only article of diet, with the exception of rich grass, that horses, oxen, and sheep can be fattened upon without the aid of any other food; and I will accept a challenge for any sum not exceeding £500, to fatten six oxen or fifty sheep with saccharized wheat, against any other single food, time against time, profit against profit.

White, in a book called "The Maltster," page 115, says, "To feed cattle on malt is one of the popular delusions of the day," and states that "thirty-two stones weight of barley contain 50 lbs. of nutritive or flesh-forming compound, 22½ lbs. of sugar, and 269 lbs. of gum and starch; 25½ stones of malt, the produce of 32 stones of barley, contain only 30 lbs. of flesh-forming matter, 53 lbs. of sugar, and 175 lbs. of starch. There is therefore a loss in the malting process of 20 lbs. of flesh-forming compound, and 64 lbs. of good solid fattening materials;" and Mr. White goes on to say that "the loss of weight in barley, during the process of malting, is occasioned by the rootlets of the grain feeding upon the starch when it is germinating on the floor during the sugar-forming process." And what do such gentlemen as Mr. White think becomes of the rootlets? Do they not know that they are extensively used as food for young colts, cattle, and sheep? Sir, this closet philosophy bears a striking contrast to true experimental philosophy, and to facts well known to the lowest menial on a farm.

* Professor Voelcker appears now to take a more favourable view of malt as food for cattle.

If the quality of a feeding stuff is to be measured by the weight of its different constituents in a raw state, then wheat would be placed highest in the scale; but so far from this being the case, wheat in a raw state stands lowest, whilst in a saccharized state it stands highest in the scale of animal dietetics.

I repeat here what I have said in former letters, that to fairly estimate the value of a feeding stuff it is not sufficient that it contains a large quantity of the fat and flesh-forming constituents, but that those constituents be in a form to be acted upon within the digestive organs without deranging the functions of digestion. He who appraises a cattle food regardless of a knowledge of physiology, chemistry, and the mechanism of digestion and practical grazing, is about as capable of the business as the navigator who attempts to steer a ship at sea without a knowledge of the compass. If Mr. White, Professor Thomson, Graham, and Dr. Lyon Playfair,* backed by the whole Board of Trade, may even by the Chancellor of the Exchequer himself, were to tell the stockmaster to use raw wheat and barley for feeding sheep, because they contain in this condition, as Mr. White has told us, the largest quantity of nutritive matter, I apprehend they would be answered in something like the following language: "Sirs, our labourers are almost poisoned by drinking bad beer, and do you want us to poison our horses, our sheep, and our oxen, by giving them raw wheat and barley?" Again, to show the inconsistency of taking the weight of the different nutritive constituents of raw grain as the standard of its food value, witness the feeding of two horses, one eating a peck of raw barley, the other the same quantity in a saccharized state. The former will be poisoned, and die in a few days, whilst the latter may continue to eat the same quantity daily week after week, and have no other food, remain in perfect health, and get fat.

Surrounded by numerous extensive graziers, and having been called upon to investigate diseases which have so frequently prevailed amongst the flocks and herds of this district, I feel that I can speak with some little authority upon the subject now under discussion; and it is my duty to make known the result of my experience, for the benefit of every British stockmaster at this his most difficult period. Brought up upon a grazing farm, I have from a boy had great delight in all that concerns the management of domesticated animals; but it was not until the year 1852 that I began seriously to study the diseases and general management of cattle and sheep. In the two succeeding years, 1854-5, I had awarded to me the R. A. S.'s first prizes for two essays on the diseases of sheep. To find a suitable food for a flock debilitated by disease has always been with me a serious difficulty; and during the last three and present years, with a failure of the root and artificial grass crops, this difficulty has greatly increased. Knowing that saccharized wheat and barley was the appropriate food for horses of delicate constitutions, or which were desired to be made fat for sale, in 1855 I conceived the idea of giving germinated grain to sheep; but it was not till the year 1860 that I could induce a single grazier to listen to my suggestion. In that year a noble lord in this neighbourhood, who being always anxious to further the plans and purposes of art and science, was the first to honour me with having my suggestion carried into practice, by feeding an ewe flock upon saccharized wheat. The shepherd, a fair sample of his class, was decidedly opposed to the experiment; but the steward, fortunately a man of intelligence, and showing less prejudice against new systems than most flockmasters, willingly consented to have the grain prepared, and the flock fed as directed by me. The experiment was a success, and a great success too, for "my shepherd" condescended to confess that "sprouted wheat was capital stuff for sheep, and hoped master would let him have more of it." This year, his lordship's turnip crop being a failure, semi-malted wheat and barley have again been used; the ewes eat it before lambing, during lambing, and after lambing; the lambs eat it *ad libitum*; and the fact of fat lambs being sold from this flock, from 10 to 13 weeks old at from 40s. to 44s. carries in itself sufficient evidence that the saccharized-grain system of sheep-feeding is not altogether to be pooh-poohed. Advising sprouted grain to a neighbouring flockmaster, I was told, as Mr. White

* "Barley, in the act of germinating, loses a certain amount both of the constituents which form the flesh, and those which form the fat of the animal." This was the answer of Professors Thomson, Graham, and Playfair, in 1845 to the question, by the Chairman of the Board of Excise, "Is malt superior to raw grain for feeding purposes?"

in "The Maltster" has told us, that "grain in malting loses a large amount of nutritive matter." Cotton cake, costing £6 per ton, containing 60 per cent. of impurities, was given instead; barley at that time being worth only £6 5s. per ton, and when germinated contained no impurities. The green crops were deficient and bad in quality, and the results were pitiable. The ewes lost condition, the after-birth came away dark-coloured and in pieces, many in a state of decomposition, showing a want of nutrition in the body of the ewe; the lambs died by dozens, and the surviving ones remain a most pitiable lot, worth from 7s. to 12s. each. Only compare these with the lambs the nobleman sold, 10 to 13 weeks old, at from 40s. to 45s. Another breeder had been feeding an extensive breeding flock upon germinated barley: they ate it before lambing, and until the lambing season was over, and not more than one per cent. of loss of ewes, and four of lambs, had been sustained, and up to April 17th they were as healthy, beautiful, and valuable a lot of lambs as could be produced. The shepherd admitted, the steward and the owner admitted, that they had never had less trouble with the lambs, and never a finer lot. On the above date, the shepherd prevailed on his master to use beans; and beans were used instead of barley, and the results were so fearful that I feel at a loss for words to give a true picture of the case; however, in one month the flock had been reduced £300 in value. When consulted, deaths of lambs were taking place at the rate of ten daily; and although the ravages of the disease were put a stop to by medicine and suitable diet, yet the surviving lambs were reduced to the lowest possible condition. Another flockmaster had expressed his opinion that barley during malting lost much of its goodness, and used raw barley for feeding a lot of shearing wethers, and

the loss by death of between 20 and 30 of the number was the cost of the experiment. The sheep first appeared dull, walked stiffly, the body much swollen: they staggered in walking, and in twenty-four hours were paralysed; many were slaughtered immediately when noticed ill; yet so rapid had been the progress of the disease, that the fourth stomach had become dark in colour, and softened so that the finger could be easily forced through its walls, and in some cases had burst. The bowels were similarly affected, and, to use the butcher's own words, were "rotten as a pear." In these cases neither the chemical nor the mechanical law of digestion had been fulfilled: the raw grain had found its way into the fourth, a delicate stomach, without first being ground by the teeth, and acted upon within the pouch or first stomach. There it underwent the putrefactive fermentation, evolving large quantities of poisonous gases, and the sheep died, as remarked in my last letter, poisoned by the elements of their own food.

Should any of the opponents of the use of saccharized grain feel any doubt of the accuracy of my facts, or should there be any gentleman who may be desirous of pursuing the subject, for the sake of elucidating and establishing the truth upon the question, I should be most happy to introduce them to those flockmasters in this neighbourhood who are carrying out practically the principles I have advocated. In conclusion, I would remark that the repeal of the malt duty is as much a question for the meat as the beer consumer, for until restrictions in the use of saccharized grain consequent upon that obnoxious tax are removed, the product of flesh food in this country can never be developed in proportion to the wants of an increasing population.

J. SEAMAN.

Priory, S. Wadden, June 30, 1865.

FIELD AND FERN; OR SCOTTISH FLOCKS AND HERDS; BY H. H. DIXON.— A REVIEW.

The author of the two volumes before us is already favourably known to the public by his "Druid" publications, and more recently by his Essay on Shortlorns, which gained the Royal Agricultural Society's prize in the present year. If any evidence were wanting of honest industry in investigation and extensive knowledge of his subject, we should have it in these volumes; and we are greatly indebted to the author for an excellent work on one of the most important and difficult questions which can engage particular or general attention. If any time could have been selected more adapted for the treatment of stock than another, it is a season in which we are suffering, and are likely to suffer, from the high price of provisions. Causes of various kinds have combined to produce this effect upon articles of necessary consumption. It is unfair to saddle upon any one cause, be it unusual drought, or murrain, or increased consumption, that which arises to a certain extent from many causes; but of one thing we may rest assured—that he deserves well at the hands of all men, be they producers or consumers, who calls attention to the improvements which have taken place, or points to any means which may be used for increasing those necessary articles of daily consumption—the Leef and nutton of these islands. The exertions of Mr. Dixon have been well directed. With a natural apology for frequent, but not vain repetitions, the author promises an occasional break from the higher subjects of his investigation, into the more lively themes of horseflesh, salmon fisheries, dogs, and game. This promise he has amply fulfilled; rendering his volumes, "North" and "South," as interesting to the general reader as they are important to those more particularly occupied in the business of agricultural life. His book is interspersed with anecdotes of men and localities sufficiently well known to most of us; and they are told with a vigour and raciness which proves his own intimate acquaintance with the subjects and his love for the labours he has undertaken.

The original intention of the author, like all other original intentions which are worth anything, seems to have been much modified by circumstances. We have all heard of the Irish gentleman who set out with a small carpet-bag and one change of linen for a short visit to his friend, and who was found in the

same place, a welcome guest, at the end of three years, with an increased stock of linen and the same bag. Mr. Dixon's first idea was a modest one—"his pleasure in the Scottish woods three summer months to take." The serious task which grew out of this pleasurable excursion "plucked the heart out of" three summers, a winter, and a spring, with about 8,000 miles of travelling, and two hundred and fifty nights away from home. The information which was collected in this extended survey of Scottish flocks and herds filled two fat note-books to the brim, and must have resembled the stalling of the new linen into the Irish gentleman's original carpet-bag, if, indeed, that eccentric visitor has ever taken his leave. It is beyond the province of a reviewer to substitute his rapidly-stored fragments for the hard, well-digested matter of the author. It is unfair upon the writer, and upon the public. In the present instance it would be impossible to do so; the book will speak better for itself than we can for it. It is rather our office to whet the appetite far more by giving only such a general outline of Mr. Dixon's investigations as will show how really valuable his labours have been, and how much real information may be acquired by a careful perusal of "Field and Fern" with other sources of similar knowledge.

Perhaps no country has improved so rapidly, and attained such well-deserved repute, in agriculture and the breeding of stock, as Scotland. It presents itself to the inexperienced as full of natural difficulties and inadaptation for the purpose. Its character is one of presumed barrenness in many parts; and to English ears it sounds only as the Eden of the most enduring sportsman. Who that had no personal experience of the fact, and was ignorant of the names of Boswell, McCombie, Douglas, Grant Duff, of the Dukes of Athole and Richmond, Lords Kinnaird, John Scott, and Southesk, of Smith of Deanston, and many others, could conceive the efforts that have been made in the last five-and-twenty years to improve the breeds of native cattle and sheep, to drain successfully the unproductive lands, to reclaim the waste, to improve the fertile, and to plough and plant the "barren muir" for the benefit of mankind? Deer forests and grouse hills remain for the sportsman: the river and the loch still yield their silvery products to the fisherman in greater abundance

than of yore. They who participate in these pursuits have nothing with which to reproach increased civilization; and tens of thousands owe a debt of gratitude to the names we have quoted, for the more valuable supplies which have advanced to meet an ever-increasing demand.

When a man travels for his own pleasure there are many modes of locomotion open to him. In certain countries we advocate a knapsack and double-soles, as being the only means of enjoying its beauties; in others, a horse and saddle-bags, posters, or the rail, as the ease may be. To a man of strong nerves, the transit from Bellinzona to Atoni may be accomplished with much satisfaction in the *coupe* of a diligence. When, however, the pleasure begins to assume an air of business, and the *voyageur* has laid upon himself a certain necessity, we hardly see how Mr. Dixon's plan could have been improved upon: he decided against walking, and very properly. If the body be fatigued, it is almost impossible that the mind can work successfully. The very anxiety to be at the end of a tedious journey militates against the due digestion of the information we have obtained, or (to speak metaphorically) of the aliment we have been laying up in store. He judged wisely, in a country like Scotland, when he decided upon a hack. To a man accustomed to the saddle the fatigue counts for nothing; and the advantage of pushing on as occasion offers, of getting off to walk, of transferring yourself, your hack, and your baggage to the boat or rail, if necessary, speak volumes in its favour. But let the inexperienced beware of any such temptation as the author's success holds out: he will assuredly repent him of his temerity; and when he has lost his time, his leather, and probably his horse into the bargain, he will find that a ride on an unconditioned Galloway from Caithness to Kensington is no joke. Mr. Dixon is sufficiently modest usually in speaking of himself and his exploits, a virtue not found in every journalist; but he is fully justified, as claiming some merit for sitting "three-quarters of an hour at night on a corn-bin, to be sure that the ostler does you justice": to say nothing of having "to blindfold and stuff the ears of your mare, and twist her five or six times round to make her forget which way you wanted to go, when you found a Lanarkshire or Ayrshire blast furnace roaring like a lion in your path, late at night, between yourself and your inn."

Certainly the undertaking to which he committed himself was no light one, and the *modus operandi* quite unfitted for any feather-bed excursionist.

The Scotch themselves are a pleasant and hospitable people to travel amongst; and the kindness with which our author was received, and the readiness with which information on his favourite topics was supplied, speak well for both parties. Still, even here there are certain difficulties to contend with, not so common in a country where the dialects are more familiar to the ear. Gaelic to a Southerner is embarrassing, to say the least of it—doubly so where accuracy of name is required; and we believe that few men would have cared to enter upon so peculiar a study as that of a Gaelic dictionary. We have before said that Mr. Dixon offers an apology for the dryness of his matter; and there can be no doubt that he has a right to have his claim allowed, when "ewes and widders" are compelled to form a foreground for his picture, instead of the joys and sorrows of human beings. It is true, however, that we give the reader some limited insight into the method and detail of the work itself.

Mr. Dixon, starting from Aberdeen, describes the incidents of a very unpleasant voyage, as we all know, up to the Shetlands. Here and in the Orkneys he finds ample scope for observation. He does not appear to have been bitten with the mania of Sir Henry Dryden, or to have indulged in his taste for ecclesiastical architecture, but to have gone at once to his business in hand. The cows we may leave to speak for themselves, or, rather, we recommend the reader to the pages of "Field and Fern." It was, however, impossible to pass through such a district without a word upon horseflesh; and we have consequently a very interesting description of the ponies. Instead of carrying peat, as heretofore, they have been sent annually in numbers of from three to five hundred, to the pits. The sum of £5 10s. is said to have acted as a lure to the breeders, who have furnished of late years the Northumberland collieries. The drain upon the Shetlands accounts for a smaller supply during the last few years. The dealers' purchases, however, have during the last two summers fallen off, and have given a new impetus to the breeders. Northumberland employs the

greatest number of Shetlands, while Durham gives the preference to the Welsh. The fact is that size and weight in the collieries must tell. Men soon discover that the saving of outlay is a false economy, unless the work required is effectually performed; hence the crosses, to produce size. It is said that breeders are too indifferent there, as elsewhere, to the points of the sire. The probability is that half a loaf is better than no bread, and they take what they can get.

While on the subject of ponies, one thing is worthy of remark: we scarcely ever saw, and never had, a thoroughly bad one. They are usually enduring, usually sound, and capable of performing journeys (due regard being had to pace) to which the capability of horses bears no comparison. Many of these animals, of which the author speaks, live, more or less, entirely underground. It is no uncommon thing for them to pass four or five years deprived of daylight—some that he mentions exceed fourteen or fifteen years in the pit, and one has been a subterranean labourer for at least twenty. When we add that an average day's work is some twenty miles (half with empty tubs), we need not advert to the fact that their fodder is of the best, and most abundant. These islands are said, too, to excel in the quality of their wool, and on each sheep there are three kinds or qualities: the first quality adds to the comfort of our women in the form of veils and shawls, the latter of which can be drawn through a wedding-ring; and the other sorts make stockings of various substance. The manners, indeed, of the producers are not first-rate; for, like our Welsh friends in the midland counties, they can scarcely ever be considered as positively safe till they make their appearance upon the table.

The journey from Tain to Inverness, taken as it was at leisure by the author, presents some interesting features connected with shorthorn crosses and the rearing of calves. No truism is more thoroughly impressed in this county than the fact that you "must feed from the starting-post." There is great truth in the aphorism that all "the goodness of young things goes in at the mouth"; and whatever pains may be taken in breeding cattle, be it of whatever kind it may, they are all thrown away unless the rearing of them go hand in hand with it. Our author has not forgotten, in speaking of colour, the old Scriptural account of the force of external impressions, and he relates two very striking anecdotes on the subject. We shall allow him to tell the story in his book about the strange cat and the still stranger marks on the bullock, and the dog which chased the cow about the meadow, and had the satisfaction of welcoming a calf which corresponded to him "with photographic accuracy." In one point we can experimentally bear testimony to the observation of Mr. Dixon—that a yellow skin (and especially about Alderney and Jersey cows) denotes a well-filled pail.

In speaking of sheep farming, it would have been difficult to have avoided the *vexata questio* of heather burning. We have no desire to be put down as of either side—with the sheep or with the grouse; but there is no doubt that means may be found to reconcile the interests of both parties, and that the permanent advantage of the country will depend upon it. The fact is that sport, and everything connected with it, has now become such a "furore"—men are so capable of paying for their pleasures, and so happily inclined to those which have a healthy and vigorous tone, that we have no anxiety to thwart their wishes or injure their interests. We believe the two may be made, if not coincident, at least unantagonistic; and if Mr. Houston's rotation system of cutting the heather into squares, with considerable drainage, be found effective, we should certainly recommend its adoption. Men *must* have mutton and they *will* have moors—"the moor the merrier," as a friend of ours observed on an occasional visit to Scotland; but we never desire, with all our love of sport, to see the necessities of life sacrificed for selfish interests or pleasures. To possession are attached immense responsibilities; and an accusation has been made of late years, against Scotch proprietors, of excessive avarice. The national character stood in need of no such counterbalance to its proverbial hospitality; and the robbing of Peter to pay Paul is a mark neither of wisdom nor morality. Every man has a right to do what he will with his own, conditionally that he does with it no wrong—a truth worth studying by the owners of certain mysterious "flyers" on the turf; and it seldom happens that national prosperity is advanced by individual cupidity. The rich man wants grouse, and the price he offers for them will command a supply; but the poor man wants mutton, and as he can only afford to

give a moderate sum for his necessities, the country should be permitted to carry at least its due proportion of sheep. It is to very little purpose that crosses between Scotch sheep and Leicesters or Southdowns receive so much attention if the improvement in size or quality is met by a deficiency of supply.

Mais revenons à nos moutons, and leave those of the Scotch lairds for the present. Dunrobin calls out the author's national taste for sport, increased as it is by the sight of Purday's and Lancaster's deer-saddles, and the details of hill craft in the Duke's gun-house; and the poetry of his nature is let loose upon the beauty of the dairy, by the ribbon borders "of pink saponarium, white nemophyllia, blue salvia," and other flowers which "run coyly from the Castle gardens to the sea." The Duke's piper, too, comes into the picture, not so much for his talents as a musician as for his costume, Highlanders being as uncommon north of Inverness as they are common between Temple-bar and Nottingham, or on the sands of our fashionable watering places. Inverness and the claims of the Highland Society give Mr. Dixon a proper occasion for a good spell upon cattle. No man knows better how to make use of the opportunity. We will not rob him of the pleasure and profit, nor inflict on the general reader the pain of going through the Belvilles, the Charlottes, the Druids, the Hanton's, the Fair Maids of Perth, with all the other prize-winners and "Black Venuses" enumerated by our author here and elsewhere. We refer the enthusiast or the sceptic to his pages for gratification or conviction of the immense attention that has been given to the subject by our North British neighbours. Those accounts will be found to be interspersed with amusing anecdotes of the breeders, and with salient remarks on the peculiarities of the people; and we cannot help adding, for the benefit of others who may come after him, that from beginning to end there is not one word of ill-nature or one single breach of confidence. The gentlemen who have trusted Mr. Dixon will have no reason to repent of their confidence; and although a work of this kind must have depended for its accuracy and interest on the amount of intimacy which the author has been allowed to cultivate in certain quarters, although he may have been tempted by an appreciation of humour, which is manifestly one of his qualifications for popularity, and although the Scotch character presents as many peculiarities to an English mind as any other nation under the sun, there is scarcely a word in the two volumes which, on that score, we would desire to alter. We hope this is high praise: we mean it to be so; for the miserable instances of a contrary policy are sufficiently numerous among literary men, and we can conceive nothing so degrading to the profession.

We are glad to find a word for the Gordon setters. They are all at the Castle—"black-and-white, with a little tan on the toes, muzzle, root of the tail, and round the eyes." The late Duke is said to have preferred it for an excellent reason—the facility of seeing them on the hill side. They are described as "light in frame and merry workers." We only hope they have plenty of opportunity of displaying their qualities; for one of the most melancholy deteriorations of sport in this country is in the indifference to a good dog, and the ordinary employment of none at all. Retrievers, to be sure, are, like every dog, having their day; but such setters or pointers as we shot to twenty years ago seem to have gone out altogether. There is also a curious account of a cross with a remarkable sheep dog, taken from the *Field* newspaper. Whether well authenticated or not, we are unable to say; at least there is nothing so extraordinary in the fact as that of the Duke of Gordon's own fancy for a cross of the kind. We have seen plenty of bob-tailed pointers, in many parts of England, and all over Germany, which might have been called anything, but which went under the name of sheep dogs for the convenience of the pot-hunters and to the detriment of the Queen's Exchequer. An entertaining chapter is devoted to the late Captain Barclay, the great pedestrian, and the trainer of Cribb for his fight with Molyneux the black. We remember to have heard or read of the way in which he walked away from the post-chaise on his road to London, until the postboy and his pupil began to think they had lost the Captain altogether. His view of a country seems to have been that of Lord Cardigan, whose practical eye saw little else upon the Limekilns at Newmarket, though surrounded by the "cracks" out at exercise, than "a splendid place to manoeuvre cavalry." His Cicerone at the time, a friend of our own, takes a totally different view of the value of the neighbourhood of Newmarket, and sees more in a

Derby winner or a candidate for the St. Leger than in all the squadrons of cavalry in Great Britain. Captain Barclay was impressed with the value of "Moss Paul," as a place "to train a man" instead of a horse. The last of the Captain's line, who goes as often by the name of "Allardice" as anything else, is now in the Army, having passed his examination under the auspices of the author of "Charlie Thornhill."

In the same neighbourhood figures the well-known name of Boswell, the highest example of an improving proprietor. Not a Mechi, but one of those simple, substantial pioneers of agriculture, who set an example of economy and discipline to their tenants, instead of creating a jealous and impracticable class of farmers, who would willingly be gentlemen if they could only afford to be idle, and who never understand the difference between improvement and expense. Cortachly is connected with the name of Airlie, the present representative of which family having created for himself a respectable claim to some distinction in the House of Peers, is happy in passing a fair proportion of his time in the improvement of his estate. This is done under the superintendence of Mr. Peter Geekie, Lord Airlie's factor, and has more regard to the laying down of a permanent pasture in the midst of country said to be short of grass. The Piper is not forgotten, and Lady Airlie's dairy-farm comes in for its meed of praise. Dr. Murray, of Carnoustie, and the ups and downs of "The Cure," will delight the racing man; for if the generality of Scotchmen north of Perth are somewhat indifferent to the charms of the turf, the Doctor made up for the deficiency. We didn't know the exact value of speculation in thorough-bred stock, till we ascertained that the price paid for the horse that was second to Voltigeur in a field of sixteen sires, for the prize at Middlesborough, was 7s. 6d. As Mr. Dixon justly observes, "there must be some virtue in medical attendance, or in Carnoustie air."

In order that nothing may be wanting to make the book readable, we have a full account of Mrs. Blair and her poultry-yard, her baskets of rissoles, her Indian corn, and her enthusiastic superintendent "Annie." She has birds of all sorts, each one the best of his or her kind, and, whatever may be the state of the debtor and creditor account, she rivals the celebrated Mrs. Howard in her care and attention to her work. That lady, we believe, made several hundreds of pounds out of a pair of Cochon Chinas, which came originally as a present from a grateful schoolboy, to the late Mrs. Peel, the wife of the Dean of Worcester.

Perth and Dunkeld are rich in legendary lore of shooting and racing, and the account of the Caledonian hunt, with its Ayr, Perth, and Kelso meetings; its Ladies and its Lords Eglinton, Mansfield, Stormont, Tweeddale, Glasgow, Wemyss, and Moray; its Whyte Melville, Little Gilmour, Sir David Moneriffie, Alexander Ramsay, Sir David Baird, Sir John Maxwell, and the Duke of Athole, with hundreds more who have lived and died since 1777, the date of the establishment of the Club, make up a most interesting chapter, which it is wicked to forestall. Paton, the gun-maker, finds a niche as well as others, and deservedly so. He enjoys the confidence of some of the best shots in England; amongst others that of Lord Stamford, who two years ago had shot with no other guns, and had not yet been tempted by a breech-loader. Since then he has given way to fashion or conviction: with what result we know not.

The hunting of the north, whose division from the south is the Frith of Forth, is admirably summed up by the description of the Fife kennels. Those men who have known the Athirstone formerly, and who have made a renewed acquaintance with the Pytchley during the last season, will be glad to hear of Mr. Anstruther Thomson's success in the north. It must be a vastly different country from that *through* which we have not unfrequently followed the gallant master. We say *through* advisedly, for Mr. Thomson's weight would scarcely allow so hard a man to go *over* a country so big as those in which we knew him as a rider. Whatever the deficiencies of country, however, we are well assured that it has difficulties of its own, more formidable in some respects, and of infinite value for making hounds—a consideration more in accordance with a sportsman's views than for breaking horses, a purpose to which the Athirstone and Pytchley countries are too frequently put by rash young men. Other hunting has its representatives and frequent mention in both volumes; and if we were asked to select a chapter full of racy incidents, and

calculated to wake up a mind wearied with a trifle too much beef and mutton, we should recommend a perusal of the visit to Dr. Grant and Sandy, on the road from Coldstream to Hawick, in the south. We have heard of a night w/ Burns, and we have strong impressions of many pleasant ones with hundreds of choice spirits; but for a gentleman with a taste for Dandie Dimmotts, badgers, ferrets, rats, vicious horses, and for rough practice of every kind, medical, cynical, and zoological, we should say a morning with Dr. Grant and his otter hounds, Robin, Walter, and Ringwood "the biggest black-guard of the lot," would be just the thing. As to giving any sort of idea of the Doctor's establishment in a review, which our space warns us must soon come to an end, we dare not think of it: the bits are so good that we can scarcely make a selection, and then feel it would be unfair to do so. Let the reader search for himself. We can guarantee him a hearty laugh over the eccentricities of the Doctor and the "happy family," of which he himself is the showman and the nucleus.

We seem to have said sufficient to explain the method and the matter of these volumes, and to recommend a perusal of the originals. Space forbids us to do what we fain would do, viz., extract a few of the anecdotes with which the driest matter is interspersed. Nor is it necessary to treat the south of Scotland with further notice than to say that it is as honestly and industriously handled, and entirely after the same fashion, as that part north of the Forth, which we have more elaborately specified. There will be found ample food for the lover of the leash, among the lowlanders. Edinburgh appears, to the abstraction of its picturesque beauties in these pages, as a great emporium of wool. The steam-plough and the fine arable land of the Lothians come in for their due share of attention. The crossing of Downs with Dorsets and Leicesters, and Mr. Douglas and the Athelstaneford herd, (upon the relative merits, as well the demerits of whose bygone cracks, their owner, who is second to no man in the United Kingdom as a judge, here makes a clean breast) are given somewhat in detail; and the remarkable "dodges" of the showyard prove that the Ayrshire men are as wise in their generation as a Piccadilly dealer. The Eglinton tournament, and the athletics of the late earl and his successor, occupy a few pages; and the book winds up with a short description of one of the nastiest rides through frost, rain, and eventually snow, through a country with which we are well acquainted, to Kearsington. We presume the "garron" was not quite the thing for the Quorn, Mr. Tailby's, or the Pytchley pastures

around Sir Rainald Knightley's at Fawsley, or Mr. Dixon could hardly have resisted the temptation of a thaw.

The two volumes are illustrated by steel engravings of the late Duke of Richmond, Mr. Hugh Watson, late of Keildor, Professor Dick, and Mr. Nightingale, who was, until his retirement from ill health in 1860, the most popular coursing judge in England and Scotland. Thus sheep, cattle, horses, and greyhounds have each their special patron. There is also a spirited sketch of the head of the prize West Highland bull Duntroon, drawn on wood by Mr. Gourlay Steel, R.S.A., the animal painter to the Highland Society. The camera has been called in twice, first for an interior, in which Dr. Grant, "Sandy", Ringwood, Pibroch, "Shammy," and a dead otter are grouped together; and again for "A Scene at Knockhill." The latter really embodies "The Turf, the Chase, and the Leash" of Scotland. Mr. Sharp was secretary to the Caledonian Hunt Club for a quarter of a century. The white horse Pallinsburn was one of Earl Wemyss's best hunters for four seasons; and the greyhounds Carl Time and Tak Tent are no unworthy representatives of Scottish "long-tails." Still, the author is nowhere to be found among the illustrations. An old groom once asked an artist rather testily why he wasn't in a hunting picture; and that gentleman soothed him by saying, "You are. Don't you see that hill? You're coming up the other side." By this rule Mr. Dixon is in the preface. We find a woodcut of his mare Cockade, all accoutred with pad, book-bag, macintosh, and valise ("just fifteen-four the lot," as the worthy Dumfries bacon-dealer observed who weighed them); and her rider is no doubt taking notes in the cow-house, to whose door she is tied. This is at least a fair suggestion.

We have one word only of censure, and we are sure it will be well taken; for the fault is far too common amongst the writers on agriculture and sport throughout the kingdom. The general interest and utility of the book is somewhat lessened by the assumption of the author that the whole world is as well acquainted with places, people, polled cattle, and prize bulls as himself. In sport, this has amounted to a vulgarity of diction as common as it is incomprehensible. In agriculture and ordinary matters it leaves a blank upon the mind of the reader, which nothing but oral explanation can fill up. To persue well "up" in the subject this is unimportant; but it should always be borne in mind that one of the duties of an author is to render his subject popular, and then to elucidate it with that clearness which a popular subject deserves.

THE SUMMER HOUSE-FEEDING OF DAIRY-STOCK.

In a former paper attention was drawn to this important and interesting subject, by showing the results attainable from a well-managed dairy-stock, by full feeding, good management, patient and never-flagging perseverance, and the most constant and untiring attention to the minutest details.

It is now proposed briefly to notice the breeds of cattle most suitable for dairy purposes, and the crops that can be grown by the farmer pursuing a system of fixed husbandry, with most advantage for the feeding of his cattle during the summer and autumn months. Keeping in view the principle that a milch cow requires full feeding during the whole of the milking season, these hints are given to draw attention to the providing of extra food at a time when dependence is apt to be placed solely on grass.

The pastures, as everyone knows who is farming light land, are often a very fluctuating source of supply; a fortnight of dry weather in May or June may so burn up the grass as to materially injure its growth for the remainder of the season. It becomes, therefore, the interest of the stock-owner to provide such food as will make him, in a great measure, independent of the season, and enable him to keep his cows in full profit and in good condition, whatever should be its character, whether wet or dry.

Getting into dairy-stock requires a considerable amount of care and attention—as to the breed most suitable for the land on which they are proposed to be put, and the situation of the land, whether high or low, exposed or sheltered; as a very

slight climatic difference exercises a large amount of influence on such a sensitive animal as a milch cow.

Choice having been made of the breed, it will well repay the intending purchaser to exercise a little care, and go to some extra trouble, and even expense, for the purpose of procuring animals from an inferior soil to his own, as such animals, if of a good sort and well bred, will at once begin to thrive, and before they have been many months on their new pasture will exhibit a marked improvement in condition and produce. If the contrary course has been pursued, and fine-looking animals from a superior soil and it may be climate, have been purchased, deterioration is almost sure to show itself, which will continue until the cattle have been reduced to the size and condition at which the land will maintain them. Where house-feeding is carried out with regularity, this difference will not, of course, show itself quite so decidedly; still this is a point which will, under any circumstances, well repay a little attention and consideration on the part of the farmer.

The large graziers who supply the metropolitan and other extensive markets are well aware of this tendency in cattle to improve or deteriorate when changed from their native soil, and prefer stocking their pastures with well-bred healthy animals, purchased from breeders occupying land much inferior to their own.

So great is the tendency to improve, shown by cattle removed from middling soils to those of first-class quality, that, after being from two to three months on such land as the rich

feeding grounds of the English midland counties, the vale of the Clyde in Scotland, the golden vein in counties Tipperary and Limerick in Ireland, their former owners, if happening to see them, have the greatest difficulty in recognising the animals they themselves had reared.

A great matter in the selecting of milking stock is procuring them from herds of known superiority in milking qualities. In the case of pure breeds, this can be done with comparative ease, as in most districts there are herds celebrated for the abundance of their produce, the young and surplus animals from which being obtainable at somewhat higher prices than the average value, on account of the celebrity of the parent stock.

In the absence of such opportunity, recourse must be had to the fairs and markets of the neighbourhood. In the case of gentlemen stocking, or even extensive farmers, it is mostly better to purchase from a respectable dealer of known character for probity and straightforward dealing. No one could possibly object to pay a dealer worthy of confidence a pound a-head profit: and it will invariably be found that it has been twenty shillings remarkably well spent. On consideration, it is hard to say whether it will be spent at all, as a man who is at every fair within his reach, for the purpose of purchasing and disposing of stock, becomes such an adept that he will pick out the animals suitable for his purpose, and have them bought, while the man who is only occasionally a purchaser would be only in the act of searching for them. Sellers have commonly much less hustering (to use a common phrase) with a well-known dealer than with a stranger, or a person whom they know is not very well acquainted with the value: and thus the dealer has a double advantage.

If purchasing at a time when distemper is prevalent, it is a very safe thing to purchase through a dealer, as he, being aware of who has distemper, and even knowing the neighbours of those who have it, he will, careful of his own reputation, have nothing whatever to do with their cattle.

No dealer of established character will knowingly buy animals from a tainted herd, however great may be the temptation in the way of profit; and that very fact ought to be an inducement to tenant-farmers and gentlemen-farmers alike to give the dealers more encouragement than they usually do. They are a shrewd, indefatigable, and hard-working class of men; and by penetrating into the remotest districts, and even travelling from farm to farm, form a connecting link between breeder and feeder highly useful, perfectly natural and in an eminent degree favourable to the interests of both parties.

Next to providing plentiful supplies of food, probably the most important matter to be attended to is, the buying cows that, from their form, general appearance and descent, will have a good prospect of turning out good milkers.

The season may be an unfavourable one, and the hay be spoiled or much injured; it may be a dry one, and the grass consequently bad and the turnips inferior—these can all be borne and with patience too, as they are absolutely unavoidable. But when a stock-owner has been fortunate in his endeavours to provide good hay and plenty of it—turnips and other food all right both as to quantity and quality—there is scarcely anything more intensely galling, and the memory of which will stick longer to him, than to find, on balancing his books at the close of the season, that he has been putting all his carefully and expensively-raised food into bad skins; in short, that he has taken his goods to an unprofitable market.

In selecting a milch cow, the best judge will at times be deceived; as a cow of very promising appearance, coarse, thick-necked, and big-boned, will often be a prime milker, while a cow of the most approved form will now and again prove so worthless as not to be worth house-room as far as her milking qualities are concerned.

Whatever the breed of cattle, it will generally be found that cows with the following characteristics moderately well developed will have a good chance of turning out good milkers: The head light and long, forehead broad, horn not too thick, but clean, and in some breeds waxy (as the shorthorn for instance); the eye clear and rather prominent, neck rather thin, forepart light, back straight, broad over the loins; ribs well sprung, and the carcass deep; bone not too heavy; udder nicely formed, well forward, with skin soft and elastic, the paps well set out from each other, and neither noticeably large nor yet inconveniently small; lastly, the tail of a good milk

cow is nearly always long and thin, almost whip-like in its appearance.

It is worthy of note that the influence of the bull on the milking properties of his progeny is very considerable. So well is this understood in Lanarkshire and other districts where milk alone is the object of the farmer, that much trouble and expense is gone to, for the purpose of procuring a bull from a herd of admitted excellence. No matter how diminutive he may be (and to the eyes of those accustomed to short-horns or other large breeds, Ayrshire bulls look particularly so), if he is out of a milky stock the object of the purchaser is gained; and much praise is frequently lavished on a two-year-old animal, not much bigger probably than a shorthorn calf of six months.

There are many useful breeds of cattle in the three kingdoms, some of them but little known outside the county or district whence they derive their distinctive appellation, but still worth adhering to and keeping pure for some quality peculiarly their own—feeding it may be, dairy purposes, or labour. Amongst those breeds chiefly reared and kept for the production of beef, the shorthorn, Hereford, and polled Angus hold a very prominent and deservedly high position. Each breed has its supporters, many of whom have attained a world-wide fame; and certainly the style in which they turn out their favourites, whether to the show-yard of the Agricultural Society or consigned for sale to a London salesmaster, does them infinite credit.

Although amongst these breeds a good milker is by no means rare, and even in an exceptional herd the milking quality may be found well developed, it is not pretended by their most ardent admirers that they would suit in their purity to be kept solely on account of their milking properties, and would make profitable dairy stock. Had they no other property, however, than early maturity and heavy weight, they would for that alone be invaluable. Of late years, the shorthorn has been the favourite, and the blood of that breed has spread with wonderful rapidity, not only in these kingdoms, but on the continent of Europe, America, and Australia.

The improvement effected by the infusion of shorthorn blood in Ireland alone during the last few years is most gratifying to all the well-wishers of that beautiful country. Twenty years ago, and even less, the fairs were filled with gaunt and scraggy animals, with long horns and coarse, thick hides, narrow over the loins, the rumps light, being mostly drooping, while the tail stuck up like the keel of a boat. Now the same fairs are well supplied with beautiful young stock, straight along the back as a gun-barrel, presenting, if it were only in this respect, a marked difference to the cattle of former years—handsome in their general outline, and particularly so in the set and appearance of the horns and marking of the skin.

Immense numbers of young cattle are shipped weekly for England and Scotland, the receipts for which form a large, and, of late years, one of the surest sources of revenue of the Irish farmer. A most significant and gratifying fact in connection with the Irish export trade in cattle was the presence at the recent Falkirk tryst of such a number of Irish cattle as to constitute the staple of the largest August market that has been held on that stance for the last ten years. A very few years ago Irish cattle at these markets occupied a very insignificant place, the large buyers scarcely deigning to look at them, and the farmers of the neighbourhood openly scouting the idea of purchasing them. As already stated, the large infusion of Shorthorn blood that has taken place during the past few years in Ireland has been the chief cause of the pleasing results now mentioned.

Of breeds in general use, and of acknowledged merit for dairy purposes, are the Dutch, Shorthorns, Crosses, and the Ayrshire. Dutch cattle are of large size; prevailing colour black, with sometimes a white patch over the back, resembling a sheet and are, from this, distinguished by the name of sheeted cows. They are heavy milkers, but the milk is of rather poor quality, and not very productive of butter. For this reason they are more suitable for parties who have large contracts and supply work-houses, prisons, hospitals, and other public institutions with milk, than for the ordinary farmer who has to manufacture his produce into butter and cheese. Another very serious objection to Dutch cattle is the difficulty of fattening them when past their prime, and the large quantity of food they consume in the endeavour to prepare them for the butcher. On account of these two faults in the character of

this, at one time rather popular breed, they have of late years been going down in public estimation. There are a few districts where they are still to be found pure, and there are county agricultural societies that still reserve a section for Dutch cattle; but the entries are yearly getting fewer, and will in all probability shortly cease.

Of all other descriptions of cattle, Shorthorn Crosses are now the most popular, where dairy business and rearing and feeding are carried on simultaneously. They are, for the most part, admirable milkers; their calves, both heifers and bullocks, can be fed-off at an early age, and, coming to heavy weights, bring large and remunerative prices: while the cows themselves, when no longer useful for the dairy, are easily fattened, and can be quickly got rid of. In the three kingdoms, but more particularly England and Ireland, this variety of cattle is to be found in every county, and on every kind of land, varying in size, of course, according to the quality of the land. The same distinctive features are, however, always retained, and they attain an immense size, and give extraordinary quantities of milk, where the soil is rich and the climate congenial to their habits and constitution.

The Ayrshire next claims attention; and it may be concluded with safety that when dairy produce is the sole object, and where the land is light and of indifferent quality, this breed is the most valuable of any. Mere size in this case is not much of an object, as the small Ayrshire is considered a better dairy cow than the larger or medium sized variety. To keep them small in size, and partly to adapt them to the inferior pastures of Ayrshire and neighbouring counties, they are very moderately kept in the earlier stages of their growth, particularly in the second year. This is supposed to add to their milking properties, and as they are generally made to produce at the age of two years, an Ayrshire cow on her native pastures is usually very small indeed. When removed to other countries, and placed upon richer pasture, they grow larger; but by doing so, the milking powers are unquestionably injured. So marked is this principle, that the Ayrshire cow is seldom found in the same perfection, as a milker, as she is to be seen on her native soil, which may be said to comprise the county from which she derives her name, and the adjacent counties of Lanark, Renfrew, and Dumbarton. There she takes her position as the dairy cow *par excellence*, and is highly and deservedly prized.

In these counties dairy farming pays well, the farmers having such a ready market for their products amongst the large mining and manufacturing population of Ayrshire, Renfrewshire, and Lanarkshire, and on the opposite side of the Clyde, at Dumbarton, and at Helensborough, and other watering places on the Gare-Loch. In all these districts the price of milk and fresh butter is always very high, giving the surrounding farmers the advantage of being able to extract the largest return obtainable from a cow in any part of the kingdom.

If the returns of an extensive stock-owner in Ireland were compared with those of a middling farmer in Lanarkshire, who sends his milk into Glasgow every morning, it would probably be found that the latter was just about double the former; this result aided by good feeding, but mainly due to the difference in price obtained for the produce. This alludes of course to the large inland stock-holder, who has no other way of disposing of his produce than by making butter for the large markets, and feeding pigs with the milk. In the neighbourhood of Belfast, Dublin, and Cork there are dairy farmers who understand the feeding of a cow right well, and make an extraordinary sum per cow per annum; but they have not the dense population to supply that the farmers in the districts above-mentioned have, and therefore they never can attain to the same aggregate receipts.

To all farmers residing in the vicinity of large towns, a supply of house food is mostly attainable from the breweries and distilleries during the entire season; for although they may not be at work always, yet by storing the grains and treading them down in pits, so as to exclude the air, they form, after undergoing a slight fermentation, almost better food than when fresh from the brewery. Large returns are made from the use of this food; but from the almost periodical visitations of distemper that occur when grains and wash are largely used, the profits come in the end to be considerably reduced. Overlooking this rather serious objection, it is quite evident that, although they were desirous of doing so, the majority of farmers are so situated

that the getting of such food for their cattle is simply an impossibility, and must therefore, to obtain a supply of house feeding for the summer, cultivate such crops as will come on in succession to be ready when the turnips and mangolds are finished in the spring, and continuing on during the entire summer and autumn, until the Grey-stone, Pomeranian, and other soft turnips are available to take their place. When milking cattle are highly fed, and means are used to extract the utmost amount of produce that they are capable of giving, experience shows that there is considerable advantage in varying the food as much as possible. If one description of food is constantly used, the cows tire of it, and do not eat it so greedily, and by-and-by an unpleasant and unexpected reduction in their productiveness is experienced. It is quite possible that the novelty of a change of food acts as a stimulus to the whole system of the animal, and promotes the secretions.

Amongst the crops that can be successfully and profitably grown for the summer-feeding of cows; cabbages, Italian ryegrass, clover and tares or vetches are the most prominent and most useful. Sainfoin and lucerne are also valuable plants for green fodder, and on certain soils and favourable situations give a large amount of food. The cultivation of these plants does not, however, seem to be extending; and it would be very difficult to bring them into general use in the three kingdoms. At present their cultivation appears to be confined to England, the chalky soils abounding there suiting the sainfoin particularly well.

Cabbages are an excellent food for milk cows, and by regulating the sowings, they can be had for a lengthened period of the year. This plant being a gross feeder requires abundance of manure; without therefore giving it a plentiful supply, there is no use in attempting its cultivation. By deep cultivation and liberal manuring, cabbages can be grown to the extraordinary weight of 30 lbs. each. The weight per acre is enormous, and the return to the manure heap is correspondingly large. This valuable plant has not taken the position as a field crop that it deserves, few farmers having an extensive break of cabbages. This is probably owing to the trouble unavoidable in transplanting them, the loss of plants from dry weather and careless planting, few ordinary farm-men being adepts at this operation. Should the farmer not choose to occupy a portion of his regular green crop break with this plant, it will well repay him to have an acre near the farm-yard planted with them; and if they are, now and then during the growing season, watered with the drainings of the dung-heap, or the contents of the liquid-manure tank, he will have in the autumn a most acceptable addition to his stock of house food.

Italian ryegrass coming in early in the season is useful, if on no other account; but, like the cabbage, unless the farmer is prepared to give it an unlimited amount of manure, liquid being most suitable, it is much better for him not to grow it. On poor or worn-out soils, or even on rich soils, where it is attempted to make repeated cuttings without subsequent top-dressings, it is absolute folly to grow it. On such land as the water-meadows of Edinburgh, that receive the sewage as it leaves the city, this plant gives an immense return, and from its being fit to cut at such an early period of the year, its value is greatly enhanced. Where the farmer is so circumstanced that he can by gravitation throw the droppings of his yards on a few acres, or where the land is easily reached by a water cart, he may grow heavy crops that will prove of great benefit to his stock during the summer season; but unless the watering can be done economically, it will not pay.

Clover, thriving so well upon light soils, and coming in as it does as part of the usual rotation on the farm, forms an extensive and valuable addition to the stock of summer-house-food. A portion of the first year's seeds can be cut early, beginning, if a favourable season, about the second week of May, and going on until it becomes too hard for soiling, the remainder being made into hay. Shortly after cutting and removing the hay, the clover is forward enough to be cut a second time, giving a large amount of excellent food, and worth to the extensive stock-master a very respectable sum in hard cash by the acre.

The last, but by no means the least important crop remaining to be noticed is the vetch or tare. In this valuable legum., really the whole strength of the stock-feeder lies, as the various sowings come in so conveniently as not only to create a diversity of food, but keeps up the supply with uninterrupted regularity for nearly six months of the year. Taking the case with

which it is cultivated and its excellent feeding properties into consideration, it is questionable if there is a more valuable plant known or cultivated in modern husbandry. They form a capital article of food for all the animals usually found on the farm—the horse, cow, sheep, and pig; and all thrive equally well upon them. For cows they are invaluable, as although they do not greatly increase the flow of milk, yet it is rich in butter, and the quality excellent, the texture being firm, and the flavour delicious. When sown, on land well prepared by grubbing, ploughing and manuring, about the end of August, they will come in by the 25th of April following, if the season is favourable and the situation sheltered. A mistake is often made by being too long in beginning to cut this crop, as before the sowing is finished it is apt, if a heavy crop, to rot on the ground, and thereby cause a good deal of loss, at a period of the year, too, when it cannot very well be spared. This can easily be obviated by making small sowings at a time, and cutting early. However green and succulent they may be, vetches will not scour cattle—a quality in rich green food very desirable. Vetches are usually termed a stolen crop, coming in, as they do, at a period of the year that admits of turnips or other green crop following them the same season. It is no loss to the farmer, however, to have one or two small sowings even so late as that they will be the only crop on that portion of his land for the season, as by that means a supply of food is

provided that will keep the cattle off the winter food until winter really has arrived (no slight consideration), and the summer quality of the butter is retained to a more extended period than is usually the case. There is no way cows will eat vetches with greater relish, or in greater quantity, than when just freshly cut, and brought in without lying in the sun. To have them eaten thoroughly clean, it is a good plan for the man in charge to begin at one end of the stall, giving a small forkful to each cow as he goes along. By the time he has the last one served the first is ready for a second allowance, which he at once proceeds to give; and so on, perhaps even to a third time. It is wonderful what an amount of interest a man who really loves the animals under his charge will take in enticing them to eat, and how well he will succeed. The same quantity of food put in before them all at once, would not be eaten with the same relish, and considerable portions would remain that no amount of coaxing afterwards would induce them to touch.

The leading features of this subject having now been touched upon, we draw to a close, but cannot conclude without recommending the most constant care and assiduous attention to every department of this business, as without the active supervision of the master or mistress it seldom does well, and even under the most favourable circumstances will fail of producing the results that might reasonably be expected. J. S.

AUTUMNAL AGRICULTURAL SPEECHIFYING.

Two of the most curious features in "extra parliamentary utterances," and the way in which noblemen deliver their sentiments to their tenants and neighbours, are the confident and glibly manner in which every old and new point of agriculture is discussed and "settled," and the warmth with which tenant-farmers are held up as deserving objects for a public man's anxious care and solicitude. But why should there be all this expenditure of breath upon practical farmers exclusively? Matters of this sort are becoming sadly monotonous and wearisome. If public men must talk—that is, if they consider it their duty to say something at the county meetings which periodically occur—why not vary the mode of address? why not let the lecture, or off-hand after-dinner speech, turn occasionally on cotton-spinning, silk-weaving, or slup-building, or some other branch of the nation's business? Why should farmers be the only class which, it is thought, need the assistance and advice of noble lords, M.P.'s, and aspirants generally for public fame and honours? The discussion of calicoes and ribbons, and stems, bows, sterns, and yard-arms, if judiciously done, would at least have the freshness of novelty, and be without that seed of irritation which is so often sown when men talk about things which they generally admit they do not understand, to men whose interest and business it is to have in respect to them a thorough knowledge. These suggestions we make under the conventional supposition that the chairman must make a speech of some kind about twenty minutes or half-an-hour in length, and that the other gentlemen who sit at the cross-table or "above the salt," and into whose hands the remaining toasts of the day are put, must follow suit. But if we may freely give an opinion, we should say that it would be far better for the gentlemen at the cross-table to "cut it short" at an agricultural meeting, and by this means devote one day in the year to listening to what some of the many intelligent practical men could say, if the opportunity were given them. Thus, while sound practical and scientific knowledge would be tapped and encouraged to flow for propagation in the county in which it was verbally expressed, and throughout the country on the "wing of the press," gentlemen who spend the "season" in London and the remainder of the year in the country would be gradually instructed, and perhaps, in time, become proficient in practical agricultural questions—such as economy of capital and profit and loss—in regard to which, according to their own "utterances," they are now, generally speaking, most lamentably inexperienced.

These reflections have been revived by a speech made by Earl Grey, as chairman of the Northumberland Society, at the dinner of that body, at Morpeth, a report of which will be found on page 216. Earl Grey entered minutely, and with

considerable energy, into almost every point which belongs to modern practice; and by the tone which clearly pervades the speech of the noble earl, it seems to him to be a matter of great surprise, as well as extreme pleasure, that practical farmers have not adhered to the rude implements and ancient practices, which were taken as a matter-of-course, and sufficient, fifty years ago, when the art of war was thought more of than the arts of peace. To Earl Grey this may be a source of great personal comfort, and the pleasure it would afford him in congratulating his friends on the discovery would no doubt be equally delightful; but to men who have been mixing with farmers during the above period, and who have thereby become familiar with their business-habits and sound judgment, there will be no room for an expression of joy and wonderment.

In support, however, of the above principal views and theories, Earl Grey discussed the show of stock and implements, which, he said, "gave abundant evidence of the progress which agriculture was making in the county." This is certainly an interesting conclusion, but it is not an original one by a long way. The decreasing cost of harvesting was another point; on which, even with the use of machinery, in the absence of hand-labour, as a necessity, most farmers will say the noble earl was not accurate. The blessings which belong to wool, both as regards its comfort to the poor, and the help the high prices of that article, from a greater demand, was likely to confer on tenant farmers, were not lost sight of. Nor were the cheering prospects which belong to increased rents forgotten. But let us be exact on this point. Said the noble earl, using a judicious amount of lubrication to the biggest bolts of his fanciful creations: "No doubt the farmers had a hard task in bringing about the great improvements they had done; but they had proved themselves equal to the task, and the proof of it was that at that moment the price of land in Northumberland was higher than at any former period, and it apparently tended rather to rise than to fall." Then the noble earl came to root growing, and the advantages to be derived from that greater meat-producing system, and particularly where "the use of portable rails or tramways" was adopted, "which in some parts of England was carried out to a great extent (!), and which did very much in preventing land from being injured in getting away the crops." We should very much like to know who was Earl Grey's informant on the "great extent" to which these "portable rails or tramways" are used in any part of England for agricultural purposes; and also who it is that needs to be informed that if these auxiliaries be used the remainder will follow. For Earl Grey's information we may tell him that no branch of farming can afford a profit on the use of

such a system for getting crops off. If any one attempts a course of cropping that would be likely to require these appliances, then the attempt would be wrong, and not the use of the tramway to lessen a difficulty right. This theory of course applied to heavy land, the discussion of which would not therefore have been complete had not the marvellous effects of steam-ploughing been quoted and cheerfully extolled. Some other matters were gone into, and to the gentlemen amateurs and town-bred politicians the whole speech was, no doubt, an intellectual as well as a political treat; but, unfortunately, for a picture so happily drawn and delightful to look upon, the whole thing to practised and professional eyes and ears is an utter absurdity. This conclusion we will not confirm by any ingenious argument that naturally suggested itself in abundance during the reading of the speech before us, but we will leave Earl Grey to show how easy it is for any one to raise questions, and, when the ground-work of the subject is not understood, how much more easy it is to argue illogically and thereby come to the most inconsistent and therefore un-instructive and damaging opinions.

How can the following be possibly made to harmonize with the foregoing? "Agriculture was extending and improving all over the world, the facilities of transporting corn were also increasing. Foreign countries were adopting railways, and even those countries which had been most behind and the exception were now adopting the railway. Thus those increased facilities were rendering the transport of corn to our shores from foreign countries more easy, and our population were enjoying the inestimable benefits of that cheap food which conduced so much to the general prosperity, and it was not likely we should return to the old prices."

How can these views, which are the only ones made by Earl Grey that had the slightest semblance of business accuracy in them, be reconciled with increasing rents, the expenses attendant upon the use of more machinery (whether by steam or horse power), and the high price of manual labour? As we have before said, from farmers having been so crippled by low prices of corn that they could not afford to employ men in the winter, the best of them have therefore deserted their native village and left farmers in the lurch at busy seasons. The fact is a large per-centage of land must go down to rye-grass, clover, and other perennials, and the cost of machinery, horses, and manual labour be thereby lessened by two-thirds. The Cleveland correspondent of the *Mark Lane Express* hit this question off in these few words: "Grass is the great thing needful, and the price of labour and of grain will, in this district, compel a large acreage to be seeded down." Other correspondents pointed as clearly to the same self-saving practice which the British farmer must pursue. Earl Grey, and the

theorists who agree with him, overlook two great facts, viz., that corn can be grown in "virgin" countries, where rents are nominal, at less cost for labour than it can be in this country; and then, when so grown, it can be delivered in London or Liverpool, from the other side of the Atlantic or Baltic, as cheaply as corn can be carried to the same towns from some parts of Northumberland. If present prospects are to continue, as above foreshadowed by Earl Grey, the labour-saving system of laying down to grass must be as much as possible adopted. For, paradoxical as it may seem to theorists, by a farmer thus reducing his returns, his profits will be considerably increased. But this result will ensue in this way: The cost of horse and manual labour on an arable farm in growing roots and corn will be quite two-thirds more than the expenses of grazing land. Then, as the production of meat will be less on the grass land than it would be on the arable, the price of fat stock will be more per stone, which will be another element in increasing the grazer's profit on a less expenditure. It is no use for Earl Grey to attempt to make water run up-hill. Nor must the noble Earl, and his admirers and followers, expect that farmers can pursue their business for benevolent purposes. The same principles which govern commerce, trade, and manufactures must sooner or later regulate agriculture. The whole thing turns on a question of capital, and the profit and loss on capital employed. If the public have to pay more for meat, butter, and cheese, that is the public's affair, and not the farmers'. The British farmer is now pursuing his business under laws which admit of his being undersold in matters of corn, therefore to save himself he must reduce his expenses by growing as little of it as possible. Should paying prices again ever occur, the land can be again broken up for straw crops, and it will then be improved for producing them.

Towards the close of his speech, Earl Grey expressed himself with that noble-minded modesty which is ever to be admired, and (agriculturally considered) with that self-appreciation which, when acted upon, is even more commendable: "He thought he ought to make some apology for having, as a person who could boast of comparatively little practical knowledge, ventured to address his remarks to persons of whom he had no doubt nine-tenths knew far more about these matters than he did." What a pity it is that the noble Earl did not, subsequently to proposing "Success to the Northumberland Agricultural Society," give another turn to the above sentiments, and then call upon one or more of the nine-tenths referred to, to give him the information which he, by his own admission, as well as the evidence of his "utterances," greatly needed—that is, if the noble Earl desired to rightly view the "signs of the times," and thereby to be able at some future time to make a sound agricultural speech. W. W. G.

FOREIGN AGRICULTURAL GOSSIP.

A review of a few miscellaneous matters may be acceptable. Among special agricultural exhibitions arranged for in France, we may mention one which the prefect of the Aveyron has just created for the sheep breed of Larzac, and which will take place Sept. 26th and 27th. Some rather celebrated cheese, made at Roquefort, is produced from the milk of the Larzac ewes; and at the exhibition just organized, admission will only be accorded to animals of this breed proceeding from the departments of the Aveyron, the Gard, the Hérault, and the Lozère. There will be two categories—one of animals reared on the plateaux of the district, and the other of animals reared in the valleys. The prizes will be awarded with reference to the three products of the Larzac breed: first, milk; secondly, wool; thirdly, flesh. Besides class prizes, there will be a prize of honour of £6 for the most remarkable flock of the district. A departmental exhibition will also be held by the Central Agricultural Society of the Puy-de-Dôme, at Thiers, from Aug. 31st to Sept. 3rd. "Prizes of honour" are proposed to be accorded for the best directed working, for *métayage*, and for gardening and fruit-tree culture. Prizes are also to be given to deserving agricultural servants, &c.—It is satisfactory to observe that an increasingly large number of eminent Frenchmen are interesting themselves in agricultural matters. As an instance of this we may note that the agricultural show of the canton of St. Julien, in the arrondissement of Roche-couart, in the Haute-Vienne, will be presided over, Sept. 17th,

by M. de la Guéronnière, senator, editor-in-chief of the journal *La France*, and president of the general council of the department of the Haute-Vienne.—The Norman Association has held an agricultural and industrial congress at Coutances. This association was founded by M. de Caumont, who devoted himself to its interests with much zeal.—A happy innovation was introduced last year, in the shape of conferences conducted on the field of the exhibition, by M. Corbière, veterinary surgeon and secretary of the agricultural society of Lesieux. In presence of a numerous public, and with stock on the spot, M. Corbière demonstrated the points of study which animals presented with reference to their conformation, their various aptitudes, and the ameliorations which they are capable of receiving.—The Emperor Napoleon, appreciating the services rendered to agriculture by M. Lacour-Lebaillif, laureate of the prize of honour in 1859, and an agriculturist at St. Fargeau, has conferred on him the cross of the Legion of Honour.—We may also mention an exhibition held at Liancourt by the Clermont Agricultural Society in the Oise. At Liancourt is an implement establishment founded by M. Duvoir, and now directed by M. Albaret. M. Albaret constructs steam engines intended to work in the fields; and steam tillage may possibly make a certain progress in France through his exertions—Experiments of a satisfactory character continue to be made in the south. The agriculture of the south of France is a good deal tried at present; and it is especially

the south-west which complains the most. Its complaints are legitimate; but it can only obtain satisfaction by mixing in the general movement which the whole country follows. Upon the sufferings of agriculturists in his district, the Comte de Noailles writes as follows from Buzet in the Lot-et-Garonne: "In the plains which border the Garonne, and which have so great a reputation for fertility, the wheat crop of 1865 has been deplorable; never have I seen it so bad. The most fortunate cultivators—and they are a small number—are at least half below the results of an ordinary year; in many cases, the crops have fallen off to the extent of two-thirds, and some even to the extent of three-fourths. Notwithstanding an almost complete failure of the crop, wheat still sells at almost the same price as it realized at the corresponding period of 1864. Everywhere proprietors are reducing their works and restricting their expenses. Cattle are diminishing every day in value from a want of purchasers in a position to pay for them. Products of all kinds, fruits, &c., no longer find purchasers, speculation being at a standstill in almost everything. The winter will be a trying one. It is easy to foresee the lot of country labourers. Many will go into the towns; and this will be so many arms lost for ever. Properties will be badly worked; and sheds, badly attended, will not return the necessary manure to the soil. The discouragement experienced is thus profound and general." We hope the Comte de Noailles thinks he has "piled up the agony" to a sufficient extent; if the picture is half as gloomy as he would have it, it is an extremely discouraging one.—M. De Monny de Mornay, director of agriculture, an officer of the Legion of Honour since 1854, has been promoted to the rank of commander. Many other French agriculturists of more or less eminence have also received promotions and appointments in connection with the Legion: among them may be mentioned M. Guemard, Aylies, Goiroud de Labaume, Paganon, Charles Jöbez, Naudin, Teysier des Farges, Henri Marès, Hardy, De Sainchorent, Duponchal, &c.—The forage-dearth which threatened French stock with famine must be met by all possible means. Happily recent rains have enabled herbaceous vegetation to display great vigour in the autumn, and farmers may now hope in consequence to replace in part the straw which has made default, and the first cuts of natural and artificial forage which have failed. The facts noted show how right it is to attach importance to the propagation of forage which will grow in the latter months of the year, and it is on this ground that M. Barral has applied himself with energy to the propagation of *Brome de Schrader*. M. Ponsard, of Omev, writes that he has been very well satisfied with trials made of rustic lucerne.—The note of M. de Lavergne on the diminution in the number of sheep in France has found contradictions at the sittings of the Central Agricultural Society of France. In the opinion of M. Barral the conclusions to be drawn from totals based on the statistics of 1852 and 1857 could only have value in so far as the two elements of the calculation were comparable with each other. This condition M. Barral considered was far from being fulfilled, as at present if statisticians have collected and registered totals they have never said to what degree of approximation they had pushed their calculations. Besides, if a diminution in the numbers of flocks has arisen under the influence of disease, and particularly of the watery cachexy of 1851 and 1855, it is possible, and even probable, that the evil is now completely repaired, and that the statistics collected in 1862, but which have not yet been made public, would indicate an augmentation in the "effective." M. Barral further observed that in the estimates referred to by M. de Lavergne account was only taken of the number of head, while regard must be had to the average weight of the animals, which has notably increased since the introduction of English breeds has favoured those numerous crossings, which have augmented the size and improved the general conformation of indigenous French sheep breeds. Good reasons are not wanting, then, for rejecting the conclusions drawn inferentially from the note of M. de Lavergne. It may be remarked that the eminent economist has affirmed nothing, but that he has confined himself to comparing with each other the results of the statistics of 1852 and 1857, calling the attention of cultivators and agronomes to a situation which might be considered to present cause for uneasiness if it were confirmed. At the same time, M. Delafond and Reynud did not consider it doubtful, from observations they had made, that from 1851 to 1855, watery cachexy decimated flocks in several departments,

and that a great many flocks were sacrificed from the fear of evil to come. Besides, the suppression of *vaine pâture* has caused a certain quantity of sheep to disappear, and the breaking up of heaths in the centre of France has exerted the same influence. In the case of many cultivators, in fact, the maintenance of a flock of sheep was intimately associated with the possession of heath, on which the poor sent a scurvy lot of six or eight sheep, escorted by two dogs, one or two children, and sometimes even a woman. This state of affairs, of which M. Moll was a witness in Poitou, has become greatly modified since the heaths have been brought into cultivation, and since the scarcity of labour has given an important value to the work of women and even of infants. With the advent of arable culture, heath has disappeared, and on many points sheep have given place to horned cattle. In part of the east of France the rendering valuable and letting of communal properties has brought about the same results, so that the fact, indicated in the note of M. de Lavergne do not remain without explanation, or, at any rate, without an appearance of probability. The French appear to regard the sheep, rightly or wrongly, as essentially the beast of poor lands and poor districts, and some of them only rub their hands complacently if he cedes the *pas* to more productive and more easily maintained species. But, properly speaking, sheep-breeding is not in a bad position in France. If wool does not attain a very high quotation, at least it is not very greatly depressed, and meat sells at tolerably remunerative prices. Forage cultivation is making continuous progress, and flocks are being notably improved from all points of view, so that the increase in quality and weight compensates for the decrease in numbers. Such are some of the hypotheses set up on a subject of considerable interest. At the same time, all parties agree that it would be desirable to have at hand the last statistics collected in 1862. Statistics are not like wine, improved by the lapse of time; indeed, if they are to be of any use for national purposes, they must be made available for the examination of the public within a few months of their collection.

BARLEY AND MUSHROOMS.

STR.—Wet nights and warm days make barley and mushrooms sprout, neither of which facts are profitable or pleasurable to the farmer; for the town or village cadger steals the fungi, and the Chancellor of the Exchequer claps £5 an acre on sprouted barley. So in a wet, warm August the farmer has but a poor time of it. The old tale is likely to be proved, that if barley were turned one way only it would reach the stack-yard: any how it reaches it in bad plight, and the farmer asks himself where he is to sell, and the maltster where he is to buy, all which anxiety is mainly caused by the £5 an acre tax. All other commodities have a relative and graduated value, but barley is *fine or bad*; a few days' rain or a laid crop makes all the difference between malting and grinding, and this because of the £5 an acre duty. I plough about 300 acres, and I fear I have not this year a quarter of barley fit for Burton. Being a burnt child, I do not venture to sow a fall rotation acreage, but take spring wheat on the best land. Taking half of the five-course shift (30 acres) I may have about 150 quarters of barley. What am I to do with it? "Grind it," said a malt-tax miller the other day. Yes, at a loss of 10s. per qr., or £75, in consequence of the £5 an acre tax. I can't malt it for my own use unless I pay the £5 an acre tax, although I employ during the harvest about 30 hands, who, when mowing, reaping, badging, or carrying, drink half a gallon of ale and half a gallon of beer each daily, a considerable portion of such ale and time being consumed in harvesting the said barley. By-the-by, the excisemen, who have now little to do, ought to be on the look-out, or the farmers will be out-of-door maltsters in spite of themselves. The said rural excisemen might fill up their time by gathering mushrooms for the supervisors. I mention this because such method appears to obtain among railway officials. A stranger was gathering mushrooms in one of our fields, and I asked him who gave him permission. He said no one; but his master often sent him out for an hour or two to gather mushrooms. "Who is your master?" "The railway over-looker." "Is he fond of mushrooms?" "Very." Do you, Mr. Editor, eat mushrooms and drink beer? I hope you do; but for the ease of a quiet conscience and stomach, do not steal one nor tax the other. Yours, &c., GEO. A. MAY.
Elford Park, 16th August.

AGRICULTURAL PROGRESS IN AUSTRALIA.

Some statistical returns, prepared in the Australian colonies specially for distribution at the Dublin Exhibition, furnish us with many interesting details of their agricultural progress. Taking Victoria first as the most populous, and with an area nearly as large as that of the island of Great Britain—although as yet the population is only seven to the square mile—we find that the crown lands sold and granted in the colony from its first settlement to the end of 1864 amounted to nearly six million acres, the purchase-money realized being £11,690,000. The extent of land remaining inalienated at the same date was 49,735,948 acres, of which 28,826,756 acres were held under lease for pastoral purposes only by 1,161 occupiers, giving an average of about 25,000 acres to each occupier! The alienated land is nearly all in occupation. By the last return to April, 1864 17,679 holders were in possession of lots of over an acre in extent, the average to each being 314 acres. The same return showed that nearly three-fourths of the alienated land was enclosed, but that only an eleventh was under cultivation. The total extent cultivated was 507,798 acres, or less than an acre to every head of the population. About 149,000 acres were under wheat, 152,000 acres under oats, 8,000 acres under barley, 28,000 acres under potatoes, 96,000 acres under hay, 35,000 acres under green forage, and the remainder under minor crops. Owing to atmospheric influences, the last harvest was to a great extent a failure, but during the past ten years the average produce to the acre of wheat has been 20 bushels, of oats 27 bushels, of barley 23 bushels, of potatoes 2-four-fifths tons, and of hay 1½ tons.

The minor crops consist of maize, rye and bere, peas, beans, and millet, turnips, mangel wurtzel, beet, carrots, and parsnips, onions, tobacco and vines. For the two latter, the soil and climate of Victoria appear to be well suited, although their cultivation has only recently begun to be much attended to. Tobacco during the last season covered 623 acres, and produced 5,913 cwt.; vines covered 3,076 acres, the produce of which was 121,000 gallons of wine, besides a large quantity of grapes otherwise disposed of. At some of the recent agricultural societies' shows in the colony the superior quality of the wheat this harvest is spoken favourably of, the prize-samples weighing respectively 67, 67½, and 68 lbs. the bushel, and the first-prize barley 60½ lbs.

There are now in the colony 110 flour mills, which last year operated upon 3,280,000 bushels of wheat, and produced nearly 70,000 tons of flour. The live stock in the colony, according to the returns for 1864, amounted to 103,328 horses, 126,786 milch cows, 548,486 other horned cattle, 7,115,943 sheep, and 79,655 pigs. All these descriptions of stock show an increase in the numbers returned in the previous year. Pigs seem particularly to be getting into favour, the number kept having doubled in five years, and sheep have increased in the same period by one million and a quarter. There seems a growing disposition in the colony on the part of yeomen to hold small flocks of sheep, by which a good income is to be derived with very little risk and with little chance of its being affected by the fluctuations in the market.

Any one securing a section of land, and having means to fence and till a portion of this, and as soon as it is fit to receive them, to put three or four hundred sheep on it, may consider himself independent. While new, and

in good heart, the land will produce enough to pay the expenses of tillage and of laying down a few acres each year under grass, while the keeping of sheep from the first under such a system as this will not only prevent any impoverishment of the land, but will actually improve it. After a few years of such treatment and the steady prosecution from the first of a plan for the preparation of it for sheep, a section of 640 acres should keep from 1,000 to 1,500 sheep, allowing 100 acres to be under crop each year, or less, if the distance from market be too great for the growth of agricultural produce. In such case, the produce of the tilled land may be entirely fodder for the sheep, and they will pay for what they consume quite as much as is obtained in ordinary seasons for grain or other crops, while the improvement of the land goes on, and it is each year rendered capable of carrying a few more. If the land is open, of good quality, and well watered in the first instance no very long time need elapse before it will be able to carry its three sheep to the acre, and a section in such condition will be a nice property for a yeoman and his family. But no one need expect to take up land, and do this all at once: for it is only land which has been tilled and laid down with the cultivated grasses that can support such a quantity of stock. A well-selected section should, however, keep a sheep to the acre from the first after being fenced in, and such a flock ought not only to support the owner and his family, but also assist besides in drawing out the latent capabilities of the land.

The wool exported in 1864, has been approximately returned by the customs at 39,407,726 lbs., valued at £3,247,128, which exceeds by more than a third that exported from Victoria in the previous or any other year. The tallow exports were 3,882,000 lbs., valued at £60,230, and the hides and skins valued at £102,684.

From the wheat statistics for South Australia we learn that the number of acres under this grain last year was 390,714, against 335,758 the year before, an increase of 54,956; but the total produce was only 4,250,563 bushels, against 4,691,919 the year before, a decrease of 441,056 bushels. Thus the average was only eleven bushels to the acre, a falling off of three bushels in comparison with the yield of the year before. The partial failures were sufficient to bring down the average much below that of the previous year, but the deficiency was scarcely expected to be so great as it is. The highest yield appears to have been that of the Mount Gambier district, 17½ bushels to the acre, while some portions of the county of Adelaide only averaged 6 and 7 bushels. The general average of 11 bushels to the acre is the lowest for the last five years. There will be, of course, a smaller surplus for exportation by the 441,056 bushels of wheat less, equal to 94,463 tons of flour.

From the statistics of Tasmania we learn that there has been a serious falling off in several important items. No correct returns of the wheat were to be obtained farther back than 1857; but in 1858 the quantity sent out of the colony was 226,268 bushels, which was exceeded by upwards of 4,000 bushels in 1861, while in 1864 the total export of wheat only amounted to 26,383 bushels. Thus, in three years, the export of wheat fell away to a tenth of what it was in 1861, the figures being for that year 230,398; for 1862, 182,193; for 1863, 98,524; and for 1864, 26,383 bushels. Nor was this compensated for in any way by an increase in the quan-

tity of flour sent out of the country, for this declined from 5,158 to 4,319 tons in the one year; but, in point of fact, more than the actual surplus was sold even then, for a considerable quantity of flour had to be imported before the end of last year, to meet the consumption of the inhabitants. The quantity of oats has also fallen off materially: from 516,590 bushels exported in 1860, the highest year of the series, to 137,800 in 1864, and the export of potatoes fell off in the one year from 12,615 to 10,509 tons, though this last quantity was still greater than had been exported in any former years. Fruit and jams alone showed an increase, in the former from 144,971 to 160,138 bushels, and in the latter from 7,450 to 21,670 packages in the year. The exhaustion of some portions of the land by bad farming, and the laying down of others in grass, would account for the great

falling off in the yield of agricultural produce, as it does not pay now to clear new land for tillage, and there is none in Tasmania fit for the plough without. But how are we to account for a falling off in the yield of wool? In 1864 there were 4,972,383 lbs., an increase on the year before; but the export in 1862 was 5,241,650 lbs., and in 1859, 6,107,903 lbs. The difference in the seasons makes some difference in the weight of wool grown; but the number of sheep must have decreased to effect such a change as this, while the flocks ought rather to have increased with the decline of tillage. Altogether, these tables show the state of affairs to be much worse than any one was prepared for in Tasmania, and that island has plainly lost for ever all claims to the title accorded her her twenty years since—that of the granary of the Southern Hemisphere.

NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

MEETING AT MARKET RASEN.

This association has so grown with its growth that the more attractive parts of its annual exhibition—viz., its numerous and large classes of live stock—have become almost altogether unwieldily or unmanageable as an undertaking for a single day's show. With nearly 500 lots and pens of cattle, horses, sheep, and swine to be got into the yard, or rather fields, in the morning, and to be "judged" after 9 o'clock, the whole thing, to those who take ordinary business interest in it, is a continuous process of hurrying and scurrying all day, the end of which is no clear or defined opinion of the merit or demerits of any of the classes or the judging, unless one set is stuck-to to the end. To those who are officially or professionally engaged, the labour is something so excessive that it is impossible to get a complete and correct list of prizes by the expiration of the longest time that one's physique may be fairly taxed. On Thursday the judges had not awarded the prizes of several of the different classes till between one and two o'clock, p.m.; and in the case of the lighter breeds of horses, Messrs. Wood, Ellerby, and Atkinson had two classes to get through with after the chairman had taken his seat at the dinner-table, some time after the hour fixed, viz., three o'clock. The thoroughbred stallions were in the ring when grace before meat was said, and the roadsters had scarcely walked straight from the ring out of the show field when the noble chairman was giving the usual loyal and patriotic toasts. This delay, it may be at once fairly said, was no fault of the judges; for some of the horse classes were so good that it was a most difficult task to dispose of the single and large prize for a class which brought so many good animals together. Where two or three prizes are at the disposal of the judges, there is not so much delicacy felt as where a single declaration as to comparative merit has to be made. And no one who respects his own judgment, as well as that of many men who, it is known, are looking on, can jump to a decision in five or ten minutes, when four or five horses are so equally good that it must depend at last on the balance of taste and fancy, rather than judgment, as to which shall be the one presented with the single substantial favour. This is just how matters stood at Market Rasen in more classes than the one of twenty-two hunter-geldings and fillies shown for the prize of £50.

What are the conclusions that we can only come to, on the strength of the above observations? Why, simply that this association must drop its divisional distinction

of "*North Lincolnshire*," resolve itself into a county institution, pure and simple, and extend its annual meeting to two or three days. There is plenty of field-room in Lincolnshire for an important county association; and with Great Grimsby at the northern end, and Hull across the river, besides Boston, Stamford, and Grantham in the south, Louth in the north-east, the town so well known for its horse fair, Horncastle, more in the middle, and not forgetting Gainsborough and Brigg, in addition to the county town, there is ample scope for a migratory system of visitation quite large enough to make a meeting a novelty to the town and neighbourhood which may come in turn for the next meeting. This is the first secret of pecuniary success in county agricultural shows. The neighbourhood and districts within easy reach by road and railway were evidently in a state of general holiday-making on Thursday last, when about 10,000 entered the show-yard. This periodical drawing together of all classes has advantages so well known that they need not be here repeated; and the readiness with which people do meet when no opportunity occurs for it to be said, "I went last year, or two years ago, and I don't care about it this," is a sufficient guarantee that any reasonable investment in the portable shedding and water-proof roofing that may be required for night-protection would be amply repaid, pecuniarily, to say nothing of the increased and more serviceable impression that would be made on the minds of youths who are aspiring to agricultural success and honours, and particularly on the minds of townspeople, and outsiders generally, who now so often believe they have a thorough acquaintance with all the ins-and-outs of agriculture, both in its scientific as well as practical bearings.

In the midst of such helter-skelter and tip-toeing around the ring, to see the animals undergoing the authoritative scrutinizing process, there is no fair opportunity for that collected and instructive discussion which is so desirable; not, however, so much that farmers may be much improved in their art, as that townspeople and outsiders may be sufficiently instructed to know how to appreciate what is soundly as well as otherwise correctly done, according to the most reliable principles of economy. But as it is, the only conclusion that it seems is generally come to is, that if such an increased collection of fine animals can be made, and such a large square of closely-packed machines can be pitched and set a-going, farming must be in a very much increased state of pecuniary prosperity, and that any cause but the right

one is given for, or supposed to exist in respect to, the difficulties under which agriculturists and consumers are now struggling in regard to every first necessary excepting corn. But if a two or three-day meeting took place, not only would many more of the townspeople among whom the meeting was held be able to pay their shilling or sixpence, but exhibitors and friends of exhibitors, and subscribers generally—in short all the practical attendants—would have a tenfold opportunity for giving correct information to classes who, in this respect particularly, prove the philosophy of Pope's opinion when he says, "A little knowledge is a dangerous thing." This argument applies to more societies than "North Lincolnshire," and to more results than we have pointed to; and as we have had a good opportunity for observing the amount of energy and pluck, as well as judgment in organization, which is regularly displayed by Lincolnshire men at fairs and ram sales, we have not the slightest doubt but that steps will be at once taken to remedy the shortcomings pointed at as regards an effective and impressive—correctly impressive—agricultural exhibition; and by another year a meeting will be organized that will be worthy of their great and well-cultivated county, of their good horses, of their fine Shorthorns, their long and lustrous wool, and therefore of themselves as good men of business.

The Shorthorns were a large and good show, a number of them being excellent, both for size and proportion of flesh to bone; while there was nothing to complain of on this occasion about the vigour and hardness of the animals being on the decline from excessive feeding and pampering. The prize of £20 for the best bull was so offered that it could be competed for with animals outside the county, and it took in all the other classes above a year old. It was awarded to Lord Pam, 3 years and 6 months old, sire Lord Clyde; and, as will be seen by the prize-list below, he came from Yorkshire. He is a very heavy-fleshed and thick-set kindly red roan. Mr. Sharpley's Lord Pantan, a four-year-old, and bred by Mr. Dudding, is a very long and heavy-fleshed animal, with great fore-quarters and well-arched ribs, and his back is unusually true, considering his length. Mr. Brown's Masterman, which took the premium in the three-year-olds, has a wide straight back and great loin, is very fleshy, stands on short legs, and carries a neat head and horn. In the two-year-olds, Mr. Middlehough's Prince of Wales, which competed in class 1, is an extra-good light roan, with perfect hind-quarters, great shoulder, and heavy but neat neck; the only thing required to make him of an A 1 stamp, being a middle that, for one so good generally, is singularly weak just where the tape goes. Mr. White's Baron Blencow sire Royal Windsor, is a neat and smart silvery white. Mr. Brand's red and white nine-months-old calf Mohawk, sire Knight Errant, is wonderfully good in his fore-quarters, brisket, and shoulder, and carries the finest possible head, with a long tapering nose. If a bovine strippling could be relied on for certainty in regard to the promises he makes, as this young gentleman has, in addition to that fine stylish movement which gives a favourable impression even with animals produced for food, we might predict with confidence that he would make a considerable mark at future shows. Mr. Foljambe's Duke of Windsor was second, and, at eleven months old, would nearly make two, in appearance, of the first; but in Duke of Windsor there are many indications that he will grow "raw-boned" with size, and otherwise unlike, particularly about his head and horn, a prize-taker in good company. Messrs. Dudding's Colonel Tuck, by Friar Tuck, is a good long, straight backed, fleshy, and otherwise promising calf.

The females were preceded by Mr. Torr's Gracious Princess, which took the first prize in the cow class; and

she is a fine fashionable roan, with deep, heavy fore-quarters, and a tapering neck, and fine head and horn. Mr. Hutton's Pearl was also very handsome. Mr. Lynn's Pamela is an extraordinarily fat-natured and well-fed symmetrical heifer, which promises much better for a good position at Bingley Hall or Islington, than for a good character as a breeder. Mr. Laumbe's first yearling is a heifer with great substance; Mr. Foljambe's silky-coated roan was a picture to look at; and Messrs. Dudding's second promises to be of great size and width, as well as full of heavy flesh.

The pens of Leicester sheep were only six, but Mr. Borton's prize was a good firm-backed curly and lustrous-coated ram; and Mr. Marris' No. 70 had an excellent back and good "skin," while his pen of ten ewes were worthy of the £10 prize, although they stood in their smartness alone.

In the classes of "Long-wool sheep, not being Leicesters," it was often difficult to tell where Lincoln began and Leicesters left off. However, the character of the Lincolnshire sheep, as it was found many years ago, before turnip-growing and folding were generally practised, stood in the same relations to modern notions and necessity for quick returns, as the Norfolk black-faced and the big coarse-headed Hants sheep did to the more compact and docile Southdown. If the Leicesters have in many cases degenerated into smallness and fatness with thin light coats, and the Southdown has, under similar treatment of in-and-in breeding, become too small for profit, there cannot be a question raised about the fact that all our improved and most valued modern flocks owe their superior qualities—the long-wools to the Leicesters, and the short-wools to the Southdowns—to the way in which long and rambling crooked frames have been toned down and brought into shape by these more distinct breeds.

Looking at the show of sheep at Market Rasen from these points of view, we were glad to perceive there were growing opinions in favour of stock sheep being as mathematically true in form as it is possible to get them; for if there is a limit to the size of sheep, it is folly to attempt to grow donkeys in sheep's clothing, as this attempt at unnatural development will be sure to result in flat ribs, warped spines, and legs that drag behind the tail, instead of being actively and firmly lifted in a correct position beneath the carcass they are intended to support and carry.

It may be here appropriately asked, What is the advantage to anybody of attempting to produce extraordinarily large frames, as a rule? It is true, some large joints of mutton are wanted for certain purposes and on certain occasions; but if a large breed of sheep be kept up, there will always be enough extraordinary off-shoots from a flock to supply the demand for great legs and saddles; and there cannot be two opinions among men of experience in regard to the difference in profits from a flock when symmetry is made the first object and size the second, and where size is made the main aim and symmetry and well-balanced frames left more to chance. Another point may be here touched upon. If there be any truth at all in scientific conclusions—and no one can doubt it, if he has weighed these mental results with practical tests and calculations—an acre of roots or green food and so much corn would be worth so much for producing a crop of mutton. If, say, two cwt. of guano and two ditto of superphosphate would produce so many tons of turnips, the food so produced would yield so much live mutton,—supposing the sheep were equally healthy and thrifty—whether they were of a naturally small or large size. No man will argue that a Hampshire Down does not eat more, and exhaust the land more, than a Southdown. By the same rule, a neat Leicester and an exaggerated Lincoln differ in their consumptive and exhaustive characters. For these further reasons, we repeat that the whim, or

fashion, or opinion which now regulates the actions of some breeders and feeders is, on the ground of economy and profit, almost altogether a mistaken one. It is quite true, if sheep for sheep be taken, a 35lbs. per qr. one would be worth more than one weighing 25lbs. per qr. But, then, the points arise about fecundity and capacity to rear, as well as about the weight of produce (other things being equal), depending on the quantity of food that goes into the mouth and stomach. For these reasons, we again repeat that we were pleased to see the increased tendency on the part of the judges and spectators, in favour of true frames and straight, stiff legs; and we have no doubt but that these views will have grown more general by, and be further demonstrated at, the large sales of Lincoln rams which will shortly take place.

After these general remarks, we will not make any critical comments on individual sheep, further than to say that Mr. Lynn's second-prize two-shear had a Leicester ancestor, on one side or the other, not many generations back, and that this stamp of sheep, and the other similar ones in the yard, were undoubtedly to be preferred, both on the score of economy of food and the direct profit they would yield by the weight of mutton and wool produced. Mr. Edward Davy's pen of ten were fine old ewes; as Mr. H. Grantham's gimmers were very beautiful and uniform in size, frame, and wool; while Mr. Lister's were regular and neat in size, but not so true in character. Mr. Young's she lambs were a capital pen of ten, and Mr. Edward Davy's were a good second to them.

The pigs were much less numerous than these animals usually are in counties where more dairying is done. Among the large boars there were, however, some excellent specimens. The combination of size and quality, as exemplified in Mr. Duckering's fine two-year-old hog, fairly admits of its being pronounced a first-class animal; whilst Mr. Dyson's enormous hog, at the age of 2 years and 6 months, was as fine a quality as could be expected in one of his size. It may be mentioned here that a modern agricultural show-yard does not require the same class of attendants as the rings of olden times, when bull-baiting was popular, probably did. This we name because it is equally important to the owner of stock and the public that men given to sobriety and respectful address should be placed in charge of animals exposed for public inspection; and a more unmitigated and unwarranted display of ruffianism, excepting that no blows were exchanged, than was made by a man professing to be in charge of one winning exhibitor's pig, we never saw. The regular attendants of an agricultural show-yard do not need the full force of Leeds back-slums bullyism to draw or enforce rules for the inspection of animals; and the less scrupulous spectators, if they exceed the bounds of reason in touching an animal, can be checked without the use of that coarseness of speech and manner to which it is to be hoped even the mining districts around Leeds are strangers. Mr. Graham's young boar of the small breed was very fine and neat; and Mr. Thornton's was a good second here. In the other classes there was nothing below mediocrity and not much above it.

The horses as a whole were undoubtedly the best for form, quality, and size according to their classes, that we ever saw at a county meeting; and, as Mr. Jacob Wilson said, in responding to the toast "The health of the Judges," the Market Rasen collection has undoubtedly surpassed this department of the show at Plymouth. As regards numbers too, we find there were only six more at the Royal than at the North Lincolnshire meeting—the number at the former having been 193, and at the latter 187. These facts alone are enough to justify the opinion we have above expressed about the farcical performance comprised in bringing so many animals together to be before the public only seven hours, during which

time all the interest of judging, private comparison, and philosophic examination have to be got through with, or rather that impossible feat attempted.

The result of our record of the first class to which we have to refer, will be some further confirmation. A prize of £20 was offered "For the best thoroughbred Stallion for Hunters." These were brought before the judges after 3 o'clock, and while they were deliberating we went to the next field to pick up a few stray late awards, which we had not secured, and when we came back the ring was cleared, and the horses had "left the field and gone," while at the same time no opportunity was allowed for us to get the award; therefore in this particular our readers must be content to wait till next week. This, however, is not much loss; indeed, as we perceive a local contemporary was in the same difficulty, perhaps the prize was withheld for want of merit.

In the draught horses, Mr. Warburton's Splendour, a seven-year-old iron grey, is an immensely powerful, well-balanced and good-looking horse. Matchless and Farmer's Glory are also great and good bay horses of the Lincolnshire size and stamp. This was a good class. In the roadsters, Mr. Bromby's Phenomenon looked well for compactness and general appearances, while his style and activity were equally commendable. Another of the same colour, a bay roan, Young Quicksilver, is a leggy and light-barrelled two-year-old, and promises to grow out of a roadster's height as well as general character.

Among the mares for breeding hunters there were two to redeem the otherwise poor character of the long string of twenty-two entries. The first prize is a twelve-year-old bay, of great power and good appearances, her quarters being roomy as well as correctly formed, and her temperament—an important element—undoubtedly courageous as well as docile. The second, Mr. Fieldsend's, is what may be termed a perfect model—*within herself*. This, in addition to the fine condition she appeared in, adding to her natural beauties of form and features, made many spectators inclined to think the judges had committed a great mistake. But in our opinion they displayed great soundness in over-looking the fine quality and brilliant appearances generally of the dappled bay, in favour of the more roomy first prize. This was a class for breeding hunters, therefore the question of the probable issue had to be taken into consideration; and if there be any soundness in the theory—that the best sire for hunters is a stout thorough-bred horse, why it would have been a weakness to have reversed the decision in favour of the fine quality and beauty of Mr. Fieldsend's mare. For these very elements, in addition to the second mare not having an ounce of bone to spare, would give the great probability that her issue, if by a thorough-bred sire, would be weedy "tits" or a lady's Rotten-row canterer. If the two animals had been before us as *mares for hunting* we should unhesitatingly have given the more elegant bay the preference; but as they were in competition as mares for *breeding hunters*, we as readily agreed with the judges' decision.

The other more important classes, which were brought together by premiums offered by gentlemen in the county, were of a very interesting character. There were nine five-year-old hunting mares and geldings in competition for Lord Yarborough's £10 premium; and Mr. Lacy's black roan, which took it, has fine qualities, including a good style of moving, combined with great power and general good appearances. We were informed this horse was bought by Mr. Collins, of London, at a long figure. Mr. Hobbs, of Stainton Hall, Caistor, had in this class a nice-topped short-backed gay chestnut gelding. In the hackneys not exceeding 14 hands 2 inches the most attractive one was Mr. Frankish's perfectly-formed light

mare, of a beautiful quality, and a style of moving not to be surpassed; but the favour was conferred on one with more size and substance. Mr. Olding's was a good brown cob; but being therefore out of his class, he was "no where."

The class of the day, however, was formed of the twenty-one hunting geldings and fillies, four years of age, mustered in response to the handsome £50 premium offered by Mr. Henry Chaplin. There were twenty-two entries, but Mr. James Hornsby's chestnut gelding became alarmed, after entering the horse-box, at Grantham, and in plunging threw himself from which he was sufficiently put out of trim to prevent his making an appearance. Two of the London prize horses were there; Mr. Clark's chestnut, Cotton Stockings, and Mr. Percy's Cumberland Bay; but neither of these was more than commended, although they were among the five between which the single substantial award lay. We certainly never saw five better animals standing together, and we should have been equally satisfied whichever one might have received the honour; for, as we have observed above, it must have come at last to a balance of taste and fancy, and not to a decision from superior excellences or one or more palpable comparative defects. Mr. Clark, who had four entered, had his bay gelding among the five, and he was also commended. Mr. Jewison's brown gelding was also in this lot, and therefore commended; and we were afterwards informed on good authority that he was sold to Sir John Trollope for 250. The class, as a whole, was a most excellent one; but there were one or two that were altogether out of place. One from Ulechy, a bay gelding, will make a good single carriage horse for large parties who may prefer long rides to pace; and one from Newark, a bright bay, and also a gelding, but whose colour was more lustrous than his other appearances, for with his linen-prop legs, cow thighs, and other defects and uglinesses, it would be difficult to tell where he would be in his proper place. The premium was given to Mr. Jackson Everett, Park-ane, Doncaster, for his excellently-formed and stylish bay gelding.

The roadsters not exceeding 15½ hands were the last class, and an excellent one it was, giving the judges some difficulty to come to a satisfactory decision. Mr. Thornton, of Lincoln, had three in this class, two of which were very smart—one a black mare, with excellent appearances for quick, light work; and the other a very clever brown gelding, with great working traits. The judges, however, were inclined for more substance, and the award lay between Mr. Wakefield's very beautiful roan, with very fast and good action; and Mr. West's very powerful six-year-old brown mare, but which was more of a hunter animal than the roan. The premium, however, went to Mr. West.

P R I Z E L I S T :

CATTLE.

SHORTHORNS.

JUDGES.—Wm. Carr, Stackhouse, near Settle.
John Painter, Forest-row, Nottingham.
J. Wilson, Woodhouse, Morpeth.

Bulls above one year old.—Prize, £25, J. R. Middlebough, South Milford, Milford Junction.

Bulls three years old or upwards.—Prize, £5, Pereira Brown, Glentworth, Lincoln.

Two-year-old bulls.—First prize, £10, J. R. Middlebough. Second of £4, John Charlesworth, Headfield, Dewsbury.

Yearling bulls.—First prize, £10, Elan Cartwright, Walsby, Rasen. Second of £4, Benjamin Wass, Worlaby, Brigg.

Bull-calves under a year old.—First prize £5, G. Bland, Coleby Hall, Lincoln. Second of £3, G. S. Foljambe, Osberton Hall, Worksop.

Cows more than four years old, having produced a calf at

its natural time, within nine calendar months of the time of showing.—First prize, £8, W. Torr, Aylesby Manor, Grimsby. Second of £4, Wm. Hutton, Gate Burton, Gainsborough.

Heifers, three years old, having produced a calf at its natural time.—First prize, £7. Second of £3.—*No entry.*

Two-year-old heifers.—First prize, £6, John Lynn, Stroxtun, Grantham. Second of £4, Wm. Torr.

One-year-old heifers.—First prize £6, Wm. Lambe, Auburn, Lincoln. Second of £4, George Bland. Third of £2, Herbert Salt, Methley Park, Leeds.

She-calves under one year old.—First prize, £4, G. S. Foljambe. Second of £2, Messrs. Dudding, Panton House, Wragby.

COTTAGERS' PREMIUMS.

Milk cow, having produced a calf within nine calendar months of, and in milk at the time of showing, the property of a cottager or mechanic occupying not more than ten acres.—First prize £4, William Kirk, Stainfield, Wragby. Second of £2, Edward Richardson, Hainton, Wragby.

SHEEP.

LEICESTERS.

JUDGES.—L. Borman, Irby, near Grimsby.

J. B. Slater, Cammeringham, near Lincoln.

Rams of any age.—Prize, £10, John Borton, Barton House Malton.

Pens of ten ewes or gimmers, the ewes having suckled lambs up to the 10th July.—Prize, £10, Thomas Marris, Ulechy Chase, Ulechy.

LONG-WOOLLED (not being Leicesters).

JUDGES.—R. Johnson, Westbrough, Grantham.

E. Lythall, Radford Hall, Leamington.

Harwood Mackinder, Spilsby.

Rams of any age.—First prize, £15, John Lynn, Stroxtun, Grantham. Second, Charles Clarke, Scopwick.

Shearling rams.—First prize, £10, Robert Wright, Nocton Heath, Lincoln. Second of £6 and third of £3, William Collingwood, Fulbeck, Grantham.

Two-shear rams.—First prize, £8, Henry Grantham, Sturton, Brigg. Second of £3, Messrs. Charles and John D. Lister, Coleby Heath, Lincoln.

Pens of ten ewes, having suckled lambs up to 10th July.—First prize, £8, Edward Davy, Thoresway, Caistor. Second of £3, Mr. Ealand, Aisthorpe, Lincoln.

Pens of ten shearling ewes or gimmers.—First prize, £7, H. Grantham, Sturton, Brigg. Second of £3, Messrs. Lister, Coleby Heath, Lincoln.

Pens of ten she-lambs.—First prize, £5, J. J. Young, Claxby, Rasen. Second of £2, Edward M. Davy, Thoresway, Caistor.

HORSES.

AGRICULTURAL.

JUDGES.—J. Brooks, Grimsby.

R. G. S. Howard, Lincoln.

T. Plowright, jun., Finchbeck, palding.

RIDING HORSES.

JUDGES.—W. S. Atkinson, Woodlesford.

T. Ellerby, Whitwell, near Malton.

J. Wood, Market Overton, Rutland.

Stallions for draught horses.—First prize of £15, W. Warburton, sen., Sturton, Retford; second of £5, William Duckering, Topholme, Wragby.

Stallions for roadsters.—Prize of £8, John Bromby, Alkboro', Brigg.

Mares for breeding hunters, with a foal at their heels.—First prize of £8, Charles Burkinshaw, Benniworth, Wragby; second of £3, John S. Fieldsend, Stainton-le-Vale, Market Rasen.

Mares for breeding draught horses, with a foal at their heels.—First prize of £8, Messrs. Lister, Coleby Heath, Lincoln; second of £3, William Tennant, Barlow, Selby.

Mares for breeding roadsters, with a foal at their heels.—First prize of £6, J. Coupland, Henswell Cliff, Kirtou Lindsey; second of £3, Rev. W. Jenkins, Fillingham Rectory, Lincoln.

Mares for breeding carriage horses, with a foal at their

heels.—The prize of £6, J. G. Little, Blyborough, Kirton-in-Lindsey.

Hunting fillies, two years old.—Prize of £5, J. J. Young, Claxby, Market Rasen.

Hunting fillies, one year old.—Prize of £4, W. E. Hobson, Kettlebythorpe, Brigg.

Cart fillies, three years old.—Prize of £5, James Greenhouse, jun., Blankney Fen, Lincoln.

Cart fillies, two years old.—Prize of £4, James Cook, Kingerby, Rasen.

Cart colt foals.—Prize of £3, Anderson Kay, Glentworth, Lincoln.

Cart filly foal.—Prize of £3, R. G. F. Howard, Temple Bruer, Lincoln.

PREMIUMS OFFERED BY GENTLEMEN.

By the Right Hon. the Earl of Yarborough, President: Hunting geldings or mares, five years old, the pedigrees to be taken into consideration, £10—William Lacy, Panton, Wragby. Hunting geldings or mares, three years old, by a thorough-bred horse, the pedigree (if any) of the mare to be taken into consideration, £5—Richard Mason, Keddington, Louth.

Hackney geldings or mares, not exceeding fourteen hands two inches in height, given by J. B. Stanhope, Esq., M.P., £5—Richard Milwall, Thurgarton Priory, Southwell.

Pairs of draught horses, not less than four years old, mares and geldings only eligible (by J. B. Stanhope, Esq.), £5—George C. Woodhouse, Wellingore, near Lincoln.

Hunting geldings or fillies, four years old, substance, and especially pedigree, to be taken into consideration, given by Henry Chaplin, Esq., £50—Jackson Everett, Park-lane, Doncaster.

Hunting foals, by a thorough-bred horse, the pedigree (if any) of the mare to be taken into consideration, given by Edward Heeneage, Esq., M.P., £5—Joseph Danby, Hibaldstow, Kirton-in-Lindsey.

Roadsters, not exceeding eight years old, nor fifteen-and-a-half hands in height, to carry sixteen stones, the quality of the animal being particularly taken into consideration, given by the Rev. Basil Berridge, £5—John West, Melton Ross, Ulceby.

PIGS.

JUDGES.—As for Leicesters.

Boars of a large breed.—First prize of £5 to Mr. R. E. Duckering, Northorpe, Kirton-in-Lindsey. Second, £2, Mr. John Dyson, Leeds.

Boars of a large breed, not exceeding twelve months old.—First prize of £3 to Mr. John Dyson, Adelphi Hotel, Leeds.

Boars of a small breed.—First prize of £4 to Mr. C. W. Graham, York-road, Leeds. Second, £9, Mr. L. T. Thornton, Lincoln.

Boars of a small breed, not exceeding twelve months old.—First prize of £3, Mr. C. W. Graham, York-road, Leeds.

Sows of a large breed, having had a litter since 1st March, 1865.—First prize of £4, and second prize of £2, to Mr. R. E. Duckering, Northorpe, Kirton.

Sows of a small breed, having had a litter since 1st March, 1865.—First prize of £4 to the Rev. B. Snow, Burton, Pedwardine, Sleaford. Second, £2, Mr. L. T. Thornton, Lincoln.

Three breeding pigs of the same litter, not exceeding six months old, of a large breed.—First prize of £3 to Mr. R. E. Duckering, Northorpe, Kirton.

Three breeding pigs of the same litter, not exceeding six months old, of a small breed.—First prize of £3 to Mr. John Lynn, Stroxtun, Grantham.

There were also some other extra and special prizes given for stock, poultry, and wool.

IMPLEMENTS.

The entries under this head numbered 723 articles, and a very great show they made. The trade, however, as it has been, we regret to say, throughout the year, was pronounced to be "not first-rate." As no prize list of the

implements was obtainable, we must be content with giving merely the names of the exhibitors and mentioning the sums offered as prizes. For reaping-machines of various kinds £54 in six prizes were offered by the society, but they have not yet been brought to trial. Hornsby's machines, although entered, were not on the ground, from some unaccountable delay of the Railway Companies, between Market Rasen and Plymouth, the Royal machines having been depended on for this show. There were also twenty-eight other prizes, amounting to £80, on offer, with £20 in addition placed at the disposal of the judges for distribution as they might see fit. These awards we will give with the decisions over the reapers, which will take place in a few days. The Tuxfords and Clayton and Shuttleworth trusted to local agents for any exhibition of their implements. Amies and Barford, with their more general manufactures and collection, made a great show with 40 different articles, many of them being effectively displayed in motion. Coultas, of Grantham, had several drills and hoes; for one of the former, for general purposes, we happened to see he was awarded the £4 prize. Richmond and Chandler also appeared, whom we also chanced to see were awarded the prize for chaff-cutters. Boutall, of Heybridge, Essex, had a large stand of machinery, with which a call was made here, on the road to Doncaster for this week. Hebb, of the Foundry Company, Market Rasen, and Hornsby, of Grantham, had a collection of ploughs of various sizes, and a steerage horse-hoe. The other manufacturers were Ashby and Jeffery, of Stamford, who had a large stand of their well-known articles; Ashley, of Louth; Ashton, of Horncastle; Barton, of Great Grimsby; Benson, of Stratton; Cannon, of Louth; Chapman, of Owmby; Bradford, of washing-machine celebrity; Brigham and Bickerton, of Berwick-on-Tweed, showing reaping machines, &c.; Dickinson, V.S., of Boston, non-poisonous sheep-dipping mixtures; Clark, of Lincoln, drills and other articles; Marshall and Co., of Horncastle. Besides these there were many other Lincolnshire village manufacturers; for this county is famous for its numerous and skilled local machinists. There were also a large number of agents on the ground; so that there is no fear of Lincolnshire being henceforth looking up and being well supplied with machinery.

THE ANNUAL DINNER

of the society was held in a marquee, in a paddock belonging to Mr. Goodson, of the White Hart, by whom a good dinner was provided, and served in a satisfactory manner. The president of the society, the Earl of Yarborough, occupied the chair.

So far as the speechifying went, it could not be expected that the minds of the country gentlemen would have settled down to home affairs so soon after a general election, and although politics are prohibited at this society's meeting, there is a way of closely shaving the teeth of the wind, which was done on this occasion, but in a very pleasant way, which indeed was unusually so, because brevity was the order of the day.

The Stewards of the yard and other officials, so far as we could see, did the best they could to make everything pass off pleasantly under the difficulties mentioned. One good idea, which was as courteous as it was happily hit upon, we must not forget to mention, as it may be followed perhaps with advantage in other small towns, where, on similar occasions, a large influx of visitors may take place. The Rev. F. R. Pentreath, Master of the De Aston Grammar School, placed at the disposal of the Stewards the many beds that nearly forty students require during term time. Thus, by the rev. gentleman's consideration and forethought, several visitors who arrived late at night were, with the help of his obliging and amiable lady, able to rest in comfortable quarters, when they would otherwise have had to sit in a corner, or sleep—that is, the weather being considered, lie two or three in a bed.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A CATALOGUE OF THE AGRICULTURAL IMPLEMENTS, &c., EXHIBITED AT THE
PLYMOUTH MEETING, IN 1865.

ALLCHIN AND SON, Northampton.

Seven-horse portable steam-engine £230, grinding mill £50, screw jacks 22s.

ALLOCOCK, T., Ratchliffe-on-Trent, Notts.

Horse hoes 45s. and 65s., grubber 75s., horse rakes £7 10s. and £8, carriage jack 25s.—Commended for horse-rake.

ALLEN, E. E., 40, Parliament-street, London.

Twelve-horse double expansive portable steam engine £230.

AMIES, BARFORD, AND CO., Peterboro'.

Land rollers £8 10s. to £24, garden rollers 70s. to £8 10s., steaming apparatus £14 to £26 10s., sack barrow and elevator 75s. and 95s., corn mills £20 and £27, four-horse portable steam engine £160.

ARNOLD AND ARNOLD, Plymouth.

Drilling machine 8 gs., pedomotive grindstone 60s., Gardner's double-acting turnip cutter £5 10s., oat crusher and bean splitter £5 15s., chaff cutters 45s. to 84s., machine made galvanized netting from 4d. per yard, Lloyd's flour mill and dressing machine £6 15s., compound-action butter churns from 27s. 6d. to 85s., and sundries.

ASHBY AND JEFFERY, Stamford.

Haymaking machines 11 to 16 gs., horse rakes £7 10s. to £10, wheel hand rake 40s., chaff cutters 50s. to £14, oilcake mills 65s. to £6, 4½-horse portable steam engine £135, eight-horse ditto £220, thrashing machines—four to five-horse £65, six to eight-horse £95, one-horse gear works 8 gs., rotating harrows 70s. to 6 gs., steel crank shields 12s. 6d. and 15s.—Commended for set of patent steel crank shafts.

AVELING AND PORTER, Rochester.

Agricultural locomotive engines—eight-horse £360, ten-horse £420, travelling rope porters 60s.

AVERY, J. G., 135, Regent-street, London.

Tabular churns (three specimens) 4 gs., 5 gs., and £7 10s.—Awarded silver medal for "Jebs's" tabular churn.

AYSHFORD, T. B., Fulham.

Dog cart £35, other carts 28 to 30 gs.

BADGER, J. AND W., Worcester.

Sets of diagonal lock-beam harrows 50s. to 80s., ditto scuffle drags 95s.

BAKER, JOHN, Ipswich.

Combined blowing and dressing machines (six specimens) £9 10s.

BAKER, T., Compton, Berks.

Portable cylindrical liquid manure carts £20 12s. and £24.

BALL AND SON, Rothwell, Northamptonshire.

Combined drill and presser £25, waggons £30 and £35, carts £14 to £16, horsehoes £2 12s. 6d. to £7 10s., horserakes £3 and £5 10s., grubber £3 10s., searifier £6 10s., harrows £4 10s., various ploughs £3 15s. to £4 10s., Clarke's patent scythes £6 per dozen.—Awarded second prize of six pounds for pair-horse waggon, and third prize of two pounds ten shillings for single-horse cart.

BAMLETT, A. C., Thirk.

Two-horse mowers £26 and £22 10s., one-horse mower £22, reapers £25 to £32, one-horse reaper £20, combined mowers and reapers £26 and £32.—Awarded third prize of five pounds for combined mowing and reaping machine.

BARBER, D. H., King-street, Liverpool.

Mower with flexible finger-bar, £22, two combined mowers and reapers £26.—Commended for combined mowing and reaping machine.

BARNARD, BISHOP, AND BARNARDS, Norwich.

Noiseless lawn mowers £2 10s. to £8s.; garden and park chairs, stools, and seats, 8s. 6d. to £2 15s., garden tables £1

2s. 6d. to £1 10s., galvanized wire netting 4½d. to 2s. 3d. per yard.

BARROWS AND CARMICHAEL, Bambury.

Portable steam engines—6-horse £200, 3½-horse £100, thrashing machine £70, finishing £105.

BAYLISS, JONES, AND BAYLISS, Monmore Green, Staffs.

Sundry hurdles 4s. 11d. to 13s. 3d., and 4s. 6d. per yard; continuous fencing 1s. 9d. to 2s. 11d. per yard, and self-shutting handgates £2 and £3, footpath gates £1 18s. 6d. to £2 12s. 6d., other gates £1 5s. to £1 16s., tree guards 16s. to 19s. 6d., self-relieving chain harrow £3 18s., garden stool and chairs 4s. 6d. to 17s.

BEACH, J., Dudley, Worcestershire.

Farinaceous food for cattle £1 5s. per cwt., meal for milch cows 15s. per cwt.

BEARE, H., Liverton, Devon.

Combined thrashing machines £13 10s. to £55, portable gears 7 gs. to £16, intermediate motion £3 chaff cutter 8 gs., turnip and mangold drill £9 10s.; combined sawing, boring, and tenoning machine £32; winnower £7 10s., clod crusher £9.

BENSON, MARTIN, St. Dunstan's Hill, London.

Pumps various £1 to £16 16s. 4d., fire and farm engine with hose complete £25 2s. 3d.

BENTALL, E. H., Maldon.

Chaff-cutters £2 5s. to 8 gs., root pulpers £3 15s. 6d. to 7 gs., turnip cutters £4 5s. to £5 17s., oilcake mills 3 gs. to 6 gs., corn and seed crushers 5 gs. to £10, two universal mills 5 gs., two oat kibblers 3 gs., bean mills £2 12s. 6d. to 3 gs., two-horse gears 8 gs. and 10 gs., with intermediate motions 3 gs., broadsliars 5 to 7 gs., and horsehoe £2 14s. 6d.

BEVERLEY IRON AND WAGGON COMPANY.

Liquid-manure distributors £17 and £22, watering apparatus £1 10s., portable pumps £5 15s. and 7 gs., three-horse reaper £42, two-horse reaper £37, waggons £29 10s. and £33, carts from £13 10s. to £17, cartwheels with axles £5 to £15, cloderushers £18 10s., plain roller £15 10s., compound action mill £20.—Awarded first prize of ten pounds for pair-horse waggon, third prize of two pounds ten shillings for two-horse cart, first prize of four pounds ten shillings for harvest cart, second prize of four pounds for market cart on springs; highly commended for "other waggons," for single-horse cart, and for market cart on springs.

BISSELL, W., Wolverhampton.

Vertical saw frame and engine £88, circular-saw bench £27, morticing machine £14 10s., combined planing machine £100, tenoning machine £50, lifting jack 80s., bench cramp 28s.

BLACKBURN, R., Exeter.

Traction engine and steam cultivator £350.

BLINKIRON AND HILL, Spalding.

Double-acting force pump or fire engine £19 10s. to £47 10s., farmer's force pump £35, hand fire engine £9, village fire engines £60 and £75, six lift pumps 21s. to 50s., and garden engines 30s. to 50s.

BOBY, R., Bury St. Edmunds.

Haymakers £14 and £14 15s., screeners and dressers £15, self-cleaning corn screens 7 to £15, gravel or lime sieve 47s. 6d. to 67s. 6d., malt screens £5 and 6 gs., sample screen 35s., barley hummeller £5.—Awarded third prize of four pounds for haymaking machine.

BOWDEN, J., Chagford, Devon.

Horsehoe 50s., horsrake £9, two-horse cultivator £6 10s., iron plough £5 10s.—Highly commended for single-row horse hoe on ridge and flat, and for single-row grubber.

BOWHAY, J. L., Modbury, Devon.

Corn drill £20 10s., seed and manure drill 16 gs., manure distributor 14 gs., grassmower £22 10s., reaper with manual delivery £24, combined reaper and mower £30, horseshoes 65s. and 70s., machine cart 16 gs., two-horse gear 8 gs., one-horse gear 6 gs., intermediate motions 3 and 6 gs., chaff-cutters 50s. to 6 gs., corn crushers 6 gs. and £8 10s., flour mill £6 10s., root pulpers £5 to 7 gs., turnip cutter 90s. and £5 10s., pair of rakes 9s. each, sheep rack 3 gs.

BRADFORD, T., 63, Fleet-street, London.

Variety of washing, wringing, and mangling machines 25s. to £45, three-roller mangle 90s. to £6 10s., new box mangle £11 10s., churns 40s. to £6 10s., butter-makers 21s. to 63s., cinder-sifter 15s. and 21s., and high-pressure vertical steam-engine.

BRAGGINS, J., Banbury.

Park gates and posts £15 10s., lodge gate 60s., entrance gates 50s. and 40s., field gate 27s. 6d., road gate 20s.

PRENTON, W., Polbathic, Cornwall.

Turnip drill 15 gs., ditto one-row £7, manure distributor £11, two-horse reaper with revolving cylinder £23, one-horse reaper £21, horseshoe 45s., tubular whippetrees 16s. and 18s. 6d.

BRIDGES, H., 406, Oxford-street, London.

Dairy articles 1s. to 10s.; impressions from butter prints.

BRINSMEAD, T., St. Giles-in-the-Wood, Devon.

Synchro-nal thrashing and reed-making machines £5 10s. and 8gs., self-exercising and nursing chairs 20s. and 30s.

BRITISH SEWING MACHINE COMPANY, 71, Oxford-street, London.

"Alexandra" elliptic lock-stitch 7 to 23gs.

BROWN, B., 43, Oakley-street, Lambeth.

Samples of the steel spring lever oil lubricators 1s. 6d. to 7s., vermin exterminator 1s. per box, fibrous meal cake for dogs 1s. per bag, concentrated poultry food 1s. per bag, dairy scales and glass weights and rosettes, the latter 1s. 6d. to 2s. per pair.

BROWN AND MAY, Devizes.

Portable steam-engines—8-horse £220, 2½-horse £75, combined thrashing machine £55, 1-horse "Cannon" pumping engine £235.

BUCKINGHAM JAMES, Bathpool, Cornwall.

Butterfly ploughs £5 10s. to £6 7s. 6d., turnshare plough £4 10s., cultivators £8 10s. to £11 5s.

BULLEY, R. B., Station-road, Plymouth.

Landau sociable £130, harouche £55, park phaeton £40.

BUNCE, J. S., Plymouth.

Longcloth shirts 77s. 6d. to 112s. per dozen, dress shirts 25s. each, spun silk shirts 15s.

BURGESS AND KEY, Newgate-street, London.

Mowers £15 to £25, self-raking and swath-delivery reapers £25 to £40, combined reaper and mower £25, centrifugal pump £94 10s., water lift £40, sack truck 18s., liquid manure pumps £3 15s. to £26 10s., mowing machines 12s. 6d. to 2gs., cask tilts 10s. 6d. to 16s., garden seat one guinea, garden table one guinea, American churns 40s. to 50s.—Highly commended for grass mower.

BURNARD, LACK, & Co., Plymouth.

Concentrated superphosphate of lime.

BURNEY AND Co., Millwall, London.

Liquid manure and water carts £17 10s., ditto cart body £4 10s., cistern to hold 400 gallons £1 10s., ditto 600 gallons £7, galvanized ditto 5d. to 9d. per gallon, cattle troughs 30s. to 55s., corn bins 45s. and 65s., strong hog trough 4s. per foot, pump trough 17s. 6d.

BURROW, J., Broadcliff, Devon.

One-horse reaping machines £16 to £21.

BURY AND POLLARD, Southwark.

Three-horse self-regulating wind engine £110, half-horse ditto £35, crushing mill £7 10s., agricultural pump £16, twisting apparatus £12 10s., conical boiler £9.

CALVEIT, F. C., Manchester.

Antiseptic fluid 2s. per gallon, smearing salve 1s. per lb., specific for foot-rot 1s. 3d. per lb., carbolic acid 1s. 6d. per lb.

CAMBRIDGE AND Co., Bristol.

Horseshoes £7 10s. and £8, press wheel roller and clod crusher £8 10s. to £14, chain and tine-and-chain harrows 57s. 6d. to 100s., two-wheel land presser 6gs., three-wheel ditto 8gs., two-horse gearwork and thrashing machine £24, winnower £9, washing machine 3gs., mangle £4 10s., wringer 25s.

CARR, T., Richmond-road, Montpelier, near Bristol.

Disintegrator for granulating conglomerated friable and unfriable materials £70.

CARSON AND TOONE, Westminster.

Horse-hoes 60s. to 85s., single-row grubber 70s., chaff-cutters 70s. to £9, horsegear 12gs., turnip cutters 90s., oil-cake crushers 3gs., cheese presses 55s. to £6.—Awarded first prize of four pounds ten shillings for single-row horse-hoe for ridge and flat, and first prize of six pounds for single-row grubber.

CARTER AND Co., Swan-lane, E. C.

Combined reaper and mower £30, screw-power reaper £30, agricultural carts for one horse 11gs., for two horses £16, harvest raves 40s. extra; market cart £16 10s., grubber 75s., chaffcutters 45s. to £7 7s. 6d., manure pump 55s., water carrier 55s., garden engines, lawn mowers, garden seats, &c., including metallic corn-bin japanned inside and out, to keep the corn free from vermin, and to hold four bushels for 25s.

CARTER AND Co., 237, High Holborn, London.

Collections of seeds, dried specimens, and growing in pots.

CHAMBERLAIN, W., Dodbrooke, Devon.

Horseshoes £6 10s. and 32s. 6d., grubber 2gs., cultivators 6gs. and £7 10s., common spade-plough 3gs. and 4gs., one-way ploughs 70s. and 77s., heavy drag 3gs., light drag 57s. 6d., ridging plough 55s., pair of light harrows 80s.

CHAPMAN, W., Apethorpe, Northhamptshire.

Light two-horse waggon £27, three-horse ditto £33, one-horse cart £14, two-horse cart for general purposes £15.

CHILDS, A. B., 481, Oxford-street, London.

Mowing machine £22 10s., double-furrow plough £20, circular-saw bench £10, carriage lifting jack 15s., combined cider mill and press £6, California lifting and force pump £5, broadcast seed sower 30s., washing machine 60s., clothes wringer 30s., revolving ditto 30s.

CLAY, C., Wakefield.

Cultivator and eradicator £6 15s. to 11gs., chain harrows 50s., horseshoes 47s. 6d. and 57s. 6d.

CLAYTON, SHUTTLEWORTH, AND Co., Lincoln.

Steam-engines—ten-horse portable £295, eight-horse £230, six-horse £200; ten-horse horizontal £240, thrashing-machines £97 to £120, grinding-mill £60, circular-saw bench £21, pair of pumps £50.

CLAYTON AND Co., Paddington.

Brick-makers £70 to £195; tile, pipe, and brick machines £28.

CLINTON AND OWENS, Whitefriars, London.

Variety of pumps 21s. to £23 10s., pump handle 50s., well-engine frames £9 and £18, pillar horse-gear £41 10s., hydraulic rams 5gs. to £30, Holman's fire engine £15, garden engines 35s. to £5 15s., water barrows £2s. 6d. to 52s. 6d., compact fire engine £65.

COLEMAN AND MORTON, Chelmsford.

Steam-cultivating apparatus £750, rope porter 60s., cultivators £6 10s. to £13 10s., water cart £20, potato digger £18, clod crusher £17, two-horse gear £13, samples of shares.

COLTHURST, SYMONS, AND Co., Bridgewater.

Faenimile of covering to Royal Flemish Farm with patent Roman tiles 11s. per square, ditto ridging tiles 4d. per running foot, ditto sheeting with eaves 4d. per foot run.

COOMBE, FERRIS, AND Co., 68, Mark-lane, London.

Millstones £11 and £13, cement stone £24, smut machine £15, flour dresser £33, flour mill and dresser £8, mill requisites, sack barrows 18s., steam and water gauges 27s. to £9, chronometers 50s. to 70s., set of three corn measures 46s. 6d., weighing machines 50s. and 70s., screw jack 40s., pair of pulley blocks 60s., Rushton blocks 37s. 6d., chaff cutters 42s. 6d. and 80s., corn and bean crushers 65s. and 45, and galvanized wire.

CORCORAN AND CO., 36, Mark-lane, London.

Silk flour dresser £95, wire ditto £36, smut cleaver £25, weighing machine 70s., chondrometer 32s. 6d., set of corn measures (bushel to a quarter) 33s. to 89s., corn meter's bushel 36s., and shovel 21s., maliklu floor of woven wire 1s. per square foot, model of malt kiln, corn-sample receiver 30s., sack truck 21s., samples of woven wire &c., a variety of mill-stones £8 to £22, seed screen 10gs., and sundries.

CORMELL, J., Cheltenham.

Liquid manure or water carts £11 to £30 15s., wrought iron cistern 24s. to £5, ditto cattle troughs 21s. 6d. to 67s. 6d., corn bin 48s., water cart and engine 90s., compact portable gas apparatus £20, gas meter £10, foliated iron work £5.

CORNES, J., Nantwich.

Three chaff cutters, £5, £7 10s., and £8 10s.

COTTAM AND CO., 2, Winsley-street, London.

Variety of stable fittings and requisites, pig and dog troughs 2s. 6d. to 10s., ventilators 1s. 6d. to 1s. 3d., corn bins 30s. to 3gs., glass lanterns 3s. 9d. to 15s., cast-iron pump 45s.

COULTAS, J., Grantham.

General purpose drills £24 and £35, fore-carriage steerage 70s. and 90s., corn drills £18 to £28, turnip and manure drills £25 and £28, ryegrass drill £26, manure distributor £14, horsehoe £9.—Awarded third prize of five pounds for corn drill, and third prize of seven pounds for two general purpose drills; also first prize of seven pounds for corn drill adapted to hill-side delivery, and second prize of seven pounds for turnip drill on the flat, as well as third prize of five pounds for drill on the ridge; highly commended for drill for small seeds, commended for general purpose drill and for corn drill for small occupations, also for dry-manure distributor.

CROGGS, R., 34, Wakefield-street, London.

Knife-sharpeners 1s. to 7s. 6d., wringers 12s. 6d. to 50s.

CRANSTON, W. M., 77, Upper Thames-street, London.

Haymaker for pony 12gs.

CUTHBERT AND CO., Bedale.

One or two horse reaper £22, two horse reaper £24.—Highly commended for one-horse manual reaping machine.

DAVEY, J., Crasthole, Coruwall.

Parallel expanding horsehoes with self-acting harrows £3 10s. and £4 2s. 6d., improved horsehoe with three tines £2, lever grubber £4, horse-rake £6 15s. 6d., turnwrest ploughs £3 12s. 6d. and £5 17s. 6d., general purpose plough £4 2s.; cultivator, grubber, and scarifier £11.—Highly commended for horse-rake and for single-row horsehoe on ridge and flat.

DAVY BROTHERS, Sheffield.

Portable steam engines—eight-horse £230, six-horse £200, steam hammer £80.

DAY, SON, AND HEWITT, 22, Dorset-street, London.

Stock breeders' medicine chest £2 12s. 6d., cattle medicine and pamphlets.

DELL, W. R., 72, Mark-lane, London.

Smut machines £55 and £12, mill stones £25 to £32, corn elevators £10.

DICKER, J. AND W., Chagford, Devon.

Reaping machine £22, mower for heavy crops £32, bin-bottomed cart 10gs., hand flour-dresser 5gs., cheese press 3gs.

DODGE, G. P., 79, Upper Thames-street, London.

Vulcanized indiarubber driving bands, hose, tubing, and double texture waterproof covers, these latter at £1 11s. 2d. to £3 11s. 2d.; gutta percha driving band, indiarubber bucket, deekle strap, ditching and moaling boots, driving aprons, capes, coats, &c.—Commended for set of indiarubber vulcanized driving bands.

DOWNE AND CO., Plymouth.

Shed or covering £9 10s.

DRAY, TAYLOR, AND CO., London Bridge.

Winnow and blower £9 10s., chaff-cutters £2 10s. to £1 15s., corn mill £15, crushing mill £4, harrows £3 10s. and £4 10s., weighing machines 2gs. and £3 15s., grindstone £2 12s. 6d., portable forge £2 16s., ditto bench and vice £2 12s. 6d., corn bin 27s. 6d., hames 7gs., American churns £1 6s. to £1 15s., Californian pump £7, lawn-mowers £4 10s. to £6 12s. 6d., self-adjusting scythes 10s. 6d. and 12s. 6d.,

sack trucks 15s. 6d. and 16s. 6d., 15-gallon farmers' boiler £3 5s., small grindstone £1, and a variety of garden seats and tables.

EASTWOOD, J., Blackburn.

Compound-action churns for one gallon 30s. to twenty gallons 90s.

EATON AND SONS, Thrapston.

Horsehoes 32s. 6d. and 37s. 6d., combined horsehoe and turnip thinner 6gs. and £10, sheep-crib and trough 22s. 6d., rack-bar lifting jacks 3 and 5gs., lever ditto 26s. and 27s. 6d., screw jacks 21s. to 25s., combined barrow and sack lift 35s. to 37s. 6d.—Awarded the prize of five pounds for horse-hoe for thinning turnips.

EDDY, J., Kenford, Devon.

Corn-drills £8 10s. and £16, grass-seed drill 3gs., horsehoes 45s., horse-rakes £8 and £9 10s., grubbers 60s., variety of ploughs 2gs. to 90s., pulverizer ploughs 75s. to £5, drags 70s., harrows 50s. to 75s., rotatory sifter £5, gravel screen 50s., draughts 16s. and 20s.

FOWLER AND CO., Leeds.

Complete sets of steam-ploughing and cultivating machinery £875, £750, and £693; ten-horse traction engine £150, traction waggon £75, seven-tined cultivator £70, extra strong five-tined ditto £75, steam harrows with slack gear £55, water cart £25, ten-horse portable engine £275.

FOX AND CO., Plymouth.

Door mouldings 5s. to 22s. per 100 feet, door and shutter 3s. 6d. to 10s. 6d. per 100 feet, base mouldings 11s. to 16s., facings 18s., astrigals 18s., architraves 22s. to 26s., skirting 10s. to 14s. 6d.; prepared boards grooved, tongued, and beaded, 9s. to 21s. per 100 feet run; ash cart and coach fellos 3s. 6d. to 11s. 6d. the set.

FOX AND WALKER, Bristol.

Steam-engines—eight-horse portable £230, ten-horse horizontal £120.

FREEMAN AND HARDON, Strangeways, near Manchester.

Patent feeding cake £9 and £11 per ton; "original" condimental food 25s. per cwt.

FREER, J., Rothley, Leicestershire.

Grain and seed planter £54, seed planter £20.

FRO, A. AND T., Bristol.

Seed and manure drill £6 12s. 6d., grass drill 65s., two-horse mower £22, one-horse reaper £18, haymaker £14, horse-rakes 30s. to 70s., one-horse carts £13 to £15, two-horse carts £16 10s., Haumann's harvest carts 16gs., cheese cart £21, winnowing machines £6 10s. to £8 10s., sheep rack 3gs.—Awarded third prize of two pounds ten shillings for harvest cart, and highly commended for haymaking machine.

GARRETT AND SON, Leiston Works, Suffolk.

Sixteen-horse portable steam-engine £120, ten-horse ditto £270, four-horse £170, combined thrasher and dresser £75 and £125, straw-bruiser £45.

GARDON AND KING, Exeter.

Cooking stoves 21s. to £27, Cobbet or wood-fire grate £5, crinoline guard grate 12gs., garden lounges 20s. to 32s. 6d., garden chair 12s. 6d., verandah chair 16s. 6d., garden engine £7 10s.; set of table cess-pits and other requisites; wire fencing; field-gate 40s.

GERRANS, W., Tregoby, Cornwall.

Corn and seed drill £18, land-presser drill 12gs., portable horse-rake £7, broadcast-sower £7 10s.—Awarded second prize of four pounds for land-presser drill.

GIBBONS, P. and H. P., Wantage.

Seven-horse portable engine £215, combined thrashing machine £112.

GIBBS AND CO., Half-moon Street, Piccadilly.

Collections of specimens of permanent grasses, agriculturals and other seeds, and also growing specimens in pots.

GILBERT, W., Shippon, Berks.

Corn drill £25, steerage £4, turnip and mangold drill £20, corn and seed drill £18 10s., one-row drill 2gs.

GLIDDON, J., Williton, Somerset.

Kitchen Ranges £3 3s. 6d. to £18, American kitchener 6gs., roasting apparatus £2 10s. and £4, heating stoves £1 12s. and £1 15s., iron bath £4 10s., saddle boiler

£4 10s., hot water coil 2 gs., force pump £4 10s., hydropult £1 14s. 6d.

Goss, J., Plymouth.

Stencil plate letters 9d. per letter, branding figures and irons 4d. to 1s. per letter, various kinds of type 1d. per letter.

GOUCHER, J., Worktop.

Several sets of drum-beaters £3 9s. to £3 19s. 8d., drum and concave £22 16s., three drum ends £1 2s. 6d.

GOULDING, W. and H. M., 108, Patrick-street, Cork.

Special manure £10 per ton, bone manure £7 per ton, superphosphate £6 per ton.

GOWER AND SON, Winchfield, Hants.

Variety of drills £2 16s. to £33, drill presser for two furrows 9 gs., broadcast seed machine £3 10s. and £5 15s., broadcast corn distributor 5 gs.—Awarded first prize of eight pounds for two-coulter ridge manure drill for turnips and mangolds, third prize of five pounds for two-coulter ridge drill for turnips and mangolds; first prize of six pounds for two-furrow drill presser, and commended for fifteen-coulter and thirteen-coulter corn and seed drills; also silver medal for broadcast seed distributor.

GRANT, J., 26, Cockburn-street, Edinburgh.

Copies of the *Scottish Farmer* 3½d.

GREEN AND SON, Leeds.

Four-horse steam-engine £85, lawn mowers £3 10s. to £24, garden rollers £2 10s. to £7 10s., garden seats £1 13s. to £2 7s. 6d., morticing machine £12 10s., wire sofa £1 12s. 6d., Green's pump £26 and £15, garden engines £2 19s. to £6 10s., sausage machines 2 gs. to £16.

GREENING AND Co., Manchester.

Assortment of wire fencing 4d. to 4s. 3d. per yard, straining pillars 30s. and £2, standards 18s. to 20s. 6d. per dozen, fencing wire 12s. 6d. to 35s. per cwt., hurdles 1s. 11d. to 12s. per yard, bar fence 1s. 11d. to 3s. 9d. per yard, gates and pillars, tree guards, garden seats, &c.

HARE AND Co., 31, Essex-street, Strand, London.

Specimen illustrations of machinery and prize medals.

HARVEY, T., Plymouth.

Sulphate of ammonia £4 per ton, potato manure 90s., wireworm destroyer 80s., cements 20s. and 40s. per ton, ichthyosaurus fossil £100, ammonite ditto £20, of other animals £20.

HAWKES, T., Tipton.

Manure and other drills £16 to £25, horsehoes 50s. and 70s., pulverizer ploughs £5 and £5 10s., general-purpose ploughs 70s. to 80s., corn crushers, £6 10s. and £12 10s., chaff cutters 45s. to £7 7s. 6d., Eclipse reaper 16 gs., carriage lifter 15s., butter machine 10s. 6d. and 2 gs., case of cattle oils 2s. each, cattle food 18s. per cwt.

HAYES AND SON, Stamford.

Waggons £29 to £44 10s., lorry £30, single-horse carts £14 and £14 10s., two-horse carts £14 to £15 15s.—Awarded the prize of ten pounds for light strong waggon, first prize of four pounds ten shillings for single-horse cart, first prize of same amount for two-horse cart, and second prize of three pounds for harvest cart.

HAYWARD AND Co., 84, Whitecross-street, London.

Farm fire-engine or irrigator £33, garden-engine ditto £9 10s. 2d., liquid-manure pump ditto £12, pump on plank 100s., three-way cock and a variety of other pumps and garden-syringes.

HEADLEY, Edward, Cambridge.

Drag-rakes 9 gs., cattle-troughs, 23s. to 65s., pig troughs 15s. to 27s., sheep troughs 21s. to 25s., wrought-iron manger 38s.

HEARDER, J. N., Plymouth.

Cooking and other stoves £5 to £14 10s.

HELLARD, R., Taunton.

Victoria self-acting side-delivery reaper £35, reaper with cranked bar £35.

HENTON AND SON, Westminster Bridge Road.

Elastic saddles £5 10s. to £10, saddle stands 12s., croquet or cricketing tent £5 10s.

HENWOOD, N., Tideford, Cornwall.

Manure distributor, with seed-box, £12 10s., self-acting sheaf-delivery reaper £30.

HILL AND SMITH, Brierley Hill, Staffs.

Expanding horsehoe 3 gs., skins £5 to £6, light land-roller 10 gs., rick-stands £5 to £30 10s., sheep racks 80s., sheep troughs 20s. to 30s., gravel screen £6 16s., wheelbarrows 27s. 6d. and 35s., heating barrow 60s., black varnish 1s. 6d. per gallon, wire netting 3d. to 7½d. per yard and 3d. per super-foot, garden seats 45s. to 55s., garden roller 50s. to 90s., tree guards 12s. and 21s., field gates 26s. 6d. to 70s., entrance gate and pillars £8 to £15, wicket gate ditto 37s. 6d., variety of sheep and cattle hurdles and fences; turnstile gate and bow 45s.

HILL, M., Holsworthy, Devon.

Five hunting saddles 4 gs. to £5.

HINDLEY, E. S., Bourton, Dorset.

Screw cider press £18 and £30, apple mill 14 gs., cider screws £5.

HOGG, W., Upton Pyne, Devon.

Two-horse reaper £20, wheat drill £18.

HOLMES AND SONS, Norwich.

Corn and seed drills £37 down to £17 10s., seed and manure drills £22 8s. 6d. and £21 10s. to £24 7s. 6d. and £24, "economical" ditto £15 2s. 6d., ridge roller drill £8, hand drills £2 and £2 15s., small 26-lever £22 18s. 6d., manure distributor £15 2s., broadcast sower £9 10s., horsehoe 10 gs., rotary harrow £10, six-horse portable engine £200, combined thrashing machine £120, circular-saw table £26 10s., corn dresser 9 gs., barley hummeller £4 10s.—Awarded the second prize of three pounds for corn drill for hill-side delivery, a silver medal for their new rotary barrows, and highly commended for corn drill for small occupations.

HORNSEY AND SONS, Grantham.

Various drills £17 10s. to £38 15s., drill presser 10 gs., manure distributor £13, horsehoes £3 to £13, grass mower £22, self-raking reaper £35, swathe-delivery ditto £31, chain-delivery ditto £23, one-horse ditto ditto 19 gs., drop-sheaf ditto 16 gs., eight-horse portable steam engine £235, combined thrashing machine £110, variety of ploughs £2 12s. 6d. to £5 1s. 6d., turnip cutters £4 10s. and £4 2s. 6d., root pulpers £4 12s. 6d. and £4 2s. 6d.; washing, wringing, and mangling machines £3 to 8 gs., india-rubber wringer one guinea.—Awarded first prize of ten pounds for general purpose drills, third prize of four pounds for corn and seed drill for small occupations, third prize of five pounds for turnip drill on the flat, first prize of six pounds for "small seeds" drill; second prize of eight pounds for improved mower of natural and artificial grasses, first prize of eight pounds for combined reaper and grass mower, third prize of five pounds for one-horse reaper with grated drop-sheaf apparatus, first prize of ten pounds for two-horse reaper with chain delivery, second prize of five pounds for two-horse reaper with grated drop-sheaf apparatus, and first prize of twenty-five pounds for self-acting swathe-delivery reaping machine; also highly commended for corn and seed drill, and for dry manure distributor.

HOWARD, J. AND P., Bedford.

Double-action haymakers 11 to 18 gs., horse-rakes £7 15s. to £10, steam-cultivating machinery, with the necessary anchors, snatchblocks, &c., including two 14-horse self-propelling steam engines, £1,250; traction waggon £50; travelling house £65; steam-cultivating apparatus, with 10-horse portable engine, £550; double-action steam cultivator £21, water cart £20, ridging body and subsoil tine for steam cultivator £3 15s., four-furrow steam plough £50, three-furrow ditto £65, set of steam harrows £22 10s., variety of ploughs £2 7s. 6d. to 10 gs., harrows £2 10s. to 6 gs., plough sledge £1 10s., scarifier £9, whippetrees 17s. 6d. to £2 10s., dynamometer 3 gs.—Awarded first prize of six pounds and second prize of five pounds for haymaking machines, and first prize of six pounds for horse rake.

HUMPHRIES, E., Pershore, Worcestershire.

Combined thrashing machine £93; six-horse portable steam engine £203.

HUNT AND PICKERING, Leicester.

Seed drills 18 gs. to £24, turnip drills £3 15s. to £6 10s., back steerage £4 10s., horsehoes 3 gs. to £8 10s., combined plough and scarifier £5, harrows £3 10s. and 4 gs., cultivator and grubber £7 10s., ploughs £4 to £5 10s., sack barrows 12s. 6d. and 21s., angle twitch rakes 3s. 6d., oilcake breakers £3

5s. to £6, corn crushers and kibbling mills £4 10s. to 8 gs., malt mill £5 10s., turnip slicer £3 15s., root pulpers £3 15s. to £4 10s., cheese presses £3 10s. and £3 15s., garden seats 15s. to £1 5s. 6d., garden table 25s., adjustable scythes 10s., milk can and carriage £2 15s., pair of garden vases £9.

HUNT, R. AND R., Halstead.

Clover and trefoil-seed drawer £50, one-horse gear £11 10s., corn and seed dresser £8 8s., turnip cutter 90s., disc root pulpers 75s. and 4 gs., root grater 4 gs., oilcake breakers 3 gs. and 95s.

HUTCHINGS, W. A., Exmouth, Devon.

Waggonette £84; dog cart £68 5s.

HUXHAM AND BROWN, Exeter.

Smut machine £16, set of one ton differential pulley blocks 50s., with chain 9d. per foot, lifting jack for four tons £6, to lift eight tons 8 gs., Biddell's combined mill £6, millstones £11 to £15 10s., Indian-corn mill 10s.

HUXTABLE, W., Ottery St. Mary, Devon.

Haymaker £10, horserake £8, two-horse reaper £18, pair-horse waggon £22.

IRELAND, J., Edward-street, Manchester.

Three-motion churns for four gallons 40s., to twenty gallons 90s.

JAMES, ISAAC, Cheltenham.

Liquid manure distributors, £13 to £26, street water cart £22, liquid manure pumps 55s., india rubber suction pipe 3s. per foot, gapping drills 10s. 6d., mortar temperer 7gs.; washer, wringer, and mangler £5 to £9; clother dryers 38s.

JOHNSTON, P., 290, Oxford-street, London.

Butter churns, to make 2lbs. 18s., ditto 25lbs. 65s., mangle 10gs., butter prints 6d. to 5s., case of butter knives and beaters 1s. to 5s.

JONES, J. M., Gloucester.

Leather composition 1s. per box; foot rot specific 2s.

KEARSLEY, H., Ripon.

Grass mower £22 10s., reaper with back delivery £22, one horse reaper 16 gs., combined reaper and mower £26 10s., hay-maker 15 gs.—Received third prize of seven pounds for grass mower, and highly commended for combined reaper and mower.

KITMER, B., Fulston, Linc.

Combined blower and dresser £9 (two specimens).

LAMOUREUX, CLARK, AND CO., Plymouth.

Miscellaneous collection of seeds for farm and garden culture.

LARKWORTHY AND CO., Worcester.

Combined horsehoe and grubber 85s., variety of ploughs 65s. to 95s., "excelsior" harrows 45s. to £6, scuffle drags 35s. to £5, whippetrees 15s.

LEBLANC, D. F., 102, Fleet-street, London.

Diophtical water-gauge tube for steam boilers 3s. to 40s.

LEWIS, G., Kettering.

Steerage corn and seed drill £16 10s., steerage lever horsehoe 7 gs.—Highly commended for small occupation corn drill.

LUKE, W. H., Plymouth.

Printing machine by Hartill, paper-cutter by Dawson, and table.

LUXTON AND CO., Hatherleigh, Devon.

Two-horse light reaper £18, corn drill £18, turnip or manure drill £8, winnower £7 10s., hay-turner £7 10s., horserake £9, combined thrashing and winnowing machine £50, double moulding and drilling plough 50s., chaff cutters 6 and 8 gs., corn and seed crushers 5 and 8 gs.

LYON, A., Windmill-street, Finsbury.

Mincing machines 10s. 6d. to £6 10s., chopping boards 4s. and 6s. 6d., tobacco cutters 1s. 9d. to 2s. 6d., cucumber slicers 1s., bread-cutters 16s., apple-parer 8s. 6d., whipping can 3s., kitchen knives 1s. 8d., sausage-meat forcers 20s. to 40s., root pulper £7 10s., canteen 8s. 6d., vegetable cutters 4s. 6d.

MACNAUGHT AND SMITH, Worcester.

Landau £220, Whitworth dogcart £55, and Malvern dogcart £48.

MCNEILL AND CO., Bunhill-row, London.

Asphalted roofing felt 1d. per square foot, bituminous felt

1d. per foot, hair felt 7d. to 1s. 3d. the sheet, rubber compound for steam joints 8d. to 1s. the set, and models.

MANCUR, E., 174, Fleet-street, London.

Butter cleaner 10s. 6d. to 20s., scales 5s. to 60s., nose ring 4s., wringer 10s. 6d. to 2s., stable door detector 2s.

MAPPLEBECK AND LOWE, Birmingham.

Chaff cutters 45s. to 10 gs., oilcake breaker 3 gs., turnip cutters 4 and 5 gs., cheese press 50s., mangles 70s. and 10 gs., weighing machines 2 to 5 gs., chain harrows 35s. to 70s., tormentor 45s. to 50s., grindstone with treddle 45s., road scraper 70s., drills 52s. 6d. to 90s., corn bins 32s. to 44s., emigrant's or farmer's tool chest 45s., portable forge 4 gs., smith's bellows 3 gs., anvil 28s. per cwt., staple vice 11s. and 20s., arms and boxes 28s. per cwt., mail axles 25s. and 27s. 6d., horseshoes 2 gs., pulley blocks 7s. and 3 ts., hurdles £10 15s. per ton, lifting jacks 25s. to 10 gs., lifting crab 55s. and £6 7s. 6d., granary crane £7 10s., galvanized buckets 2s. 6d. to 3s. 6d., hop press 2 gs., sack cart 9s. 6d. to 16s. 6d., drag rakes 8s. 6d. and 12s. 6d., wire strainer 2 gs., bundle of wire 14s. per cwt. of 300 yards, set of hames 26s. 6d. to 36s. 6d., spades 3s. 3d. to 4s. 6d., shovels and cast steel digging and manure forks 3s. to 4s. 6d., hay forks 1s. 9d. to 3s. 6d., set of draining tools 39s., patent spades 3s. 3d. to 5s. 6d., weather vane 55s., metallic churns 26s. to 37s. 6d., garden engine £5, stack ventilator 3 gs., dynamometer 50s., garden seats 17s. 6d. to 39s., vermin traps 6s. to 30s., garden syringes 4s. 6d. to 14s.

MARSHALL, W., Upton Pyne, Devon.

Two-horse waggon £26, light ditto £24, plank side cart £14, light one-horse cart £12 10s.

MARSHALL AND SONS, Gainsborough.

Portable steam engines—nine-horse £251 5s., five-horse £181 5s., combined thrashing machines £92 and £140.

MAUNDER, J., Ottery St. Mary, Devon.

Reaping machines with side or back delivery £21.

MAYNARD, R., Whittlesford, Cambs.

Chaff engine £42, additional wheel with four knives £3 5s., instrument for changing ditto 3s., riddle ditto 14s., six-horse portable engine £208.

MELLARD, F., Uttoxeter, Staffs.

Cheese-maker £13 15s., cheese press £3.—Awarded silver medal for "Pugh's" patent cheese-making machine.

MELLARD, J., Rugeley, Staffs.

Turnip and mangold seed drill 6gs., ridging plough £3 10s., grubber and horsehoe £3, horsehoe with revolving harrow 30s., chain harrow £3, disc pulpers £3 10s. to 5 gs., corn-crusher £4, chaff cutters 2 gs. to 10 gs., oilcake breakers £2 15s. and £5, carriage jack 12s., curd mill £1 14s., cheese presses £2 17s. to £5.

MERRYWEATHER AND SONS, Long Acre, London.

Light steam fire engine £400, Paxton fire engine £112, hand fire engine £30, reel, fire-pump, and fire bucket.

MILFORD, G., Thorverton, Devon.

Pair-horse waggons £22 and £27, one-horse cart £11, two-horse cart £13 10s., harvest cart £14, market cart £14.—Commended for pair-horse waggon and two-horse cart.

MILFORD, F. P., Kenn, Devon.

Two-horse tipping waggon £28 10s., ditto for general purposes £23 10s., Leeds one-horse carts £14 10s., Plymouth harvest cart 12 gs., general cart £11 10s., two-horse farm and road cart £16, harvest cart 19gs., lifting jacks 15s. and 17s. 6d.—Highly commended for two-horse cart.

MILFORD AND SON, Thorverton, Devon.

Pair-horse waggon £24, three or four-horse waggon £29, two-horse tipping waggon £37, one or two-horse waggon £21, corn lades £1 extra, one-horse cart £14, two-horse cart £13 10s., harvest cart £12 10s., market cart 19 gs., lifting jack 25s.—Awarded second prize of six pounds for pair-horse waggon, commended for "other waggons"; second prize of three pounds for two-horse cart, and commended for single-horse cart.

MOORE AND CO., Upper Marylebone-street, London.

Tool sharpeners 1s. to 2s. 6d., water gauge glasses 4s. 3d. to 6s. 6d. per dozen lengths, sleep marks 1s. to 5s. each.

MORRISON AND CO., Liverpool.

Self-acting winding straining pillar 45s. and 32s. 6d., wire fence and telegraph £155 to £156 per mile, wire fencing 4½d.

to 6s. per yard, tie post 27s. 6d., gates 13s. to 75s., lightning conductor 1s. 6d. to 1s. 10d. per foot, barn roof £70, iron cottage £135, country house £400 to £500; ornamental church; farmyard roof £378 to £390 to cover 100 by 100 feet.

MUDFORD, G., South Retford, Notts.

Stack &c. covers 1s. 6d. to 2s. per yard, tents and marquees 2s. per yard, machine belting 1s. 6d. per lb., cocoa matting 1s. 6d. to 2s. per yard.

MUSGRAVE, BROTHERS, 59, High-street, Belfast.

Full-sized horse stalls 87s. 6d. to £8 15s., variety of stable fittings and of double-stall cowhouse, iron piggery £13 10s., piggery yard £7 15s., piggery front 95s., slow combustion stoves 70s. to 100s., conservatory stove with vapour chamber.

NEIGHBOUR AND SONS, 127, High Holborn, London.

Beehives 5s. to £10 14s. bees included, bee dress protector 5s., artificial combs 6s. per dozen, honey cutters 5s. per pair, pressing roller 7s. 6d., bottle feeder 2s. 6d., fumigator 2s. 6d., fungus 1s. per packet, indiarubber gloves 5s. 6d. per pair, bee feeding trough 5s.

NEWTON, WILSON, AND CO., 144, High Holborn, London.

Variety of sewing machines 2 to 16 gs.

NICHOLSON, W. N., Newark.

Haymakers 10 to 15 gs., horse-rakes £7 10s. to £11, oilcake breakers 60s. to 100s., land rollers 12 gs., sack elevators 52s. 6d. to 73s. 6d., ditto and weighing machine £5 15s. 6d., winnower £10, elevating apparatus for sacking corn from winnower 73s. 6d., portable steam engine £115, garden rollers 65s. to £7, wine and bottle racks 18s. and 30s., block-tin malt and grain shovels.—Highly commended for haymaking machine.

NORRINGTON AND CO., Cattle Down, Plymouth.

Samples of manure £6 5s. to £10 per ton, saddle-girth 12s. 6d., Peruvian guano £13 5s. per ton, linseed cake £12 10s. per ton.

NUNN, J. P. AND E. B., Royston.

Drill for small seeds £16 10s., self-cleaning horseshoe £12 and single-row grubber 60s.

NYE AND CO., 373, Oxford-street, London.

Mincing and sausage machines 12s. 6d. to 42 gs., small mills 6s. to 20s., rotary knife cleaners 40s. to £10 5s., taps 1s. 6d. to 2s., vegetable cutters and slicers 20s.

OLDHAM AND BOOTH, Hull.

Bone mills £47 to £200, bone and dust mill £90, eight-horse single-cylinder portable steam-engine £230, steam winch £67 10s.

PAGE, R., Morehard Bishop, Devon.

Two-horse reaper £20, one-horse ditto 16 gs., corn drill £20, winnower £9, reed-maker £6 10s.

PAGE AND CO., Bedford.

Turnip and mangold horsehoes 2 gs. and £2 10s., Leeds prize horseshoe £2 15s., combined horseshoe, five-time grubber, and moulding plough, £4 15s.; hay, corn, and stubble rakes £7 10s. to £10; field roller £7 15s., pipe and tile machines 13 gs. to £20, one-horse gear work £12, chaffcutters £2 10s. to 11 gs., disc roller pulper £4 10s., linseed cake mills £3 5s. and £3 15s., various ploughs £2 7s. 6d. to £4 5s., four-wheel scufflers 5 and 6 gs., sets of harrows £2 7s. 6d. to £4, whippetrees 7s. 6d. to £1 6s., bench drilling machine £7.—Awarded second prize of three pounds for single-row horseshoe on ridge and flat, and second prize of four pounds for horse-rake

PARHAM, W. Bath.

Fences 7d. to 3s. 3d. per yard, hurdle fencing 7s. per yard, gate and pillars £2 10s., tent 10 gs., gates £1 2s. 6d. to £25.

PARKES AND CO., Birmingham.

Draining tools £1 10s. to £1 18s. per set, digging forks 3s. 6d. to 5s., other solid cast-steel forks 1s. 9d. to 15s., spades and shovels 1s. 3d. to 4s. 6d.; axes, hatchets, choppers, hooks, trowels, hammers, and hoes, from 1s.

PARKIN, F., Exeter.

Cider press £22, screw and nut with two levers £8 10s., apple-breakers 16s., garden chairs 16s. to 2 gs., Cobbett stone £5.

PARSONS, G., Martock, Somersetshire.

Eight-horse portable engine £225, 2½-horse ditto £63, flax-reaker and scutcher £63, flax-seeder 7 gs., one-horse cart

11 gs., travelling wheels £7 15s. down to £6 per pair.—Awarded silver medal for combined flax-breaking and scutching machine.

PEIRCE, A. E., 75, Bridge Road, Hammersmith.

Cattle troughs £1 2s. to £3 5s., sheep troughs 17s. 6d. to £1 10s., pig troughs 9s. 6d. to £1 6s., sheep cage 12s., portable fence £3 5s., water cart or fire engine 16 gs., rotary pump or ditto £5 7s. and delivery hose 1s. 2d. per foot, tubular wheelbarrow 30s., "eclipse" portable piggery £7, "excelsior" shepherd's house £18, corn screens £5 10s. and £9 5s., spare screen cylinders £2 and £2 10s., noiseless winnowers £8 and £9, sack holder 25s.—Awarded silver medal for improved cattle troughs.

PENNEY AND CO., Lincoln.

Corn separators 12 gs. to £21, malt screen £1 10s., grave or lime screen 30s., sack lifter £2 12s. 6d., meat safes £1 to £2, game or poultry netting £1d. to 6d. per yard, garden sofa £2, ditto chairs 15s. and £1, ditto stools 4s. 6d. and 7s. 6d., ditto baskets 1s. and 7s. 6d., corn screens 11 and 13 gs., set of six japanned wire dish covers £1 4s.

PETHICK, J., Tamerton Foliot, Devon.

Hand winnower £10, two-horse farm cart 10 gs.

PHILLIPS, E. A., 8, Southampton Buildings, Chancery Lane, London.

Rotary spade or digger £50.

PHOSPHO-GUANO COMPANY, London and Edinburgh.

Phospho-guano in its raw and prepared condition, and specimens of grain and other produce raised by its aid alone.

PICKSLEY, SIMS, AND CO., Leigh.

Chaff cutters 43s. to £24, oat and bean crushers 65s. to £15, steel mills 90s. to £15; gorse bruiser £18 10s.; turnip cutter, slicers, and pulpers 85s. to £7 10s., oilcake breaker 65s., lawn mowers £5 to £6 10s., wringing and mangling machines 55s. to 75s., two-horse mower £22, ditto reaper £22 10s., one-horse reaper £21, horse-rakes 32s. 6d. to 45s., two-horse gear £9 10s., rasping mill £60, grinding apparatus 50s. to 95s. 6d., six-horse horizontal steam engine £160, four-horse vertical ditto £115, drag-rake 11s. 6d. and 18s., twitch and stubble rake 4s., whippetrees 10s. 6d., sundry garden chairs, sack trucks, pig troughs, hay and manure forks, with two-horse vertical steam engine £35.—Awarded third prize of five pounds for two-horse reaper.

PITTS, THOMAS, Plymouth.

Odam's superphosphate of lime 5 gs. per ton, prepared guano £9 10s., blood manure £7, dissolved bones £7, concentrated phosphate £8 15s., special potato manure £7 10s.

PLENTY, E. P., Newbury.

Water or liquid manure carts 11 gs. to £18 10s., galvanized iron pump £4, ditto sheep troughs 20s. to 45s., cattle trough 36s., lamb trough 18s.

PLIMSAL BROTHERS, Plymouth.

Various ploughs 2 to 7 gs., wheel hand rakes 40s., horse rakes 5s., and £8, drag rake, 18s., haymaker £8, lawn mowers 90s. and £7 10s., combined mower and reaper £26, one-horse "eclipse" reaper £17 6s., winnower £7, harrows 40s. to 80s., scuffle drag 4 gs., whippetrees 15s., corn mills 3 gs. and 87s. 6d., combined mill 9 gs., corn crushers 5 gs. to £6 10s., linseed cake breaker 70s., turnip cutters 85s. and 3 gs., chaff cutters 15s. to £10 19s., seed drill £20, sack barrows 12s. and 14s., set of corn measures 37s., seed distributor 50s., scythies 10s. and 13s., and variety of miscellaneous articles.

PONTEY, M. L., Plymouth.

Specimens of seeds, roots, and trees.

PORTER AND CO., Lincoln.

Coal gas apparatus £45, corrugated shed for ditto £20.

POWIS, JAMES, AND CO., Lambeth.

Combined mortising machines £16 to £36, circular-saw benches £21 to £60, endless-hand sawing machine £38, general joiner £75, tenon-cutter £75, floor-board planer £175.

POWIS AND CO., Milwall Pier, London.

Mortising machines £16 and £21, hand-sawer £38, joiner £90, saw benches £19 and £70, brickmaker £200.

PREECE, T., Leominster.

Corn drills 5 to 21 gs., mangold drills £2 10s. to £5 15s., horseshoe £2 10s., grubber 3 gs., corn drill £28.

PRIEST AND WOOLNUGH, Kingston, Surrey.

Lever drills £16 8s. to £37, turnip and manure drills £19 to £26, grass seed drill £24, manure distributor £16 10s., horse-hoes £14 to £19.—Awarded the first prize of ten pounds for general purpose drill, second prize of seven pounds for lever corn drill, second prize of five pounds for corn drill for small occupations, first prize of eight pounds for drill for turnips &c. on the flat, second prize of seven pounds for drill for turnips &c. on the ridge, and second prize of four pounds for drill for small seeds; also highly commended for general purpose drill, and received the second prize of five pounds for horsehoe for general purposes, and the second prize of seven pounds for dry manure distributor.

PUCKERING AND Co., Beverley.

Leeds prize market cart £21, other carts £18 10s., £25, and £32, dog-cart £45, waggonette £45 and £120, saddle stands 12s. 6d., single-horse harness 13 gs., penholders 1s. each.

RANSOME AND Co., 31, Essex-street, Strand, London.

Long's non-poisonous specific for cure of scab in sheep 4s. 6d. per gallon, ditto for killing ticks in sheep 2s. 8d. per gallon, concentrated non-poisonous eradicator 4s. per gallon, non-poisonous sheep-dipping composition 1d. to 1½d. per head, dressing fork and sheep skins with fleeces.

RANSOMES AND SIMS, Ipswich.

Variety of ploughs £2 7s. 6d. to £7 5s., potato-raising body £1 17s. 6d., ridging body £1 17s. 6d., digging body 7s. 6d., whippetrees £1 5s. and £2 10s., poletrees 12s. 6d., sets of harrows £4 5s. and £1 10s., corn screen £15, root pulpers £4 14s. 6d. and £7, bean cutter £4, steel mills £3 15s. to 9 gs., universal mill £13 10s., two-horse iron gear £4 5s., lawn mowers £6 10s. to 4s., eight-horse power portable steam engine £230, combined thrashing machine £136, ninety-gallon feeding pan £3.—Awarded silver medal for semi-circular poletrees.

RAYNBIRD AND Co., Basingstoke.

Collection of samples of seeds and new cereals, oilcakes, and manures.

READING IRON WORKS COMPANY.

Haymaker £15, horse rakes 7 gs. and £8 10s., eight-horse fixed steam engine £95, eight-horse portable £230, six-horse portable £195, three-horse ditto £120, thrashing machines £75 and £110, perforated beater drum £8 10s., portable thrashing machine and horse-gear £41, portable grinding mill for horse-power £66, circular-saw bench £25 10s., chaff-cutters £2 5s. to 12 gs., oilcake mill 3 gs., barley-horner £4 15s., two-horse gear £12 5s., grass and seed broadcast sowing machine 3 gs., combined sack cart and holder £1 11s. 6d.

REEVES, R. AND J., Westbury, Wilts.

Manure, corn, and seed drills £25 5s. to £37 5s., corn drill £31 10s., ditto and bean planter £32 10s., corn and seed drill for small occupations £18, other drills £12 to £31 10s., manure distributors 10 gs. to £17, water cart £15, harrow pump £6 11s. 4d., winnow 10 gs., corn screens £5 10s., thistle destroyer 10s.—Awarded the prize of ten pounds and first prize of eight pounds for liquid manure corn and seed drill on the ridge, and second prize of seven pounds for four-row liquid manure and seed drill on the ridge; highly commended for four-row manure and seed drill on the flat, also on the ridge, and commended for general purpose drill.

RICHES AND WATTS, Norwich.

Eight-horse portable engine £236, grist mills £15 to £27, corn mills £7 10s. to £12, chaff-cutter £8 10s.

RICHMOND AND CHANDLER, Salford.

Chaff-cutters £2 10s. to 18 gs., corn crushers 5 gs. to £11 16s., two-horse driving gear £16 10s., four-horse ditto £24, root washer 4 gs., turnip cutter £3, steaming apparatus £6 9s., sack holders £1 3s. and £1 12s., bread kneaders £5 and £25, oat and bean crusher £16 6s., four-horse steam engine £165.

RIDLEY AND Co., Grantham.

Eight-horse portable engine £220; ditto combined thrashing machine £110.

ROBERTS AND SONS, Bridgewater.

Market carts 10 gs. to £14, Malvern dog carts £21 to £26, Whitechapel ditto £20 to £26, waggonette £55, and a set of dog-cart harness £7 10s.

ROBEY AND Co., Lincoln.

Eight-horse portable steam engine £230, combined thrashing machine £115, self-acting circular-saw bench £65, portable mill £25.

RUSTON, PROCTOR, AND Co., Lincoln.

Portable steam engines—eight-horse £230, six-horse £200 four-horse £165, thrashing machines £105 and £118 10s. portable mills £75 and £119, circular-saw bench £14 10s. to £45, centrifugal pump £52 10s.

ST. PANCRAS IRON WORKS COMPANY, Old St. Pancras-road, London, N.W.

Unerring gate latch 4s. 6d. to 5s. 6d., iron field gate and posts £3 9s. 9d.; models of stalls, loose boxes, and variety of stable fittings; full-sized model of cow stall £2 7s. 6d. per cow iron piggery £4 5s. and £4 10s., chaff cutters 4s. 2d. to 7s. 11d., pair of hurdle field gates £1 5s., wired hurdles, running fences, and tree guards.

SAINTY, J., Burnham, near Lynn.

Corn and seed drills £16 10s. and £28 10s., lever horsehoe £16, manure distributor £16 10s.

SAMUELSON AND Co., Banbury.

Self-raking reaper £30 and £35, meadow mowers £20 and £21 10s., combined reaper and mower £23 and £26, "Eclipse" reapers 16 gs., haymaker £14, turnip cutters 5 gs. and £4 5s., root pulpers £4 5s. and £4 10s., chaff cutters £2 8s. to £10, lawn mowers £4 10s. to £7 10s., and linseed-cake breakers £3 and £3 10s.—Awarded second prize of seven pounds for one-horse reaper, and second prize of fifteen pounds for side-delivery reaping machine.

SAWNEY, W., Beverley.

Horsehoe £5 10s., winnower £6 5s., combined winnower and blower 10 gs. and £11, treadle grindstones 44s. and 52s., treacle boot cleaner 2 gs., bread-cutter, riddles 40s. and 50s., sack lifter and tilter £3 10s. and £3 18s., cinder sifters 50s.

SCRAGG, T., Calveley, Cheshire.

Pipe, tile, and brick maker, £21.

SHARMAN, W., Melton Mowbray.

Hay or corn rakes 1s. 6d. to 16s. 6d., drag rakes 10s. to 16s. 6d., stubble rakes 4s. and 5s., scythe sheaths 5s. 6d. to 9s. 6d., flour bin 18s. to 25s., sack trucks 14s. and 16s., strained wire fencing 14s. per cwt., bundles of wire stretches 15s. 6d. each.

SHAW, JOHN, New Wortley, Yorkshire.

Flexible lawn mowers 70s. to £11 10s., and Gardner's turnip cutters 4 to 5 gs.

SIMPSON'S CATTLE SPICE COMPANY, Hull.

Cattle spice 5s. per canister and 70s. per barrel; digestive powders 1s. per packet.

SKELTON, J., Bodmin Hill, Cornwall.

Two turnwest ploughs £5 10s. and £6 with skim coulters.

SMITH, WILLIAM, Kettering.

Steerage horsehoes £8 to £9 10s., useful horsehoe £6 10s., single-bar horsehoe 80s., winnowing and blowing machines 9 gs.—Awarded third prize of four pounds for general purpose steerage horse-hoe, and third prize of two pounds ten shillings for single-row horse-hoe for ridge and flat.

SMITH, BROTHERS, Thrapston.

Haymaker 15 gs., horse-rake £7 12s., grist mills £5 to 15 guineas, bean mill 50s., and oilcake mill 65s.

SMITH AND Co., Liverpool.
Palm-nut meal £6 per ton.

SPONG, J. O., 45, Mortimer Road, London.

Sausage and mincing machines 10s. 6d. to 4 gs., wring 12s. 6d. to 30s., domestic articles from 1s.

STEPHENSON BROTHERS, Plymouth.

Chaff-cutters 45s. to £10, corn crushers 5 gs. to £6 10s., turnip cutters 85s. 6d. to £5 8s. 6d., root pulper 75s. 6d., lawn mower £6, garden engines 55s. to £5 10s., syringe 8s. 6d., garden roller 2 gs., set of corn measures 31s., lift pump 30s., manure pump 55s., washing machines 70s. to £6 14s. 6d., lever weighing machines 58s. to 84s., asphalted roofing felt 1d. per foot, flower stand 75s., kitchen range £11, ice producer 25 gs. to 65s., refrigerators 50s. and 75s., ice safe £7, freezing compounds in cases 11s. and 22s., cooking apparatus 38s., to £22, Cobbett's stove 5 gs., laundry boiler 55s., pig troughs 3s.

to 20s., galvanized netting 5d. to 1s. 3d. per lineal yard, sheep shears 3s. and 4s., filling axes 2s. to 5s. 6d.

SUMMERSCALES AND SON, Keighley, Yorkshire.

Variety of washing, wringing, and mangling machines 65s. to £9, sugar cutter 12s., parallel vice 80s.

SUTTON AND SONS, Reading, Berks.

Collections of seeds and dried specimens, also growing specimens and paintings.

SILVESTER, 3, Sheffield-street, London.

Cow milker 10s. the set, siphon 1s. to 2s. 6d., tube cleaner 1s. to 21s., wringer 1s. to 3s. 6d., turnip cutter 1s. to 2s. 6d.

TASKER AND SONS, Andover.

Corn and other drills £20 10s. to £43, drill presser £15, sets of trussed beam harrows 3 gs. to 90s., scuffle drags £5, winnower 10 gs., corn elevators 5 and 6 gs., eight-horse portable steam engine £233, thrashing machines £55 to £130, screw jack 2 gs., set of tubular iron whippetrees 14s.

TOMAS, WM., Wellington, Somerset.

Bricks 25s. to 40s. per 1000, drain pipes 3d. to 7d. each, and smaller bore 22s. 6d. to 90s. per 1000, roofing tiles 30s. to £6 10s. per 1000, chimney tops 2s. to 6s. each, vases 2s. to 6s., ridge tiles 2s. 6d. to 4s. 6d. per dozen, &c.

TINKLER, R., Penrith.

Various churns 70s. to £5 15s., hay and garden rakes 1s. 6d. each, winnower £9, horseshoe 75s. to 90s., land grabbers 70s. and 75s., double plough 94s.—Awarded second prize of four pounds for single-row grubber, and commended for single-row horseshoe for ridge and flat.

TOPHAM, C., 31, Bush-lane, London.

Sausage makers 10s. 6d. to 50s., masticators 12s. 6d. to 21s., dairy and domestic utensils 1s. upwards, tube brushes 1s. to 4s. 6d., grindstone and frame 3 gs., boot cleaner 3 gs.

TROTTER, W., South Acomb, Northumberland.

Flexible reaper £25, mower £20.

TURNER, E. R. AND F., Ipswich.

Four-horse portable engine £161, crushing mills 3 gs. to £15 17s. 6d., corn mills £23 and £35, crane £5 10s., oilcake breakers 70s. and 95s.

TURNER'S STRAP AND HOSE CO., Greenfield, Lancashire.

Rolls of driving straps 2½d. to 8s. 7d. per lineal foot; leather hose 2s. 6d. per foot.

TURNER AND CO., 13, Rose Terrace, Fulham Road, London, S.W.

Sausage maker 17s. 6d. to 5 gs., masticator 15s., mincer 10s. 6d., washing machines 5 gs. to £9, kitchen dagger 1s.

TUXFORD AND SONS, Boston.

Portable steam engines—eight-horse £250, one-horse £60, two-horse £90, three-horse £115, ten-horse £270, twelve-horse £330, ten-horse farmer's self-propelling locomotive for cultivating and farm-yard purposes £400, ten-horse steeple engine £255, combined thrashing machine £120, straw elevator £48, portable mill £45, Appold's centrifugal pump £30 and £52, circular-saw table £20 and £23 10s., binding spring for holding deals 54s., circular-saws 50s. to £9, lifting jacks 30s. to 40s.

TYE, JOHN, Lincoln.

Corn mill 70l. and 145l., pearl barley mill 30l. 10s., smut machine 37l., crane for lifting millstones 6l., French burr millstones 8l., grey mill stones 90s. and 6l., mill chisels 1s. 3d. per lb.

UNDERHILL, W. S., Newport, Salop.

Turnip drill 95s., patching ditto 8s. 6d., ryegrass 70s., drill press 6l. 10s., horse-hoes 27s. 6d. and 33s. 6d., grabbers 50s. and 60s., lever horse rakes 6l. 10s. and 7 gs., six-horse portable steam engine 180l., combined thrashing machine 110l., combined sawing machine 95l., corn elevators 5 to 6 gs., cultivators 95s. to 8l., ploughs 55s. to 72s. 6d., harrows 52s. 6d. and 60s., hand cart 70s., sheep rack 35s. and 45s., sheep troughs 17s. 6d. and 28s., cow crib 34s. 6d., cattle trough 23s. 6d., sack barrows 10s. 6d. and 18s. 6d., cheese press 2 gs., varnish stove 35s., poultry and game fences 9d. to 2s. 6d. per yard, treeguards 12s. to 21s. per dozen, standards for fence 6s. to 21s. per dozen.—Awarded silver medal for "Sketchley's" combined sawing, planing, moulding, and boring machine.

VICKARY, J., Exe Island, Devon.

Apparatus for small gas works 50l., recumbent gas bath 8l., meter 60s., gas cooking stove 4 to 6 gs.

WAIDE, W., Leeds.

Variety of churns, to make from 1 to 6lbs. 30s., to make 80lbs. 5l. 10s.

WALLIS, HASLAM, AND STEEVENS, Basingstoke, Hants.

Corn drill 95s., turnip drill £29 11s. 6d., one-wheel steerage 95s., horse-rake £8 8s. 6d., eight-horse portable engine £230, thrashing and dressing machine £115, straw elevator £53, spring hanger 72s. 6d., spherical bearings 11s. and 26s. 6d., thrashing machines £40 and £60 7s., barley aveller 95s., corn dresser 10 gs., corn screens £8 17s. and £9, sack holders 25s. and 27s. 6d., sack holder and sack truck combined 43s. 6d., fixed gear two-wheel plough, £5 2s. 6d., screw stamp ditto 96s. 6d., "Excelsior" harrows 70s. to £6 10s., horse-hoe 45s., vertical lever drill £7 5s., screw ditto £9 5s., set of chain harrows 67s. 6d.

WALTON AND CO., Worcester.

Indiarubber wringer 22s. 6d., Canadian washer 72s. 6d., wool and waste washer 10 gs., washer and mangle 8 gs., wringer and mangle 3 gs., clothes dryer 38s.; tent to hold 30 persons, closing like an umbrella, and weighing but 50 lbs., £5; road scraper £5 15s.

WARREN, J., Maldon.

Chaff-cutters 47s. 6d. to 11 gs., bean mills 3 and 6 gs., sets of harrows and whipple-trees 67s. 6d. and 80s., oilcake mills 3 gs., wood beam ploughs 52s. and 58s. 6d., other ploughs 2 gs. to £7 10s.

WATTS, R. J., Plymouth.

Elastic stitch cabinet and other sewing machines £9 to £18.

WEBB AND SON, Combs, Suffolk.

Assortment of leather machine bands, buckets, and hose, and of vulcanized indiarubber bands.—Commended for machine bands.

WEBBER AND CO., Newton Abbots, Devon.

Combined thrashing machine £38 and £105, reed comber 70s. and £5 10s., mortar mill £6.

WEIR, E., 142 High Holborn, London.

Spirit draining levels 30s. to 3 gs., workman's pendulum ditto 15s., chondrometer 35s. to 60s., pumps 5 to 8 gs., churns 25s. to 45s., milk test 1s., lactometer 6s., butter purifier 10s. 6d. to 52s. 6d., butter whisks 10s. 6d. to 24s., washing machines, mincing and sausage-making machines, with samples of small mills to grind coffee, pepper, spice, &c.

WESTERN COUNTIES MANURE COMPANY, Torpoint, Cornwall.

Superphosphate of lime, guano, animal charcoal, bone, ammoniacal, and turnip manures.

WEST AND CO., 4, Montague-mews North, London.

Reaping machine £20, combined reaper and mower £20 and £15.

WHEELER AND SON, Gloucester.

Collection of agricultural seeds.

WHIPPLE, E., Plymouth.

Chaffcutters 50s. to £8 10s., lawn mower £6, turnip cutter 90s., oat and bean crusher 95s., self-setting perpetual mousetrap 2s. 6d., rotary washing machines &c. 8 to 12 gs., and variety of miscellaneous articles.

WHITE AND CO., 29, Bedford-street, Strand, London.

Earth closets for mechanically applying Moule's system of deodorizing and utilizing excrementitious matter by means of dry earth, portable apparatus in deal case 30s. to £9 10s. with partition showing supply of earth from behind.—Highly commended.

WHITE, J., 7, Trinity-street, Southwark.

Oil-feeders 1s. 3d. to 3s. 6d., artificial dams 2s. 6d. to 3s. each; driving belts; clothes wringers 12s. 6d. and 15s., pendons 1s. to 3s. 6d., hand-drill 4 gs.

WHITEHEAD, J., Preston.

Drainpipe, tile, and brick-making machine £21, solid-brick maker £36, brick presser 16 gs.

WHITMEE AND CO., 70, John-street, Clerkenwell.

Bean mill £2 15s., oat crusher £2 15s., corn crushers £4 to £20, linseed crusher £4 15s., corn mills £6 to £41, flour dresser £15, flour mills £6 10s. and £20.

WILKINS, W. P., Ipswich.

Five-horse portable engine £170, grinding mills £20 and £25.

WILLIAMS, J. O., Torquay, Devon.

Cooking apparatus 30s. to £21, yacht caboose £2 to 16 gs., boiling pot 12s., recoil wind guard 15s., ship stove £5 10s.

WILLIAMSON BROTHERS, Kendal.

Four-horse portable steam engine £130, vortex turbine £135, centrifugal pumps £28 and £42, whirlpool blowing-fan £21.

WILLIARY, R., Preston.

Continuous trough for cowhouse £2 4s. per lineal yard, food apparatus £25.

WITHERINGTON, T., Foregate-street, Worcester.

Medicine chests, sheep powder, articles for toilet use, cattle medicines, and sheep-dipping composition.

WOOD, W. A., 77, Upper Thames-street, London.

Two-horse grass-mowers (three specimens) £22, one-horse reaper £18, self-raking side-delivery reaper £28, combined mower and reaper £25.—Awarded first prize of ten pounds for the two-horse grass-mowing machine, the second prize of seven pounds for combined mower and reaper, and first prize of nine pounds for one-horse reaping machine.

WOODS AND COCKSEGE, Stowmarket.

Corn mills £28 10s. to £75, "universal" mills £7 10s. to £15, crushing mills £5 10s. to £15, stable mill £5 15s., bean mill £3 15s., turnip cutters £4 10s. and £5 10s., root pulpers

£3 12s. 6d. to £5, oilcake breakers £2 12s. 6d. to £3 15s., poppy extirpator £8 15s., two-horse thrashing machine £37, one-horse carts 10 gs. to £15 10s., two-horse cart £16, horse powers £10 to 16 gs., two-horse mower £22, one-horse reaper £18, asphaltic apparatus £17, four-horse vertical steam engine £110.—Awarded second prize of three pounds for single-horse cart.

WORTH AND PONTFEX, 293, Oxford-street, London.

Knife cleaner 2 gs., barrel stand 8s., fork cleaner 2s., razor strop 3s., churns 18s. to 25s., milk pails 7s. 6d. and 12s. 6d., yoke 10s. 6d., bread-cutting machine, burglary preventor, boot and shoe cleaner, &c.

WRAY AND SON, Bedale.

Two-horse reaper £15, mower £19, one-horse reaper £15, combined reaper and mower £25.

WRIGHT, J., Sandford, Devon.

Drill for small seeds 50s., horsehoes 2 gs. and 45s., grubber 40s., self-delivery reaper £20, one-horse reaper £18, horse-rakes £7 and £7 10s., ploughs 75s. to £5 10s., sheep rack on wheels 65s., drags and whippetrees 15s.

WRIGHT, H., Boston.

Stacking machine £35, straw elevator £35.

WRIGHT, C. T. AND N. T., Boston.

Straw elevator £35.

THE IMPLEMENTS AT PLYMOUTH.

As far as the trials of reapers are concerned, little requires to be added to the account which appeared in our columns on July 17, and brought down the proceedings to the previous Saturday night. The judges were early in the field on the Monday, hoping to get through everything in time for a peep at the stock on Tuesday. The first business was to test the "selected" combined reapers and mowers upon the heavy oats, and then on the lighter rye. Wood's did its work well, the drop slat-platform being of great assistance in the delivery of the rye. There is no provision for delivering the sheaves at one side. If these trials are to be considered decisive, and sufficiently trustworthy to guide purchasers to the best machines, this is no doubt one of the best for the farmer's money, the judges having awarded it what may be called "the second" prize of £7. Hornsby's combined machine took the chief prize of £8, and certainly showed great capabilities in both the light and heavy crop; the main point about it is that, as in some other machines not so well constructed as this, two men have seats provided for them, one driving the horses, and the other having only to attend to the delivery of the sheaves with his rake. Bamlett's two-horse combined reaper and mower did not work to equal advantage, but did its cutting extremely well, and came in for a prize of £5. Kearsley's two-horse combined machine made a decidedly inferior performance in comparison with the former machines, but still was considered sufficiently meritorious to deserve a high commendation; and a commendation was awarded to Barber's combined machine, in which the sheaves are pushed off at the side. This machine would bear considerable improvement in make and finish of its parts. On the whole, we are not very favourably impressed with this class of machines; they may answer for a grass district where a small proportion of corn is grown; but, at present, the public will exercise a discretion by purchasing strong grass-mowers for heavy hay, and strong reapers for good grain crops, a system that will pay far better both in quantity and quality of work done, and more especially in the item of repairs, than attempting to get too much out of one implement.

The selected manual-delivery machines were tried again, and then several were tested by the dynamometer, lightness of draught being in favour of Wood and Samuelson,

In the class of one-horse reapers Wood's machine, with back-delivery slat-platform, very deservedly took the first prize of £9, as this is an implement thoroughly "proved" on the farm. The second prize of £7 went to Samuelson's "Eclipse" reaper, with tipping zinc-covered platform for back delivery, and no intermediate driving-shaft, the very simplest of all in respect to moving parts. Hornsby's machine came in for the third prize of £5; the cutting was excellent, and the drop-platform for back delivery is made of slats, with their under-edges bevelled, so as to collect more projecting stubbles in the slits for catching and delivering the sheaf upon the ground. The dividing iron is specially adapted for keeping the standing corn off the cut sheaf. Cuthbert's machine received only a "high commendation," though its work was universally acknowledged to be very good. The judges seem to have laid down the principle that their awards must be to the machines, and not to the men working them; and they thus made up their minds that Cuthbert is the cleverest rake-man in England; so that by consequence, his unequalled performance was due mainly to his personal skill and address, and but little to his machine. The main merits of this consist in the strength of its construction just in those parts that long field-practice has gradually improved. The platform, for either back or side delivery, is simply a flat board, with the addition of a small friction-roller at the back; and in light crops perhaps a tipping platform would be decidedly better; but for delivering very heavy crops, nothing can surpass the plain immovable board. Page, Picklesley and Sims, Dicker, Bowhay, and Bamlett did work calling for no special remark. In the class of two-horse manual delivery reapers, the first prize of £10 was won by Hornsby and Sons' new machine, in which the man picks up and divides with his rake, and drops a slat platform with the sheaf upon a lower platform having endless chains that deliver the sheaf at the side. We need not say more than we have already done concerning this novel and most valuable invention, except that this decision of the judges is fully consistent both with the actual performance of the machine, more particularly upon the rye, and the great facilities which it promises in the harvesting of crops in very varied conditions. Hornsby's grated drop-platform reaper, with back delivery only, takes the second prize of £5; and an equal prize is

awarded to Picketsley and Sims' "Champion" reaper, with shafts, large main-wheel, pendulum sling for the connecting-rod end of the knife-bar, and the back half of the platform made to drop, but balanced by a weighted lever. Among the novel ideas in this class was noticeable Brenton's roller-delivery. The cut corn falls upon a transverse roller of about eight inches diameter, made of wood, with numerous small iron staples, forming so many short pegs, upon its surface. This roller is ordinarily at rest; but when a sheaf has to be delivered the man's foot depresses a treadle, and the other end of the lever raises one end of the roller, which carries a small plain wood rigger: this rigger being thus pressed against a corresponding plain wheel on the axis of the main driving-wheel, causes the roller to rotate and carry over the sheaf, which it delivers behind. The trial upon moist corn did not succeed, the operation being better performed, however, on the Monday. Another machine of this maker, but not brought out, we believe, to the trial field, has a quadrant-shaped platform with a conical roller, intended to act as a side delivery.

The £10 for self-side-delivering machines is divided into two sums of £25 and £15 each, the former going to Hornsby and Sons, and the latter to Samuelson. The concluding competition in this class was between Wood's, Samuelson's, and Burgess and Key's side sheaf-delivery reapers, and Hornsby's swathe-delivery machine, the Beverley Company's swathe-delivering machine having been withdrawn. Hornsby's swathe-delivery first prize reaper did not manage the heavy oats at all well, but the rye was laid beautifully, the cut in both cases being first-rate. The machine is somewhat like Lord Kimbaird's improvement of Bell, the corn falling, however, on a fixed inclined platform with horizontal endless chains passing across it, instead of upon a cloth web, as in the Scotch machine. If the dividing iron is right, and there is a sufficiently wide "throat" for a heavy strawed crop to come off the chains, this is a very good machine. We are of opinion, however, that had the Beverley Company displayed a little more address in their manipulation, for it does want a man with a head-piece to hold the steering-pole, their lately improved machine, would have made a better figure at Plymouth, and have shown the full advantages derivable from a first-class swathing reaper. Burgess and Key's sheaf-delivery machine cut well, but delivered badly-formed sheaves: the action of the rake appearing too sudden, and the motion

not sufficiently smooth and quiet, at least for very heavy crops. Wood's self-raking-off reaper began in good style; but the rake arm on the vertical spindle, which drives the reel, of five flyers, is somewhat weakly designed, although it enters the crop at the side, and sweeps the platform in the right direction, and therefore is good in idea. Samuelson's machine, with automatic rakes to reel-boards, revolving windmill-fashion, but in a generally horizontal direction, did its work in a more creditable manner: the slow motion of the rakes enabling them to deliver the sheaf-bunches in a tolerably neat style, though not so well as they are laid by a manual-delivery machine. Two of the Banbury reapers were tried; the prize going to the lately improved and cheaper of the two—the price £30. The axis of the rakes is slightly inclined from the upright, leaning a little towards the platform, the tilt of the rake-arms in their rotation being regulated by an irregularly-shaped circular cam; and instead of being driven by an endless chain, as in the old machine, they receive motion by means of a shaft with bevel wheel and pinion directly from the intermediate shaft which drives the crank. There is a quadrant bracket for setting the machine at any requisite height from the ground without disarranging the gear of the main spur-wheel and pinion on the intermediate shaft.

A question has been mooted whether or not the Society should in future prescribe what it means by a "one-horse," and what by a "two-horse" machine. Most of the machines exhibited under the former category are capable of taking about as wide a cut as those under the latter denomination; the drivers simply taking a portion of their breadth where the crop is heavy. Some critics observed that the useless knives were taking up motive power to drive them; others said that these spare knives are wanted for catching odd straws that lean over away from the crop. A suggestion has been made that the Society should limit one-horse machines to a finger-bar of say four feet in length; but this hardly serves a practical notion, for if any maker can bring out a machine that will cut a breadth of six feet, and yet be of moderate draught for one horse, why shouldn't he?

The dynamometer draughts of the selected grass-mowers and reapers will appear in due course in the Royal Agricultural Society of England's *Journal*; but we here give in a tabular form certain points as furnished us by some of the makers.

PARTICULARS OF GRASS MOWERS AT PLYMOUTH.

	Picketsley and Sims 2-Horse Mower.	Hornsby and Sons Mower.	Wood's Mower.	Burgess and Key's New Mower.	Samuelson & Co.'s Mowers.
Number of revolutions of crank for each lineal yard advanced by the machine	10	12	11	11	10½
Length of stroke of the knife-bar	3 inches.	2½ inches.	2½ inches.	2½ inches.	3 inches.
Breadth of a knife along the bar	3 inches.	3 inches.	3 inches.	3 inches.	3 inches.
Length of a knife from the bar to the point	2¼ inches.	3-16th inches.	1¾ inches.	1½ inches.	2⅛ inches.
Distance apart of the fingers, centre to centre	3 inches.	3 inches.	3 inches.	3 inches.	3 inches.
Knives plain or serrated	plain.	plain.	plain.	plain.	plain.
Width of cut	½ feet.	½ feet.	4 feet 3 inches.	4 feet 3 inches.	4 feet.
Total breadth of machine, out to out	9 feet 1 inch with bar down, 4 feet 7 inches with bar raised.	9 feet at work, 4½ feet turned up.	7 feet 10 inches at work, 4 ft. travel.	8 feet when cutting, 4½ feet when travelling.	Has a folding beam for travelling.
Weight of machine	about 8 cwt.	7 cwts.	5½ cwts.	6 cwts.	5 cwts.
Shafts or pole	pole.	pole.	pole.	pole.	pole.
Price	£22	£22	£20, with extras £22.	£20 delivered to any railway station in England.	£20.

PARTICULARS OF MANUAL REAPING MACHINES AT PLYMOUTH.

	Picksley and Sins' 2-Horse Reaper.	Hornsby and Sons' New 2-Horse Reaper.	Hornsby and Sons' New 1-Horse Reaper.	Hornsby and Sons' 1-Horse Reaper.	Wood's 1-Horse Reaper.	Samuelson and Co.'s 1-Horse Reaper.	Cuthbert and Co.'s 1 or 2-Horse Reaper.
Number of revolutions of crank for each lineal yard advanced by the machine ...	7½	8	8	8	7½	4½	6½
Length of stroke of the knife-bar ...	3 inches	3 inches	3 inches	3 inches	3 inches	6 inches	3½ inches
Breadth of a knife along the bar ...	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Length of a knife from the bar to the point	2¾ inches	2¾ inches	2¾ inches	2¾ inches	1¾ inches	2¾ inches	3½ inches
Distance apart of the fingers, centre to centre ...	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Knives plain or serrated ...	plain	plain	plain	plain	plain	plain	plain
Width of cut ...	5 feet 8½ inches	5 feet	4½ feet	5 feet	4 feet 8 inches	5 feet	5 feet
Total breadth of machine out to out ...	9 feet 3 inches	8 feet	7 feet	8 feet	8 feet 4 inches	7 feet 6 inches	7 feet 10 inches
Weight of machine...	9 cwt.	8¼ cwt.	6½ cwt.	5 cwt.	4¾ cwt.	5½ cwt.	9 cwt.
Shafts or pole ...	pole or shafts to order	pole	shafts	shafts	shafts	shafts	shafts
With or without reel	no reel	no reel	no reel	no reel	no reel	no reel	no reel
Mode of delivery.....	Balanced tipping platform	Tipping slat platform and endless-chains on a lower fixed platform	Tipping slat platform and endless-chains on a lower fixed platform	Patent grated drop platform	Drop skeleton platform	Tipping platform	Fixed flat platform with friction roller behind
Side or back delivery	Sheaves at the back	Sheaves at the side	Sheaves at the side	Sheaves at the back	Sheaves at the back	Sheaves at the back	Sheaves at the back or side
Price	With shafts £21, with pole £22 10s	£23	£19 10s.	£16 16s.	£16 10s., with extras £18	£16 16s.	£22, or £24

PARTICULARS OF SELF-DELIVERY REAPING MACHINES AT PLYMOUTH.

	Hornsby & Son's 2-Horse Reaper.	Wood's 2-Horse Reaper.	Burgess & Key's New Machine.	Samuelson and Co.'s ditto.	Beverley Iron & Waggon Company's New 2-Horse Machine	Beverley Company's 3-Horse Machine.
Number of revolutions of crank for each lineal yard advanced by the machine ...	8	6	7	4½	5½	5½
Length of stroke of the knife-bar ...	3 inches	3 inches	2¾ inches	6 inches	3 inches	3 inches
Breadth of a knife along the bar ...	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Length of a knife from the bar to the point	2¾ inches	1¾ inches	2¼ inches	2¾ inches	2¾ inches	2¾ inches
Distance apart of the fingers, centre to centre ...	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Knives plain or serrated ...	plain	plain	plain	plain	serrated	serrated
Width of cut ...	5 feet	5 feet 3 inches	5 feet	5 feet	5 feet 9 inches	8 feet 3 inches
Total breadth of machine out to out ...	8 feet	9 feet 4 inches	7 feet 6 inches	7 feet 9 inches	6 feet 9 inches	9 feet
Weight of machine...	10¼ cwt.	7½ cwt.	11 cwt.	10 cwt.	13 cwt.	15½ cwt.
Shafts or pole ...	pole	pole	pole	pole	pole	shafts
With or without reel	reel	reel	reel	no reel	reel	reel
Mode of delivery.....	Endless chains passing across a fixed sloping platform	Rotary rake, hinged upon a vertical spindle	Rotating rake upon the reel, with sweeping movement across the platform.	Revolving rakes	Endless belts, passing across a fixed sloping platform	Endless belts, passing across a fixed sloping platform
Side, back, sheaf, or swathe delivery	Swathe, at one side	Sheaves at side, the number per minute delayed at pleasure	Sheaves at the side	Sheaves, or swathe, at the side	Swathe, at either side as required	Swathe, at either side as required
Price	£34.	£26 10s., with extras £28.	£34.	£30.	£37, with two complete knife-bars and six extra cutters, etc.	£42, with two complete knife-bars and six extra cutters, etc.

Amongst the haymaking machines and horse-rakes it is noteworthy that Messrs. J. & F. Howard cleared off all the prizes they "went in" for: that is, out of the £15 offered for haymakers, they took £6 for one machine and £5 for another; and out of the £10 offered for horse-rakes, they won £6 for the new rake sent out by the Britannia Works. The first-prize Bedford haymaker has really all the improvements of the Leeds prize machine—including the eccentric motion for instantly reversing the action, without having to make adjustments at both ends of the machine; it works most effectively, both as a tedder and turner, and without the possibility of clogging; yet the selling price is only eleven guineas. The second-prize larger-sized machine is the old one with several improvements—as a solid steel spindle in place of the tubular axle; the reversing of the action is accomplished at one movement, without touching the rakes; and the springs are inserted in slots without being weakened by holes through them.

The Bedford horse-rake has been much improved by giving the teeth a larger sweep, and a larger leverage for rising over obstacles when in work; and to secure greater lightness for lifting while preserving the same strength as before, the steel teeth are rolled tapering, that is, slightly decreasing in thickness all the way from the hinge end to the point, where the tooth is only half an inch thick. The raising is effected by sinking the hinge bar, the main axle forming the fulcrum; and the curve of the back and lower part of the teeth is concentric with this axle as a centre, so that the teeth have no tendency to lift up the hay when rising. An easy bell-crank lever arrangement enables the teeth to be easily lifted by the hand, and to keep up when lifted, without any catch or hook. Messrs. Howard have brought out the best arrangement we have seen of a seat upon a horse-rake, with hand levers for ready-lifting of the teeth. This is well adapted for hot countries, but will scarcely be much patronized by farmers at home.

Booby's third-prize haymaker is an admirably-made tool, extremely simple in the working parts, and upon wheels of well-seasoned wood. Mr. Nicholson's haymaker receives a high commendation. This machine, excepting improvements in a few details, won the first prize at the Salisbury meeting, is peculiarly efficient, with extremely simple gear for driving both the forward and the back action, and defies any crop to clog it or wrap upon the barrels. Mr. Nicholson has a number of clever diagrams, showing the cycloidal track of the teeth and the frequency of the points of contact with the ground (or the crop) in the case of his own and other first-class machines, from which, according to theory, the Newark machine ought to beat all others hollow. It did not appear, however, during the trials accorded to the several machines, that this did more tossing and separating of the grass or that it turned the tedded hay more efficiently than others. The late improvements consist of a small eccentric for altering the pitch of the shafts; a better form of fork-barrel, with a hollow fitting the axle-ends, to preclude the possibility of any wrapping and clogging. Mr. Nicholson has brought out a ten-guinea horse-rake having the back-action only. This new machine has an adjustable seat for the driver. A. and T. Fry receive a commendation for Grace's new haymaker, with disc or solid wheels, and the axis so placed as to relieve the horse's back of pressure, the man partly balancing by riding; the cage, however, is in one revolving piece—giving far less advantage than with a division. Ashby and Jeffery have still farther improved their original haymaker, which has, in its day, won so many prizes. Without any complication, the forks are so contrived that their velocity may be increased or diminished at the pleasure of the operator—a valuable facility for suiting all sorts and conditions of grass.

The springs also have considerably greater power than in previous machines. This firm also makes a fourteen-guinea haymaker, with zig-zag arrangement of forks and reversing motion; and their eleven-guinea machine, of six inches' less breadth, works both ways, but with the forks in a single revolving cage. Among other hay machines that struck our notice were Huxtable's light skeleton machine, with crank axle for setting at different heights, but with only one-way action; as also Cranston's "kicking" hay-tedder, the great merit of which is its lightness of draught, and its action being under complete control of the driver on his seat, without stopping "the pony;" for it has the recommendation of not requiring so much as a horse to work it.

The second prize for horse-rakes was awarded to Page and Co. of Bedford, their implement being well-constructed, simple and effectual in principle, and with oval steel teeth. The breadth taken at one time is 7 feet 9 inches, and the price low.

THE IMPLEMENT YARD.

Notwithstanding previous announcements in hopeful newspapers, nobody expected to find a heavy show of mechanism down at the sea-coast of Devonshire. The figures tell us that while Leeds had 5,488, Battersea 5,064, and Worcester 5,839 implements, Newcastle last year had 4,024, and Plymouth just one less. All the great makers were represented in the sheds. Bentall had a fine show of chaff-cutters, mills, and pulpers. Coleman and Morton exhibited their steam-cultivating apparatus, prize cultivators, and rotary potato-digger. The Reading Iron-works Company showed their fixed steam-engine, chaff-cutters, thrashing-machines. Tasker and Sons showed drills, and Seaman's trussed-beam harrows. Blackburn's traction-engine was a singular feature in the machinery-in-motion department; the boiler upon small wheels running on a sort of endless tramway inside a large drum, while the steam cylinders and gear-work are upon an external frame. A large diameter and great bearing-surface are attained by this manner of construction; but modern practice points to economizing weight, and keeping the steam hot, as two sources of success in designing "tractor" engines. Carson and Toone showed prize horse-hoes, and single-row grubbers, unequalled for strength and efficiency. The Beverley Iron and Wagon Company came out with their usual strength in machine-made carts and waggons for all purposes, prize one-horse carts with "tips," harvest-carts, and sets of patent wheels. Woods and Cocksedge showed mills, weed extirpators, and the horse-powers for which they are famous. Eaton and Sons exhibited horse-hoes, and their prize revolving turnip-thinner. J. and F. Howard had a fine stand of haymakers, ploughs, their certainly unequalled ridging and potato ploughs, ploughs with the new "digging breasts," flexible chain-harrows, and their apparatus for steam cultivation. The new traction-engine, having the boiler placed transversely upon a three-wheeled frame, displayed its facilities of turning, and ascending and descending inclines. These engines are specially applicable for contract companies, to work on the double-engine system, hauling the implement to and fro by a single line of rope. For ordinary farm-use, the stationary windlass, with two winding drums, was exhibited. Ransomes and Sims had a great display of Newcastle prize ploughs, corn screens, mills, their steam engines and thrashing machines. One novelty here was the semicircular whippetree, invented by Mr. Edmunds, of Rugby: the foot-chain is attached by a friction-roller, which, running at liberty within the semicircular back of the whippetree, changes its place according to the position of the whippetree, thus

always preserving an equal strain upon each horse; and the judges honoured this invention with a silver medal. On the next stand was Phillips' "rotary spader," invented by "Cicero Comstock," of America. A very ingenious combination of mechanical motions is employed to direct a number of tines properly into the ground, and again to adjust their position on emerging with the broken earth. Drawn by four horses, this barrel of spikes proposes to dig eight inches deep and three feet wide; but it was not taken out, we believe, to the trial-field. The construction is of nothing like so strong a character as that of Samuelson's rotary forker. Reeves had a large show of drills, water-drills and manure distributors. Clay showed his cultivators and weed eradicators, with a wonderfully simple and good ridge horse-hoe, which can be set to different widths without stopping the horse for the purpose. Ireland's three-motion churn is a clever thing, accomplishing a great deal of dashing with very few moving parts. Page and Co. had a good stand of horse-rakes, chaff-cutters, and ploughs. Whitehead exhibited his drain-pipe, brick, and tile machines. Amies, Barford, and Co. had an extensive entry of water-ballasting rollers, water-ballasting adjustable grange rollers—the framing of the lightest kind, and the friction and wear on the bearings reduced to a minimum; also the farmer's steam cooking-apparatus, and the Felton American corn-grinding mill. Mellard's new cheese-making apparatus, invented by Mr. Pugh, of Uttoxeter, deservedly came in for a silver medal. We had supposed that nothing could surpass Kccvil's invention; but here we have numerous points of improvement in cutting, gathering, pressing, and vatting curds, altogether by far the cleverest, most hardy, and valuable contrivances we have yet seen for a great cheese dairy. Sharman shows the use of galvanized and tubular iron in hand rakes, corn bins, and vessels. Ball exhibited ploughs and carts. Childs sent the California lifting and force pump, a neat contrivance, with ample provision for the passage of solid bodies through the valves. Mapplebeck and Lowe had a large assortment of chaff-cutters of their own manufacture, a great variety of agricultural articles, and an interesting collection of models. Priest and Woolnough showed their drills and horse-hoes. Skelton's turnwrest plough, well named "The Butter-fly", is a remarkably ingenious tool: one mouldboard is advanced and the other retired, the share turned over, the sideway adjustment given to the coulters, and the land and furrow wheels set at liberty and re-fixed in the new position, all by a single movement of the ploughman's hand. Another turn of a handle puts the skim-coulter from right to left-hand action. Tinkler exhibited churns of all sizes. Wallis, Haslam, and Co., showed steam thrashing-machines, dressing-machines, and sack-holders. Garrett and Son showed portable steam-engines and thrashing-machines, with a great novelty in the form of a machine for reducing straw to a soft mass, for rendering it more easily digestible—probably this may introduce a more profitable economy of straw food into English agriculture. The machine requires to be driven by an S-horse engine; but it is very likely that a more rapid rate of performance will be attained by gradual improvements in the friction-drum and coneave, by which the straw is torn into small shreds. Peirce showed a capital assortment of japanned wrought-iron troughs, the best possible for all sorts of stock to feed out of. Richmond and Chandler had a large number of chaff-cutters. Bradford contributed a great show of washing machines. Plimsd Brothers had the largest stand in the yard, comprising a vast variety of agricultural and horticultural implements and tools. Boby showed his well-known corn-screens, and haymakers. Picksley and Sinus exhibited among numerous other articles

a new chaff-cutter, which cuts two different lengths of chaff without changing the wheels, and also a really good gorse-cutting and bruising machine for preparing this valuable and cheap produce for horse and cattle food. On Brinsmead's stand was a "synchronical thrashing and reed-making machine," that is, a machine for stripping out grain from the ears, while leaving the straw unbroken for thatch; also a child's self-exercising nursery chair, a chair mounted upon a wood spring, giving it a dancing motion. John Fowler and Co. exhibited their steam-ploughing and cultivating machinery, and a 10-horse traction-engine, admirably designed, very powerful, with the bearings all covered from dirt, and easily oiled while the engine is in motion. Hornsby and Sons had a large stand of drills, ploughs, pulpers, and washing-machines. Burgess and Key exhibited reapers and mowers, pumps, American churns, and a number of domestic articles. On Holmes' stand was Mr. Everett's new rotary harrow or twitch-extirpator, a sort of adaptation of the haymaker cage to the work of forking: in the trial-field we believe this tossed the soil about well, and received from the judges a silver medal. The price is exceedingly low. Willary's method of supplying a continuous cattle trough with cake and turnips, falling broken or cut from a travelling machine, is very ingenious; but we think scarcely a practical motion, at least in its present form: in exceedingly large feeding establishments it might answer. Allen's twelve-horse expansive portable engine excited considerable attention, owing to the simplicity of the means by which it economizes a vast proportion of coal and water. Tuxford and Sons had a fine show of their prize portable engines of various powers, from twelve-horse down to a one-horse engine—just the thing now wanted for various light processes of the barn and feeding-house. Wright showed a novel straw-carrier, which feeds itself with straw and conveys it to any distance and height, in any direction—requiring, however, much previous fixing and after-removal, when only a single day's thrashing is concerned. Clayton, Shuttleworth, and Co. exhibited portable-engines and thrashing-machines. Robey showed portable steam-engines. Brown and May showed steam-engines and pumps. Ruston, Procton, and Co. had portable engines, thrashing-machines, and saw-benches. Barrows and Carnichael exhibited a thrashing-machine with a spring table-shaker, and vibrating-board driven by a single crank-shaft. Webber and Co. had a thrashing-machine without a vibrating-board, the corn being conveyed along a fixed board by means of scrapers under the shaker-boxes. Maynard showed his sifting chaff-engine, with four knives—the most powerful chaff-cutter in use. Riches and Watts sent the American grist mill. Aveling and Porter had a couple of traction engines, with the disc wheel ready steerage, and light pitch-chain driving gear. These engines travelled upon common roads all the way from Rochester in Kent, accomplishing the long journey in six days.

The department of seeds and models comprised Neighbour's popular beehives; the display of seeds, roots, cereal specimens and samples, of Thomas Gibbs and Co.; a fine stall of seeds and roots of Sutton and Sons; another show of seeds by James Carter and Co.; Harvey's powder for killing wire-worms; and Raybird's samples of cereals.

MONTHLY COUNCIL.—*Wednesday, August 2, 1865*; present, Lord Tredegar, President, in the chair, Lord Chesham, Major-Gen. the Hon. A. N. Hood, Mr. Arkwright, Mr. Raymond Barker, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Braudreth Gibbs, Mr. Holland, M.P., Mr. Raudell, Mr. Sanday, Mr. Shuttleworth,

Mr. Thompson, Mr. Torr, Mr. Wells, Mr. Frere, and Professor Simonds.

FINANCES.—Major-Gen. the Hon. A. N. Hood, chairman of the committee, presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on July 31 was £7,497 16s. The Committee recommended that the money now on deposit (£1,000) be withdrawn to meet the Plymouth expenses. This report was adopted.

JOURNAL COMMITTEE.—Mr. Thompson reported that in Class II. the only Essay sent in was not considered deserving of the prize.

In Class V. the prize of £25 is awarded to the Essay bearing the motto "Summ Cuique," written by Wm. Henry Heywood, Dunham Massey, Altrincham, Cheshire. The Essay 564, by W. T. Carrington, Hallington, Uttoxeter, is commended.

In Class VII. the prize of £20 is awarded to the Essay bearing the motto "Rufus," written by A. Bailey Deuton, Stevenage. The Essays 566, by John Ewart, Bigg Market, Newcastle-on-Tyne, and 568, by Philip D. Tuckett, 76, Old Broad-street, are commended.

In Class IX. the prize of £10 is awarded to the Essay bearing the motto "Anteveni, et subolun," &c., written by William Little, Bunker Hill, Lambton Fence Houses; and No. 579, written by G. Murray, Overstone, Northampton, is commended.

The following list of subjects was recommended for Prize Essays for 1866:—

	£
1. County Essay, Worcestershire	50
2. ditto Leicestershire	50
3. Town Dairies, especially with reference to the Prevalence of Disease	25
4. Mountain Herds of Sheep: pure or crosses	20
5. Leaves of Plants; power of resisting drought	20
6. Improvements of Waste Lands in connection with Mines	15
7. On the use to a Farmer of Magnifying Glass or simple Microscope	15
8. Any other Agricultural subject	10

Recommended that the Shorthorn, Hereford, and Devon Herd-books to the present time be purchased for the Library.

This report was adopted.

VETERINARY.—The following are extracts from the report of the Governors of the Royal Veterinary College for the year ending 31st December, 1864:—

During this period all the means at the command of the College were kept in full operation, the lectures, demonstrations, chemical instructions, &c., being daily delivered so soon as the scholastic session commenced, viz., in the month of October, according to established custom.

The chief subjects treated of in the lectures on Cattle Pathology, after the necessary introductory ones, were the physical and vital properties of the blood, with the pathological changes it undergoes in inflammation and other morbid conditions of the body.

This section of the instructions included likewise a full description of the causes, symptoms, and treatment—prophylactic and curative—of the diseases commonly known as Redwater in cattle and sheep, Blackleg, or Quarter Garget, Splenic Apoplexy, Diabetes, Purpura, &c., together with the results of inflammation, such as effusion, suppuration, adhesion, ulceration, and mortification.

The number of pupils in attendance was larger than ordinary, no less than fifty-eight "freshmen" entering between October and the commencement of the Christmas vacation.

The yearly increasing entries of pupils, with the extended instructions and more rigid examination, bids fair to elevate the profession, and to keep the country well supplied with scientific

veterinary surgeons on whom the agriculturists can confidently rely at the time of need.

The Bovine animals admitted into the infirmary have afforded useful instruction of a practical nature, although the cases of disease have not been of any uncommon kind. One case, however, of disease of the eyeball, requiring the performance of a bold but delicate operation, very rarely had recourse to in the lower animals, was successfully undertaken, the result proving most satisfactory. Another complex case of disease of the womb, associated with an accumulation of purulent matter within the organ, also required a surgical operation, the performance of which was attended with the happiest result. These two cases are only alluded to for the purpose of showing that operations requiring an accurate knowledge of anatomy are among many others brought before the notice of the pupils, on which occasions every step of the process is fully explained to them.

The number of morbid specimens received from country veterinary surgeons and others has been fully equal to any former period of the like duration; and these also, according to the established custom, have been used for the benefit of the class. Many of them have possessed novel features; and, as such, a selection has been made for publishing in the *Veterinarian* the particulars of the cases in which they occurred.

The governors are fully alive to the necessity which exists for the strict investigation of every new or modified form of disease which may show itself among the animals of the farm; and they only require the cordial co-operation of the members of the Society to enable them to accomplish this desirable object, and apply the knowledge obtained to the practical advantage of the agriculturists themselves.

Many members of the Society continue to consult the professor of cattle pathology in cases of serious outbreaks of disease; and the governors have learnt with much satisfaction that his visits into the country during the past half-year, for the purpose of studying the causes, with a view of arresting the progress of disease, as well as the instructions given for the treatment of infected animals, have, as a rule, been followed by beneficial results.

In the report for last year, mention was made of a series of experiments being instituted in order to elucidate much of the mystery which still surrounds the existence of parasites within the animal body. This intricate and important inquiry is still going on; and several of the facts arrived at have already been used with advantage, both in freeing animals from parasites and in warding-off their attacks.

The following letter from Professor Simonds was read, and directed to be published:—

Royal Veterinary College, Aug. 1, 1865.

"To the Council of the Royal Agricultural Society.—I have to report that the disease which has recently made its appearance among cattle continues to extend its ravages, and that, since my last report, several more of the London dairies have become the seat of the malady.

"Besides this, the disease has also shown itself in different parts of the country, as, for example, in Shropshire, Suffolk, Norfolk, and Sussex. In each of these instances, although the places are far removed from each other, the cause of the outbreak can be clearly traced to the introduction of animals in whose systems the disease was incubated. The facts I am in possession of give no support to the opinion that the malady has had a spontaneous origin in this country, but that it has been introduced from abroad, by the importation of foreign cattle.

"I have also to report that I am in daily communication with the Government, who have adopted a system of inspection of the diseased cattle within the boundary of the metropolitan police, to keep in check the progress of the malady, and who, I have reason to believe, will transmit without delay some suggestions for the consideration of the council, having the same object in view.

"JAMES B. SIMONDS."

The committee recommended the usual grant of £200 to the Royal Veterinary College for the year 1865. This report was adopted.

It was moved by Mr. Hollaud, M.P., and seconded by Major-general the Hon. A. N. Hood, that the Veterinary Committee may meet (if summoned by the chairman) from time to time between this meeting and the Novem-

ber council, and that the committee be empowered to take such steps as they may consider necessary in reference to the cattle plague and small-pox among sheep.

MEETING AT BURY, IN 1866.—It was arranged that the following members of the Bury committee should proceed at once to Bury St. Edmunds, and make arrangements, viz., Lord Tredegar, Sir Edward Kerrison, Mr. Braudreth Gibbs, Mr. Randell, and Mr. Sanday.

SHOW-YARD CONTRACT.—Mr. Randell presented the following report:—

Your Committee have to report, that acting upon the recommendation of the surveyor at Plymouth, they agreed to purchase from Mr. Manning such offices and other articles as were well adapted to their several purposes, a list of which, with prices annexed, is appended to the Surveyor's report. It will be seen that certain offices are purchased for £457, the annual charge for the use of which has been (including cost of transit and fixing), £372; other things are purchased at a cost of £177 2s., making the total £634 2s.

The charges for the use of the latter cannot be accurately stated, they having formed part of other charges; but as the annual cost of such of the offices as have been separately charged for has been 8J per cent. of value, it may be inferred that the Council have paid liberally for the use of the remainder. Carrying out the principle that the permanent offices should belong to the Society, the contract for next year should provide that the entrances (which we hope to see an improvement upon the old ones), the office for Council and Secretary, with any other building of the sort which may be found necessary, shall be retained, thus leaving for future years only the temporary erections to be contracted for.

As an inventory of the Society's plant was to be had at Plymouth, your Committee requested Mr. Manning to have the whole, with that now purchased from him, carefully packed and removed to Bury St. Edmunds, furnishing the Council with an inventory of everything, which he promised to do. The Surveyor will attend to its disposal at Bury.

The Surveyor reports upon Mr. Manning's bill for work at Plymouth, that the portion to which the schedule of prices agreed upon in 1862 applies amounts to £2,976 1s. 4d., the value being £2,693 19s. 7d., excess £282 1s. 9d.; other works not provided for by any agreement as to prices, £502 5s. 8d., the value £380 10s. 8d., excess £121 13s.; supplemental bill, £59 5s. 6d., the value £43 5s. 6d., excess £16; total amount in excess of the value of work, including certain extra charges which should form part of measured work at stated prices, £419 14s. 9d.

Seeing, however, that the prices for the greater part of the work have been previously agreed upon, that for much of the remainder Mr. Manning has precedent to show, and for all, the Council by the Secretary, have agreed to pay, it only remains to do so, and to hope that the new system may prove as advantageous in practice as it is sound in principle. To carry out this principle no time should be lost, and we recommend that the Surveyor be instructed to prepare plans and detailed specifications for the Show-yard works at Bury St. Edmunds, and that the Show-yard Contract Committee be empowered to settle such plans and specifications, and to obtain by advertisement tenders thereupon, to be opened at the Council Meeting in November.

This report was adopted.

The following letter was received from the Privy Council:

"Privy Council Office, Whitehall, Aug. 2, 1865.

"My Lord,—I am directed by the Lord President of the Council to transmit to your lordship the accompanying copy of an Order which has been issued by a committee of the Lords of the Council, and to request that you will have the goodness to lay it before the Royal Agricultural Society.

"Your lordship is probably aware that there has lately appeared in some of the dairies in and near London a disease amongst the cattle, closely analogous to, if not the same as, that which has of late years prevailed extensively in Russia, Austria, and the eastern parts of Europe, called the cattle-plague, being a species of typhoid fever. The loss of animals caused by it in those countries has been very serious. Returns have been furnished to this office by which it appears that in 1864, 159,476 cattle were attacked by this disease in Russia,

out of which 104,714 died. The powers vested by law in the Government, with respect to the diseases of cattle, are very limited; and, moreover, it does not appear that in countries where the Governments possess the amplest powers for dealing with cases of this kind, and where they have exercised those powers with great vigour, any signal success has attended their measures. The Lord President therefore thinks that it is upon the care and circumspection of individuals interested in the cattle trade that the chief dependence must be placed for precautions to be taken which may prevent the spreading of this formidable disease. It is of the first importance that all farmers, cowkeepers, or dealers in cattle, when purchasing new stock, should, for several days, not less than 12 or 14, keep their cattle apart from the rest of their stock, until in fact there is reason to think that the new purchases are free from this disease.

"If a farmer, cowkeeper, or salesman should be desirous to get rid of any animals suffering from the disease in question, or even any which may have been in close contact with animals suffering from that disease, it should be impressed upon him, as a public duty, that, at the present juncture, he should not send them to markets, or other places, where they would be brought into contact with other animals; but should cause them to be slaughtered at once; and thus do what he can to prevent the spreading of the disease.

"Particular attention should be paid to the cleansing of all yards, sheds, and other places where cattle are kept; and this cleansing should be especially insisted upon where there has been any manifestation of this disease. These places should be disinfected by the free use of chloride of lime or other allied compounds. It is also of great importance that all diseased animals should be as quickly as possible removed to as great a distance from the healthy as circumstances will allow; and all indirect as well direct communication be strictly prevented between them. The animals which are the most severely affected having at once been killed and buried, their skins may be preserved to the owner by being placed in a disinfecting fluid as soon as removed from the body.

"That it is advisable to kill the diseased animals at once is best shown by the circumstance that it rarely happens that where the disease is allowed to run its natural course, deaths are at a lower rate than 8J per cent., and also by the fact that every diseased animal is a continuous source of danger by disseminating the elements of the infection.

"I subjoin an account of the symptoms, which, according to Professor Simonds, of the Royal Veterinary College, who has paid particular attention, both in this country and in Galicia, to the disease in question, are the usual characteristics of the malady.

"Professor Simonds states that, with the present amount of experience, no special plan of medical treatment can be laid down; but that it would appear that the disease is best combated by a free use of stimulants, conjoined with antiseptic agents, the strength of the animal being kept up by a liberal supply of wheat, or oatmeal gruel, boiled linseed, and similar dietetic agents.—I have the honour to be, my Lord,

"Your Lordship's obedient servant,

"The Lord Tredegar," &c. "ARTHUR HELPS."

Description of the symptoms of the disease before referred to:—

"Variations in the earliest indications of the disease will be manifested, these depending somewhat on the severity of the attack, but more especially on the circumstance as to whether the digestive or respiratory system is the chief focus of the malady.

"As soon as the affection declares itself, the animal ceases to take any kind of food, and in most cases even refuses water. Rumination is suspended; and the animal stands with its head drooping and the ears drawn back. If made to move, it shows great prostration of strength, and frequently staggers as if about to fall. The skin is hot in places, and often remarkably so between the flanks, the hind ones in particular. An exudation early takes place from these parts, and is succeeded by cracks and sores. The hair is staring, especially along the upper part of the neck, shoulders, and back. The extremities are cold, even at the commencement of the disease—and in a later stage the increased heat of the surface of the body gives place to a remarkable coldness, especially along the course of the spine.

"Tears trickle from the eyes, which are red and expressive

of suffering, and a watery discharge flows early from the nostrils. There is a continuous increase of these secretions, which become more or less purulent in the advanced stage of the malady. The mouth is hot, red, and 'furred,' often presenting here and there raw-looking spots, especially on the inner side of the lips and along the roof. The breath is fetid. The respiration is increased, and generally accompanied with a moan in the advanced stages. A slight cough is also present in some cases. The pulse is quick and weak, and scarcely to be felt, excepting at the heart, even at the commencement of the disease.

"The bowels are sometimes torpid at the outset, but diarrhoea, leading to dysentery, mostly follows, the evacuations being slimy, and of a dirty yellow colour, occasionally tinged with blood. Tenesmus is likewise present as a rule. Slight tremors of the muscles of the shoulders and thighs are to be observed in some cases, and so also in an emphysematous condition of the skin along the upper part of the back. In milch cows the secretion of milk is quickly arrested, a remarkable diminution in the quantity taking place, as one of the early indications of the attack. As the disease advances towards a fatal termination, the prostration of the vital powers becomes more marked, the breathing short, quick, and more painful, the

alvine evacuations fetid and more slimy, and the surface of the body deathly cold. The animal will sometimes sink as early as 12 hours from the commencement of the attack, but in many cases the disease will be protracted to the fifth or sixth, and occasionally to the eighth or ninth day.

"The period of incubation of the disease is found to vary, the majority of the animals sickening on the tenth day after exposure to the infection; but some have been attacked on the seventh day."

This letter having been read, it was moved by Mr. Thompson, and carried, that the thanks of the Council be given to the Lord President, for the communication with which he has favoured them on the subject of the Cattle Plague, and that his lordship be requested to give instructions that any further information that the Government may receive on this subject may be communicated to the Secretary of the Royal Agricultural Society as early as possible, with a view to its immediate publication.

The usual leave of absence was granted to the Secretary, and the Council then adjourned over the autumn recess to Wednesday, the 1st of November.

THE YORKSHIRE AGRICULTURAL SOCIETY.

MEETING AT DONCASTER.

Under what may be termed new management, and with a certain additional interest imparted thereby to the proceedings, the great Yorkshire Society paid its visit to Doncaster under very encouraging auspices. The selection of the site was in itself an especial advantage, as there are few towns better calculated to entertain a large gathering, although the inhabitants, with their annual Leger week in the way of a precedent, may be too ready to spring at once to war-prices. However, the neighbourhood, in some return for any such prospective profit, had contributed very liberally to the prize-sheet; and the new Secretary could by no means complain of having his energies crippled from any want of funds. In fact, he was enabled once more to go beyond the customary programme of an agricultural exhibition, and to add on a few classes of fox-hounds to the horse, cattle, sheep, swine, and poultry sections of the Show. Through the repute into which he brought the little Cleveland Society, Mr. Parrington's administrative powers have been well known for some time past, and a glance over the ground at Doncaster assured us that the master-mind was still busy at work on every available improvement. Prominent amongst the additional facilities for the public, rendered so necessary by the increasing popularity of these occasions, was the adoption of the telegram board placed in the centre of the ring where the judges were engaged, and upon which was given the number of the class under inspection, the winning figures being run into the vacant slide beneath, immediately that the award was settled. It is almost impossible to conceive the amount of trouble and annoyance saved by such a plan—one we must say, in justice to ourselves, that we were the first to suggest to the direction of the Royal Agricultural Society some years since, and that now may very probably be brought into use at the national meetings, as Mr. Milward, Mr. Dent, Sir John Johnstone, and Mr. Wilson, all members of council, must have seen how well the system answered at Doncaster. Then the rings were kept scrupulously clear of people who had "no business" there; and, until the rain set-in, a deal of the duty of each day was got through with nice method and commendable despatch. The Tuesday, as heretofore, was devoted to the trials of the implements; but this, at

best, can be considered little more than a bye-day; and, with lowering, threatening weather, very few people were present to watch the several machines put through their paces. These were confined to thrashing machines and grinding mills, both of which did some very good work in competition, the cleaning from chaff and self-delivery into the sack being an especially noticeable feature in the performance of the thrashing machines, and a point for which the Taskers received a medal. The first prize, however, it will be seen, went to the new limited company of Marshall and Sons, with another limited liability concern, now known as Robey and Co., second, and the old house of Ransomes and Sims still standing on its own original foundation, taking all sorts of prizes and commendations for every variety of implement. On the same principle that a new whip was awarded the huntsman who had brought hounds the greatest distance to the show, a cup should have been presented to the famous Ipswich firm, though this doubtless found its return in other ways, as the prize-list will prove. There was a long array of stands backed by rows of engines and larger machines on the ground, the Yorkshire and other North Country manufactories being, of course, very strongly represented; and through these the judges carefully proceeded, on the look-out for actual novelty or further improvement, with a view of testifying to this by the allotment of certain miscellaneous moneys at their disposal. But here again the return will be the best commentary, if we merely add on authority that the work made by the grinding-mills sent to trial was very generally good; although, as will be seen from a letter in another column, some of the trials, more particularly of the thrashing machines, were not considered sufficiently searching to be reliable.

Hitherto the judges of cattle, sheep, and pigs have been summoned for the Wednesday, and the heavy and light horsemen for Thursday; but under the new arrangement all these several sets commenced early on the former day, thus leaving the Thursday and Friday open for the parade in the ring, or more systematic inspection in the boxes; a certain zest still being given to the Thursday by the hounds being brought upon the flags, and Blair Athol, the famous Derby and Leger winner, led forth

in all his lonely grandeur at stated intervals. But even hounds and horses are not quite everything to a Yorkshireman, and it is amusing to notice how the public turn and return from one ring to another. At one minute they have the thorough-bred stallions under view; at the next they are criticising the companion-class of coach-horses; and then they are off to see what is doing with the Shorthorns. Somewhat curiously, considering that this is the home of the breed, the Shorthorn cattle, although no other sort is ever exhibited, do not muster in any great numerical force at the All-Yorkshire Meetings, and the best old bull of the Doncaster show came all the way from Scotland. This was Lord Strathallan's Posco, the second at Newcastle last summer, and who really seems to have gone on improving ever since we last left him. The white is now as level and true as a working bull need be, and in a small and not otherwise strong class he at once placed himself; Lord Pam, the second, though an animal of some repute, being very slack behind his shoulder; and the third but a middling beast in any company. The two-year-olds were, by simply counting them up, in more force; but they were only a rough lot in the bulk, and with not a first-class bull in the entry. Mr. Middlesborough's Prince of Wales is certainly a deep, heavily-fleshed animal at his age; but he is pulled down by a bad thin "papery" touch, and he had to yield accordingly to a Bates bull of Mr. Taylor's, with some style about him, as he went round the ring; but that, nevertheless, does not promise to grow up to his present pride of place. In so many words, as with Doctor Fell, we don't like him; while the third prize was almost, if not actually, deformed; and the neat, but light, Baron Blencow, fresh or stale from Plymouth, had thus to be content with a commendation. In another very middling field of yearlings, Friar Tuek, looking little the worse for his travels, won as easily as the Scotchman did in the first class; but his brother, Friar Bacon, found some far more formidable opposition amongst the calves, where he was fairly beaten by Mr. Foljambe's Robin, quite a grand young bull, with plenty of length and fashion, a famous touch, and the walk of a race-horse. Of course, the natural question at once arose as to why Robin did not show at the Royal? and to which Mr. Woods straightway replied that Plymouth was too far off to send on young things, or old either; as it is said that a circular is now in the course of signature, the object of which is to prevent the national meetings being ever again held at such inconvenient distances from everywhere. Still, had Friar Bacon been also reserved for the home show, he could have finished no higher than a good second; and the rare quality of Master Hope-well was enough to secure him the third prize, to which the Yorkshire Society is here extending its encouragement. The cows and heifers were altogether better than the male animals, a fact proved by the Doncaster Champion Cup being awarded to Lady Fragrant, to whose extraordinary improvement we spoke when we saw her at Plymouth. Lord Feversham's Princess, again, we reported of as going on famously, while his Lordship matched her here with a deep square heifer, if not quite so elegant, though Captain Oliver divided them with a very pretty little white, rather under-aged for her class, and a curious comparison to Mr. Eastwood's Lady Emily, the best calf at Howden, since when she has grown wonderfully, but lost style in proportion as she increased in breadth and depth. The heifer-calf class here was one of the best of the show, but with Mr. Foljambe again to the fore with a half-sister to Robin, as also by Imperial Windsor, and another, so good and clever all over, that our only regret would be to see stock so full of promise exhibited at so early an age. We have always been inclined to consider these calf classes a mistake, although it is but right to say that breeders seem to take to them very kindly.

Lady Fragrant had not much to beat until it came to the cup race, when they pitted Robin against her, and this, despite something to pick from in a very fair class of cows, where Pride of Southwicke was in blooming condition, and indeed has seldom looked better. Then Perfume, so neat and trim and tasty, was all her trainer could make her, and Double Butterfly wearing a deal fresher than when these gay beauties get further a-field. Queen of the May, however, was scratched, from being dead amiss, and so the second prize went to a great fine well-grown cow of Mr. Dugdale's, but bred by Mr. Hales in Kent, and hence her title. Mr. Workman sent a curiosity into this class that looked more like dairy purposes, and that grand old ruin Prince Alfred took the first-class medal in the extra stock, one or two of the judges maintaining that he would have stood well in for the champion cup, had the conditions rendered him qualified to compete. We do hope yet to get a sitting at the Prince, if it be only to show what the sign of "the Bull's Head" should be.

The sheep show, but a short one, depended mainly on the Leicesters, of which the shearling rams were a capital class, and where Mr. Borton again won everything. His first ram was first at Plymouth, and in the old class his first was second at Plymouth and first as a shearling at Newcastle, with second prizes and commendations two or three deep, still speaking to the increasing excellence of the Barton flock, which now wins as easily abroad as it does continually about home. Mr. Marshall also repeated his West Country triumphs with his Improved Lincolns, but not without some creditable competition; and Lord Wenlock had it all his own way with the short-wools, a kind of Shropshire-Southdown, and a useful sheep no doubt, but not very imposing in appearance, which did not seem to tell much with Messrs. Druce and Purves; though it is right to add that Mr. Simpson's four-shear down ram, pronounced to be a very good sheep, and which took the first-class silver medal in extra stock, was also bred by Lord Wenlock.

It is questionable whether a big pig is ever quite appreciated out of Yorkshire, where Mr. Wainman, Mr. Dyson, Mr. Dickin and others gain great fame, and "some reward beside," by their monster whites. Some of the large sows were very good, and not so coarse as they commonly run; but the two best classes of swine were the small boars and small sows. The judges gave a general commendation to the latter, and the first prize boar was the best pig in the yard. He is good all through with capital shoulders and fore-quarters, a rare back, and, moreover, a nice coat, or in fact, with some covering in the way of hair on him. We were pleased, indeed, to see that the judges, as in the case of Lord Wenlock's young sow and other prize-takers, clearly made this question of coat a leading point; for nothing looks worse, or wears worse than a bare pig, though to nothing are we more certainly coming. It is an abuse that the awards can perhaps alone correct, and it is, we repeat, satisfactory to record that the decisions at Doncaster should go to check so growing an evil. The second-best small boar, a famous one to meet, and rather better than Mr. Mangles' about the head, was first the other day at Plymouth, and the Givendale pig a Royal first at Newcastle, whence he takes his title, for names are given to pigs in Yorkshire almost as religiously as they are to horses or children. The pigs of any breed not qualified to compete as large or small seem to depend mainly on the bigger sorts for their excellence, such as it is; and of the pigs for use, that is stores, Sir George Wombwell and Mr. Walton sent two famous pens, which finished first and second, with due discrimination evinced over their relative merits, Sir George's being particularly good about their necks and shoulders. Of course the colour

ran all through upon white, and an Essex or Berkshire breeder would look in vain for anything of a darker hue, Mr. Hutton's big prize sow being, we believe, the only entry on the ground with even a stain on her skin.

Compared with Plymouth, the horse show at Doncaster was a great success; and a wonderful thing if it had not been, when we take into consideration that in one place they think and talk of nothing but Leger winners, fair-days, and good steppers, and in the other of squadrons, salutes, regattas, oars, and boats. The arrangements and conduct of the horse show under the experienced direction of the new secretary were almost perfect, and we have no doubt that everything would have worked well on the Thursday if it had not been for the torrents of rain, which put a damper upon everything. The horse ring itself was first-rate. During the judging it was divided by a centre rail, forming companion rings for two sets of judges; but this demarcation line was afterwards removed, thus making a grand circle for the promenading of the different classes. If there was one thing wanting, it was a little more pasteboard—a point we have insisted on over and over again; that is, the horses should be numbered on both sides the head—not with flying strips, but thick pasteboard, or rather painted leather—a number *for the judges* by all means, and also one *for the public* a customer that the real itinerant showman or accomplished Barnum never forgets, as upon such depends the continued success of these meetings. We allude more especially to the business of the first day, at half-a-crown a head, when, through this slight omission, the catalogue was next to useless, without a man had the legs of Spring-heeled Jack, or the perseverance of a Drinkwater, to dodge the horses round and round the ring. The boxes and sheds were a great improvement on Howden; but, if anything, some of the horses were a little too much boxed up; for if a groom liked to turn the key, and veed his way with some insidious treating-friend to the refreshment booth, and there, o'er a glass of Hodges, Bass, or Burton, dilate upon the wonderful points or splendid action of the animal he was in charge of, the interested and paying public might wait and whistle in vain for a view. This in future may be prevented by having shifting sides, open in the day and closed at night, as already adopted at the Royal meetings. Of thorough-breds there was a large display; and one of the great attractions of the show, if not the greatest, if we may judge by the eagerness with which the crowd rushed to the ring on his parading it twice a day, was Blair Athol, the Olympian hero of '64, who was kindly sent by his owner to be exhibited, but not to contend for a prize. Everybody's mouth, both lads' and lasses', was full of the praises of Blair Athol, as well as "Butter Scotch," a sweetmeat in great vogue in the town of Doncaster, and, as we are told, throughout Yorkshire. We must say that we delight in seeing a brawny, middle-aged man with his mouth crammed full of lollipops, as it shows that he has still sweet reminiscences of the little kindnesses of his poor dear mother. A great many, though, seemed to prefer "ginger." We can join in the praises of Blair Athol without the Butter Scotch, for he has much thickened since put to the stud, while he danced round the ring with his springy action as if hung upon wires. Many of his fond admirers made him out the winner of great races he never started for, and as having beaten horses he never met.

Now to go along with the judges, who commenced their labours between eight and nine, beginning at the beginning this time with the thorough-bred stallions for getting hunters, instead of keeping them to the last, as they were wont to do. The two prizes of £25 and £10 brought together no less than seventeen; the first on the list being Antwerp, the second-prize horse at Howden

last year, and of whom we thus wrote:—"Antwerp is a dark brown, about fifteen-three, with a good head, fine, strong, well-made neck, running into a beautifully well-laid shoulder, capital round barrel, first-rate back and loins, with good quarters, thighs, arms, and wiry short legs. He is a picture of strength and hardiness, being muscular and vigorous as a gladiator, but, withal, the gentleman. It is seldom we have seen a country stallion that we have liked better, and must own that after our eyes had once rested on him they would not take to any of the others." The next was King Brian, a useful country stallion, and a horse of great substance, with a good sensible head, a long neck, capital top, and big short limbs; while he is a fair mover, but so frightful a disher that his highness when trotting would scarcely get along some of our old lanes and bye-ways without brushing the banks. Then came the sweet-headed, blood-looking, clean-limbed Skirmisher, beautiful to look at, but a little light in the middle; and the very neat and showy deep-topped, short-legged Drumour, against whom, barring a little heaviness at the point of his shoulder, there was not much to say, combining as he does strength with light free action and line quality. The fifth was Cawston, a nice-looking, compact, big-framed, and big-limbed horse, as a hunter all over; but in his action he drew his hind legs after him in a wide straggling manner, as if they were of very little use, and in a way that was anything but pleasing to the eye. After him, the weedy Pax, the vulgar wooden-looking Llanwryst, the renowned game old Yorkshire Gray, who looked more of the neat hack or hunter for a light-weight than a sire, and the short-necked, goodish-middled, leggy Rivet, that we did not fancy. Then, there was Richmond, a very useful horse, long, low, and muscular, with capital ends and limbs; but Engineer we consider a brute, and The Swell a misnomer, who surely ought to have been called The Snob, for a more vulgar, half-bred-looking dandy in the shape of a thorough-bred we have seldom seen. With old Sharston time had worked wonders, and left behind but a faint memento of the past, though Aribbas was all over a neat one, and for symmetry, action, and the way he carried himself, take him all in all, one that few on the ground could beat. Croton Oil at twenty-four years of age is still a game-looking old horse of great character, with a long light middle, good ends and limbs; and last, though not least, came St. Clare, a horse that we look upon as a curiosity, for his head is wrong, his neck heavy, and his shoulders go too far into it. He has certainly hunting withers; but withers alone will not make a hunter. His back is slack and hollow, and he is leggy though big in the limb. We were going to say he looks like a coach-horse, but we hardly know what he looks like; certainly not a thorough-bred sire or a hunter. And if, as we said last year, "he is not to be found in the Stud-Book, his owner might as well have entered a Clydesdale," as he cannot comply with these conditions, and the prizes must be withheld. The first of these went to Cawston, the second to St. Clare; and if ever any Judges went for quantity instead of quality, they did at Doncaster on Wednesday last, when they awarded that second premium in the way they did. The reserved horse was King Brian. For the £50 for thoroughbred stallions, to serve mares in the neighbourhood of Doncaster, Antwerp, Pax, Llanwryst, Aribbas, Engineer, The Swell, Sharston, Poynton, and St. Clare again entered the circle, the prize going of course to St. Clare. The hunters showed a falling off, after the Howden Show of last year, as rather weak for Yorkshire, for one looked in vain for such horses as Melton, Sprig of Nobility, Highwayman, and Sir Robert Peel. The hunting brood-mares were good, Mr. Tindall winning with a level, deep-ribbed, powerful mare,

with fine big limbs, but an upright shoulder. The second, Miss Nightingale, was a varmint old mare, of an out-and-out good stamp; a rare shape, without lumber, and that looked going in her time with any hounds. Old Marigold, the dam of Melton and Sprig of Nobility, showing better than ever, with a foal by her side, and the winner of a host of prizes, was in the ring, as also Maid of the Meadow, a powerful one, but lacking quality, of Mr. Everett Jackson's; while Mr. Mellows, Mr. Hodgkinson, and Mr. Snowden showed a fair style of mare, and Mr. Oliphant a relict of the past—the remains of a good sort. The two year-old hunting geldings were not first-rate, Mr. Boynton's chestnut being neat, but with not the best of shoulders; and Mr. Shepperd's bay being long, low and hardy-looking. Mr. Leaf had a chestnut of some character forward, but there was a lamentable falling-off behind. The two-year-old fillies were no great improvement on the geldings; Mr. Wightman's first being a filly of great power, lengthy, with short, big limbs; and Mr. St. John L. Clowes, by Aribbas, very neat, but light of bone. Mr. Tetlow had a long, big-boned filly; but Mr. Viekers's "Miss Smith" was anything but a hunter to look at. Of the three-year-olds, with fourteen entries, eight only were shown, Mr. Clark's Patient, an old-fashioned colt, no beauty, with a bad eye, but a good mover, being placed first, and a rather good-looking brown of Mr. Meiklewaite's second; whilst Mr. Booth's Buffoon, one of the nicest-formed horses we have seen for a long time in the shape of a hunter, as on whom, at the outside of the ring, they were betting two to one, was nowhere! and Mr. Bean, of York, had also a nice, showy, corky bay in this class. The three-year-old fillies were good, Alice by Lord Fauenberg being very powerful and compact; Mr. Sykes' Gem good-shaped and wiry; and Mr. Bently showed a good stamp by Glauens. With an entry of nineteen, and nine only shown, Mr. Jackson Everatt was first with Memnon, a clever, compact horse, with rather small joints; the second, Mr. Percy's Ingleby, the prize horse at Islington, who was also second to Memnon last week at Raseu, being a good-looking, stout horse, with fine limbs, but a little too much flourish in his paces for a hunter. Mr. Clark's Cotton Stockings is a horse of some character, but he went very short; and Mr. Lister's Woolwich, a lengthy grand-looking horse of some quality, that would not be out of his place as a hunter, a charger, or in the park. Mr. Marley's Blondin was a short, two-ended horse; Mr. Swinbick's Gil Blas, a light blood-like hunter, and Mr. Batty's also of a fair stamp. The first and second four-year-old hunting fillies were two neat ones in a very small class. The five-year-olds, possessing not less than three crosses of blood, with ten in the ring, went to Mr. Darley's Camillus, a good topped horse, with a beautiful blood-like head and neck, but light of bone below the knee; while the second prize, Springwater, was also a very neat mare, with rather a long waspy middle. Mr. Maynard's Shrubland was a nice showy horse, with light head and neck, and Mr. Pease's Silas Marner looked as stout, compact, and short on the leg as ever. Mr. S. Levison Lane's Sportsman was a rare good sort, up to weight, long, deep, powerful, and short on the leg, as a prize horse at Stockton, Middlesboro, and Ripon; and Mr. Booth had a fine mare in Ballet Girl, but with barely the three crosses in her appearance. The six-year-old geldings or mares were a poor class, and but few anything like hunters. The first, Peter, is a slashing blood-like horse, but in his paces he went round and high, more, in fact, as a charger, whilst Conjuror was all over a hunter, as moreover he went like one. Mr. Barton's Viscount was useful-looking forward, but fell off behind; and Mr. Barker's Sultaness had the winner's failing, and

looked and went more like a light charger. Mr. Smith's Patch was a stout, but apparently not much of a mover; Mr. Greetham's King Dan not a bad sort, and Mr. Bentley's Corringham up to weight at a certain pace.

The roadsters were not in great force, nor was there anything very grand about them for Yorkshire. The first prize stallion, Pride of the Isles, was a small kind of Norfolk trotter, with a round heavyish shoulder and head very badly set on; the second Merrylegs, a compact big-limbed horse with a vulgar head, but a good mover. Mr. Warburton's Pride of Engand was very handsome, and Mr. Read's Qui Vive, a useful sort for a Brougham or heavy dog-cart; while Mr. Laycock's Young Merryleggs looked dull in his coat, and leggy, and light in his middle, but he moved well. The roadster brood-mares were but three, Bonny being a stout, short, rather vulgar mare, and Gipsy of a good stamp, long and low, with lots of character; but the other, Mr. Hawley's Nancy, was just a clever little hack. The three-year-old roadster geldings or fillies were a poor lot, the first, Mr. Lofthouse's, being just a common old-fashioned sort that one generally sees now-a-days with a butcher up, shouldering his tray. The second, the property of Mr. Norton, had a good frame, limbs, and action; and Mr. Clowes, whose runner knew how to show a horse, had a clever lengthy filly that was also a good goer. Of the hackney mares and geldings we did not see much, having only just time to note two or three old friends, namely, Crafty, who took the first prize, Mr. Pease's Whitefoot, and a nice old flea-bitten cob of Mr. Richardson's, when a thunderstorm broke over-head, down came the rain in earnest, and away went the judges and the court helter-skelter, as if old Judge Jefferies himself had risen up amongst them, and was going to hang the lot. The gentlemen's cobs were anything but a gentlemanly lot, the only gentleman among them being Rory O'More, a cream-coloured Irish horse, the property of Mr. Hadsock. The first prize, Robin, was a strong, useful cob, with not the best hind-leg action, nor remarkable for very good looks, whilst the second was a stony, useful on wooden legs, and woe to the gentleman of sixteen stones that trusts so much real property on so an unwieldy a heap! while Mr. Norton's Tom Sayers was a long, vulgar cob, with action rough enough to shake all the shape out of any sixteen-stone citizen in the kingdom. There were one or two nice hacks shown as ladies' horses—the first, Dandy, being a neat corky galloway, very fair in his paces; and the second, Mr. Clowes' brown mare, about as neat a hack, with plenty of blood, as one would wish to see. Mr. Bentley's bay looked and went like a lady's horse; and Mr. Benson's Betty, though not a beauty, was about the best goer, bringing her hind legs well under in her canter. Among the ponies over twelve hands there were some very nice ones, but nothing to startle the eye like King Pippin at Howden last year. Victoria, the first pony, is of a rare shape, with power, and Mr. Milward's Rachel, the second prize, also a very nice one. Amongst the others that struck us were Sir W. R. C. Cooke's Second to None, Mr. Linley's Willie, Mr. Hodgkinson's remarkably gay, showy little fellow Rapid Rhone, Mr. Mapplebeck's Charlie, Mr. Bentley's Gray Charlie, Mr. B. Johnson's Cariboo, and Mr. Ireland's Jerry. There were some nice ponies also under twelve hands, and among them Mr. Dugdale's General Tom Thumb, Mr. Richardson's Uncle Tom, the first prize, Mr. Barker's Roland, Mr. Haggis' Billy Minute, and Mr. Bentley's Brown Charlie. The second prize went rather to the beseeching looks of an indefatigable little lad in boots, than to the rat of a pony he was riding about all the day; and from this we draw this conclusion, that if a young lady had been up in the palfrey class, and had cast such beseeching looks on Mr. Bennett or Mr. Hobson as this lad did,

when they were looking out for a second for the pink ribbon, or tipped one a winning smile and the other a dieaway, no matter whether she had been on a brown all legs and wings, a wooden-going grey, or a model Suffolk Punch, we feel quite satisfied she would have carried off the colours. As a nod is as good as a wink, we shall expect to see some ladies up by next year.

The coaches were very well represented throughout, if not in numbers so much as in quality. The first-prize stallion, Prince Arthur, is a very grand-looking horse, a dark bay Cleveland, though perhaps not so good a mover as some of the others, and he was the first-prize at Howden last year also. The second, Candidate, was a strong well-built horse, with big limbs, and a good stepper; while Mr. Haig's Brown Harkaway had good action, as had Mr. Dawson's Scrieveton. Amongst the others that caught our eye were Mr. Denby's Rawcliffe and Liverpool, and Mr. Benton's Nobleman. The brood mares with foals were a capital class, old Venus, who has taken the prize four years in succession, being again the winner. We have often described her in these columns, and she only wants seeing to be appreciated. The second, Lady Manor, was another great prize-taker, and of a first-rate stamp, as were Mr. Coulson's Bess and Mr. Benton's Polly Hopkins. In the two-year-old class the second prize struck us as being a little coarse, and the first as rather a nice colt; and in the fillies, with only two entries and a prize for each, they were of about the same calibre, the best being a very neat one, and the second more common-looking. The three-year-old geldings' prize was taken by a good one of Mr. Johnson's, that has won already at Scarborough and Driffield; but the second was rather leggy. The three-year-old fillies were a nice lot, and went as they stood in the catalogue, the third and unrewarded one being Mr. Robinson's Rudby Lass.

The agricultural horses were in strong force, but the principal competitors in many classes were old stagers, and as well known in the agricultural world as Professor Simonds, Alderman Mechi, or Mr. Fisher Hobbs, and had met one another almost as often. For instance, there were Lincolnshire, the Newcastle horse Champion, a Clydesdale famous in Yorkshire and Dublin, and Young John Bull, the Worcestershire prize horse, all now in competition. Lincolnshire beat Champion at Howden last year; but Champion had beaten Lincolnshire previously, and now beats him again at Doncaster. Champion is a beautiful specimen of the Clydesdale, as active as a kitten, and as good-looking as he could be. Indeed, it was a treat to see him move, when bearing in mind the tons of flesh one has to meet with in the shape of cart stallions, going along as if they were a burden to themselves. The Worcestershire horse, a fine specimen of the dray-horse, beat the Newcastle winner for the second place; while Champion also put in a bid for the £50 for serving mares in the neighbourhood of Doncaster, and, with nearly the same competitors, of course was awarded it. There were many fine specimens of the cart stallion, but, rain coming on, they were ordered in almost as soon as they were out on the second day for parade. For brood mares with foals suckling, Mr. Tennant's well-known sturdy blacks, Trip and Jet, put all other competitors in the back-ground; and another of Mr. Tennant's, a very useful grey, was first in the three-year-old class; as was Mr. Norton in the four-year-old, without opposition, with Conqueror, a neat, light, active cart-horse. The catalogue was strong in entries of agricultural horses, but many of the classes did not turn out half the numbers put down; and the pride of this section centred on the stallions, over which the judges daltied for between two and three hours before they ever came to a decision.

Tuesday, as we have said, was dull and threatening,

while Wednesday, with showery weather during the morning, broke out into a thunder-storm about four, and rapidly cleared the ground; and on Thursday more heavy rain fell about mid-day, to the total discomfiture of the fox-hound judges, who had to get through their remainder as best they could. Lord Wemyss once more carried off the chief prizes, as he was wont to do in the Cleveland country, though the competition was not up to what we have seen in the North Riding, and huntsmen would appear to require a deal of enticement, in the way of supplementary premiums for themselves, to induce them to enter. But there is no prettier sight, on a fine day, than a hound show, with the men grouped about in their scarlet coats, whereas the elements went all against this at Doncaster, about the only thing that the management had not properly provided for. Let us, still, always except an official prize list, which a society of such calibre should certainly give, as it is unfair alike to the exhibitors and the public not to do; but this is an old and now almost a solitary grievance. There was a dinner, at which the retiring president the Duke of Devonshire took the chair, to be succeeded in turn by the Honourable Admiral Duncombe in 1866, when the meeting will be at York, where as a rule it should be held every third or fourth year.

PRIZE LIST.

CATTLE.

SHORTHORNS.

Judges.—W. Bartholomew, Waddington Heath, Lincoln.

J. Douglas, Athelstaneford, Drem, N.B.

G. Drury, Holker Hall, Newton-in-Carmel.

Bulls above three and not exceeding six years old.—First prize, £20, Viscount Strathallen, Strathallen Castle, Auchterarder, Scotland (Pescot). Second of £10, R. J. Middleborough, South Milford (Lord Bam). Third of £5, J. Dickinson, Partridge Hill, Baxtry (Royal Oak). *Commented:* P. Brown, Glenworth, Lincoln (Masterman).

Bulls above two and not exceeding three years old.—First prize, £20, J. Taylor, Moreton Whalley, Lancashire (Shannon). Second of £10, J. R. Middleborough (Prince of Wales). Third of £5, W. White, Burrell, Bedale (Prince Arthur). *Highly Commented:* J. Charlesworth, Headfield, Bewsbury (Baron Blencow). *Commented:* T. Dawson, Ponnalsworth, Driffield (Next of Kin), and E. Hodgkinson, Morton Grange, Retford (Highland Duke).

Bulls above one and not exceeding two years old.—First prize, £20, F. H. Fawkes, Farnley Hall, Oley (Eriar Tuck). Second of £10, S. Wiley, Farnley, York (Earl of Derby). Third of £5, J. Peacock, North Holme, York (Veteran). *Commented:* Rev. J. D. Jefferson, Thicket Priory, York (Duke of Waterloo).

Bull calves above five and not exceeding twelve months old.—First prize, £10, G. S. Foljambe, Osberton Hall, Work-sop (Robin). Second of £5, F. H. Fawkes, Farnley Hall, Oley (Eriar Bacon). Third of £2, T. C. Booth, Warlaby, Northalerton (Master Hopewell).

Cows of any age above three years, in-calf or milk.—First prize, £20, Lord Feversham, Duncombe Park, Helmsley (Pride of Southwicks). Second of £10, A. Dugdale, Rose Hill, Burnley (Kent Cherry). Third of £5, Lady Pigot, Branches Park, Newmarket (Perfume). *Highly Commented:* J. R. Middleborough (Gay Lady). *Commented:* R. Eastwood, Thorney Holme, Clitheroe (Double Butterfly), and J. Taylor (Eugenie).

Heifers not exceeding three years old, in calf or milk.—First prize, £15, T. C. Booth, Warlaby (Lady Fragrant). Second of £5, Lady Pigot (Lady of Rossald).

Heifers not exceeding two years old.—First prize, £15, Lord Feversham (Princess). Second of £5, R. E. Oliver, Sholebrooks Lodge, Towcester (Campanella). *Highly Commented:* Lord Feversham (Violet). *Commented:* R. Eastwood (Lady Emily).

Heifer calves above five and not exceeding twelve months old.—First prize, £10, G. S. Foljambe, Osberton Hall, Work-sop (Rose of Windsor). Second of £5, Messrs. Dudding, Pantou House, Wragby (Pride of Pantou). *Highly Commented:* R. Eastwood (My Mary). *Commented:* Lady Pigot (Victoria Rubicunda), and R. E. Oliver (Chrystallina).

The Champion Cup, value £25, for the best animal in any of these classes, to T. C. Booth, Warlaby (Lady Fragrant).

CATTLE OF ANY BREED.

Cows for dairy purposes.—First prize, £7, Lord Londesborough, Grimston Park, Tadcaster. Second of £3, E.

Hodgkinson, Morton Grange, Retford (Ruth). *Commended*: W. Jenkinson, Cadeby, Doncaster.

EXTRA STOCK.

First-class Silver Medal, T. C. Booth, Warlaby (Shorthorn bull, Prince Alfred). Second-class Medal, G. S. Foljambe (fat steer).

SHEEP.

LONG-WOOLS.

JUDGES.—J. Buckley, Normanton Hill, Loughborough.
H. Mackinder, Langton Grange, Spilsby.

L E I C E S T E R S .

Shearling Rams.—First prize, £15, J. Borton, Barton House, Malton. Second of £5, J. Borton. *Commended*: J. Borton, for three other rams.

Rams of any age.—First prize, £10, J. Borton. Second of £5, J. Borton. *Commended*: T. Marris, The Chase, Uckby.

Pens of five Ewes.—First prize, £10, W. Angus, Neswick, Driffield. Second of £5, J. Simpson, Spofforth Park, Wetherby.

Pens of five Shearling Gimmers.—First prize, £10, J. Borton. Second of £5, J. and E. Tindall, Knapton Hall, Riblington. *Commended*: W. Brown, Highgate, Holme, on Spalding Moor, and R. Lovel, Knapton, Riblington.

LINCOLN AND OTHER LONG-WOOLS.

(Not qualified to compete in Leicesters.)

Shearling Rams.—First prize, £15, T. B. Marshall, Brantson, Lincoln. Second of £5, T. B. Marshall. *Commended*: E. J. Howard, Rise Farm, Nockton, Lincoln.

Pens of five Ewes.—First prize, £10, R. C. Workman, Almholme, Doncaster. Second of £5, W. Mellows, High Melton, Doncaster.

Pens of five Shearling Gimmers.—First prize, £10, R. C. Workman. Second of £5, T. B. Marshall.

SHORT-WOOLS.

JUDGES.—J. Druce, Eynsham, Oxford.
P. Purves, Alconbury, Huntingdon.

Shearling Rams.—First prize, £15, Lord Wenlock, Escrick, York. Second of £5, Lord Wenlock. *Commended*: T. Marris. Pens of five Ewes.—First prize, £5, Lord Wenlock, Escrick, York. *Commended*: Lord Wenlock.

Pens of five Shearling Gimmers.—First prize withheld. Second of £5, J. Brown, Rossington, Bawtry.

EXTRA STOCK.

First-class Silver Medal, Joseph Simpson, Spofforth Park, Wetherby (for four-shear down ram). Second-class Silver Medal, W. Brown, Highgate (fat Leicester three-shear ewe).

P I G S .

JUDGES.—J. Druce, Eynsham, Oxford.

P. Purves, Alconbury, Huntingdon—,
J. Buckley, Normanton Hill, Loughborough.
H. Mackinder, Langton Grange, Spilsby.

Bears of a large breed.—First prize, £5, W. B. Wainman, Carhead, Crosshills, Leeds. Second of £2, R. Dickin, Old Road, Stockport. *Highly Commended*: J. Dyson, Dock-street, Leeds.

Sows of a large breed, in pig or milk.—First prize, £5, J. Dyson, Leeds. Second of £2, R. Duckering, Northorpe, Kirton-in-Lindsey. *Highly Commended*: S. S. Jackson, Nelson-street, Halifax. *Commended*: C. W. Graham, York-road, Leeds.

Boars of a small breed.—First prize, £5, G. Mungles, Givendale, Ripon. Second of £2, R. Dickin. *Highly Commended*: J. Brown, Rossington, Bawtry, and Wm. Parker, Golden Lion Inn, Bradford.

Sows of a small breed, in pig or milk.—First prize, £5, Lord Wenlock, Escrick Park, York. Second of £2, M. Walton, Foundry-street, Halifax. *Highly Commended*: B. Calvert, Myrtle-place, Bingley. The class *Commended*.

Boars of any breed, not qualified to compete as large or small. First prize, £5, R. E. Duckering. Second of £2, C. W. Graham.

Sows of any breed, in pig or milk, not qualified to compete as large or small.—First prize, £5, M. Walton, Foundry-street, Halifax. Second of £2, J. Norton, Nortonthorpe Hall, Huddersfield.

Three Store Pigs of any breed and of the same litter, from four to nine months old.—First prize, £5, Sir G. O. Wombwell, Bart., Newburgh Park. Second of £2, M. Walton.

PIGS NOT EXCEEDING TWELVE MONTHS OLD.

Boars of a large breed.—First prize, £3, J. Dyson, Adelphi Hotel, Leeds.

Sows of a large breed.—First prize, £3, R. E. Duckering. Boars of a small breed.—First prize, £3, Wm. Parker. *Commended*: C. W. Graham.

Sows of a small breed.—First prize, £3, Lord Wenlock.

EXTRA STOCK.

First-class Silver Medal, S. Wiley, Brandsby (litter of pure small bred pigs, ten weeks old). Second-class Silver Medal, M. Walton, Halifax (gilts, seven months, middle breed).

HORSES.

HUNTERS AND ROADSTERS.

JUDGES.—J. E. Bennett, Bosworth Grange, Rugby.
G. A. Grey, Milfield, Wooler.
W. E. Hobson, Kettlebythorpe, Briggs.

COACHING AND AGRICULTURAL HORSES.

JUDGES.—W. Robinson, Hutton Hall, Ovington, Darlington.
B. Wilson, Brawith, Thirsk.
C. Wood, South Dalton, Beverley.

Thorough-bred Stallions for getting Hunters.—First prize, £25, J. Peacock, North Holme, Oswaldkirk, York (Cawston). Second of £10, J. Smith, Hut Green, Pontefract (St. Clare).

Thorough-bred Stallions, not less than four years old, for getting weight-carrying hunters, to serve mares within a radius of 15 miles round Doncaster staying one whole day in each week in the town during the season 1866, at a charge not exceeding 4 guineas each mare, including the groom's fee.—Prize of £50, J. Smith, Hut Green (St. Clare).

Stallions for getting Coach-horses.—First prize, £20, J. Johnson, Brigham, Driffield (Prince Arthur). Second of £5, R. Gill, Kettlefield, York (Candidate). *Commended*: Robt. Gill (Governor).

Stallions for getting Roadsters.—First prize, £10, W. H. Brown, Belton, Bawtry (Blazcaway). Second of £5, B. Balderstone, Mount Pleasant, Boston (Meryleges).

Stallions for getting Agricultural Horses.—First prize, £20, Wm. Simpkin, jun., Burton Agnes, Lowthorpe, Hull (Champion). Second of £10, T. Johnson, Hatfield, Doncaster (Young John Bull). *Commended*: S. Strickland, Headley Hall, Tadcaster (Lincolnshire).

Stallions, not less than four years old, for getting agricultural horses, and to serve mares within a radius of 15 miles round Doncaster (staying one whole day in each week in the town) during the season 1866, at a charge not exceeding 3 guineas each mare, including the groom's fee.—The prize of £50, W. Simpkin, jun. (Champion). *Highly commended*: T. Johnson (Young John Bull). *Commended*: S. Strickland (Lincolnshire).

Brood Mares for breeding Hunters, with Foals sucking.—First prize, £10, Wm. Tindall, Wheatley, Doncaster (Fanny). Second of £5, A. Macbean, The Hall, Thirsk (Miss Nightingale).

Brood Mares for breeding Coach-horses, with Foal sucking. First prize, £10, W. and F. Coulson, Gaterley Farm, Castle Howard (Venus). Second of £5, Wm. Harrison, Hutton Rudby, Yarm (Lady of the Manor).

Brood Mares for breeding Roadsters, with Foal sucking.—First prize, £7, Wm. Charlesworth, Netherton, Wakefield (Bonny). Second of £3, G. Machin, Hatfield, Doncaster (Gipsy).

Brood Mares for breeding Agricultural Horses, with Foal sucking.—First prize, £10, Wm. Tenant, Barlow, Selby (Trip). Second of £5, Wm. Tenant (Jct).

Two-year-old Hunting Geldings.—First prize, £7, T. Dawson, Ponsulds, Driffield (Boynton). Second of £3, J. Shepherd, Beechgrove House, Tadcaster.

Two-year-old Hunting Fillies.—First prize, £5, J. D. Wightman, Sutton House, Malton. Second of £2, St. J. L. Clowes, Tortworth, Bawtry.

Two-year-old Coaching Geldings.—First prize, £7, R. J. Bendley, Fimmingley Park, Bawtry. Second of £3, S. Waterhouse, High Eilers, Doncaster.

Two-year-old Coaching Fillies.—First prize, £5, J. Jackson, jun., Great Aytton, Stokesley (Cliff Lass). Second of £2, John Waller, High Leven, Yarm.

Two-year-old Agricultural Geldings or Fillies.—First prize, £7, E. Hodgkinson, Morton Grange (Heart of Oak). Second of £3, T. Turner, Armthorpe, Doncaster.

Three-year-old Hunting Geldings.—First prize, £10, W. H. Clark, Hook, Howden (Patent). Second of £5, R. Micklethwaite, Ardsley House, Barnsley (Darfield).

Three-year-old Hunting Fillies.—First prize, £7, T. B. Ireland, Tadcaster (Alice). Second, R. Sykes, Drighlington, Leeds (Gem).

Three-year-old Coaching Geldings.—First prize, £10, J. Johnson, Brigham. Second of £5, J. S. Darrell, West Ayton, Scarborough (The Ebor).

Three-year-old Coaching Fillies.—First prize, £7, C. Wood, Sparrow Hall, Salton, York (Darby). Second of £3, Messrs. W. and F. Coulson, Gaterley Farm, Castle Howard, York (Violet).

Three-years old roadsters, geldings, or fillies.—First prize, £7, Christopher Lofthouse, Tadcaster. Second of £3, J. Norton, Nortonthorpe Hall, Huddersfield (Lord Faunberger).

Three-years old agricultural geldings or fillies.—First prize, £10, Wm. Tennant, Barlow, Selby (Tom). Second of £5, C. Oxley, Hambleton, Selby (Punch).

Four-years old agricultural geldings or fillies.—First prize, £10, J. Norton, Nortonthorpe, Huddersfield (Conqueror). *No other entry.*

Four-years old hunting geldings.—First prize, £15, Jackson Everatt, Park-lane, Doncaster (Memnon). Second of £5, H. J. Percy, Howsenrigg, Aspatria, Cumberland (Ingleby).

Highly commended: R. C. Lister, Ousefleet Grange, Goole (Woolwich).

Four-years old hunting fillies.—First prize, £10, M. Kidd, Tadcaster. Second of £5, Wm. Tindall, Wheatley, Doncaster (Regalia).

Five-year-old hunters, geldings, or mares, warranted sound, and to possess not less than three crosses of blood.—First prize, £20, Henry Darley, Aldby Park, York (Camillus). Second of £5, J. Robson, Windlebeck, Ganton, York (Spring Water).

Hunters, geldings, or mares, six-years old and upwards.—First prize, £20, A. Barker, Hatfield, Doncaster (Peter). Second of £5, Sir J. V. B. Johnstone, Bart., M.P., Hackness, Scarborough (Conjuror).

Hackneys, mares, or geldings, four-years old and upwards, qualified to carry 12 stones, and not less than 14 hands high.—First prize, £20, H. J. Percy, Howsenuirg (Craity). Second of £5, G. Wakefield, Nessingham, Kirton-in-Lindsey (Pride of the Isle).

Gentlemen's cobs, any age or sex, qualified to carry 16 stones.—First prize, £10, H. J. Percy, Howsenuirg (Robin). Second of £5, B. Milward, Conisburo, Rotherham (Schim).

Ladies' hackneys, of any age or sex.—First prize, £10, W. H. Gannt, Old Thornville, York (Dandy). Second of £5, St. John L. Clowes, Torworth, Bawtry.

Ponies, from 12 to 14 hands high, any age or sex.—First prize, £10, J. W. Pease, Woodlands, Darlington (Victoria). Second of £5, R. Milward, Thurgarton Priory, Southwell, Notts (Rachel).

Best ponies, under 12 hands high, any age or sex.—First prize, £10, J. W. Richardson, Willoughton, Kirton-in-Lindsey (Uncle Tom). Second of £5, J. W. Turner, Sickling Hall, Wetherby (Bullet).

EXTRA STOCK.

First-class silver medal, A. Hind, Crowle, Bawtry (cart horse), J. Jackson, Doncaster (Depper).

DAIRY PRODUCE.

Cheese, not less than 1 cwt. in quantity, made since October 1st, 1861, the produce of one dairy.—First prize, £8, E. Temple, Saltergil Farm, Yarm. *No other entry.*

Firkins of butter.—First prize, £5; second, £2. *No entry.*

Six pounds of fresh butter, in single pounds.—First prize, £5, R. C. Workman, Alnholme, Doncaster. Second of £2, Thos. Waite, Chequer House, Doncaster. Third of £1, B. Thompson, Foulds, Tickhill, Rotherham.

WOOL.

JUDGES.—T. Clayton, Stainley Hall, Ripon.

Five hogg fleeces, long-wool.—Prize, £5, R. C. Workman, Alnholme.

Five hogg fleeces, short-wool.—Prize, £5, B. H. Brooksbank, Tickhill, Rotherham.

FLAX.

JUDGES.—R. Briggs, Leeds.

H. Lindolf, Leeds.

Specimens of mill-scutched flax. *No entry.*

Specimens of dew and cold water retted hand-scutched flax, not less than 20 stones, retted and scutched by the exhibitor.—First prize, £10, F. Moody, East Butterwick, Bawtry. Second of £5, J. Benchell, Rawcliffe Grange, Selby.

Specimens of green flax, growth of 1865, not less than 20 stones, grown by the exhibitor.—First prize, £10, J. Laverack, Keadby, Bawtry. Second of £5, J. Lofthouse, Borough-bridge.

IMPLEMENTS.

JUDGES.—T. Martin, Wainfleet, Lincoln.

W. Owen, Engineer, Rotherham.

T. Scott, Farmer, Close, Ripon.

J. Wilson, Manor House, Morpeth.

Thrashing Machines, driven by steam power, subject to thorough trials in thrashing grain and delivering it into sacks ready for market.—First prize, £50, Marshall, Sons, and Co. (limited), Gainsborough. Second of £20, Robey and Co. (limited), Lincoln. *Commended*: Ransomes and Sims, Ipswich; and Ruston, Proctor, and Co., Lincoln.

Grinding Mills, driven by horse or steam power, subject to thorough trials in crushing and grinding all descriptions of grain.—Prize of £20, Amies and Barford, Peterborough, for a Felton's American grist mill. *Commended*: H. Whiteley, Doncaster; and J. Hodgson, Duffield, Beverley.

The silver medal for the invention of any new and improved principle of construction as applied to farm implements, to Fowler and Co., Leeds, for their 8-horse power single cylinder engines, with self-moving and reversing gear.

Silver medals were also awarded to—

W. Tasker and Sons, Waterloo Iron Works, Andover, for application of chaff delivery to thrashing machines.

John Plant, Birley, Sheffield, for carti closet and commode.

Ransomes and Sims, Ipswich, for a six registered equalizing posttrees.

E. E. Allen, Westminster, for an 8-horse power patent double expansive portable steam engine.

MISCELLANEOUS.

£2, Ransomes and Sims, for Biddell's patent root pulper. £2, Ransomes and Sims, for a patent rotary adjustable self-cleaning corn screen. £2, Marshall, Sons, and Co., for application of a mill to a thrashing machine. £2, Spencer and Co., Doncaster, for a potato planting machine. £2, W. Busby, Newton, Bedale, for a plough and digger. £1, C. Topham, Birch-lane, London, for assortment of solid tube brushes for cleaning of boiler tubes. £2, W. Sawney, Beverley, for patent sack lifter and tiler. £2, R. Puckering, Beverley, for a market cart. £2, Amies and Barford, for patent turntable rollers. £2, Amies and Barford, for Patent's patent straw elevator. *Highly commended*: Patterson and Co., Beverley, for compound action mill.

FOXHOUNDS.

JUDGES.—Capt. Percy Williams, Barnby Moor, Retford.

Mr. W. H. Williamson, Whitburn, Durham.

Sir Watkin W. Wynn, Bart., Wynnistay.

Three couples of entered hounds, of either or mixed sexes, no hound being older than a seven season hunter, the silver Champion Cup, value £20, Lord Wemyss; and to W. Channing, huntsman, a gratuity of £10. Second, a silver goblet, value £10, The Earl of Yarborough; and to Nimrod Long, huntsman, a gratuity of £3. *Highly commended*: Mr. Scratton.

Unentered dog hounds, pupped since 1st December, 1863, a claret jug, value £10, Earl Fitzwilliam; and to Harry Ayris, jun., huntsman, a gratuity of £5. Second, a silver flask, value £5, Lord Hawke; and to E. Owen, huntsman, a gratuity of £2. *Highly commended*: Lord Wemyss.

Unentered bitch hounds, pupped since 1st December, 1863, pair of silver claret cups, value £10, The Earl of Yarborough; and to Nimrod Long, huntsman, a gratuity of £5. Second, silver cigar case, value £5, Mr. Harcourt Johnstone; and to his huntsman a gratuity of £2.

Stallion hounds, not less than three-season hunters, and certified to be the sires of living puppies, pair of silver claret cups, value £10, Lord Wemyss; and to W. Channing, huntsman, a gratuity of £3. *Highly commended*: Lord Yarborough.

A Silver-mounted Hunting Whip, for the huntsman who brought hounds the longest distance to the show, was awarded to W. Channing, huntsman to Lord Wemyss.

There were also Prizes for Poultry.

TRAINING THE AYRSHIRES.—The show dodges of the Ayrshire men are inexhaustible, and not unattended with danger, as one man in his last twenty-four hours of a "strong preparation" fairly burst his bull. A great deal depends upon the jockeying during that time. A cow is generally kept sharp set till four or five hours before the show. If she had been on too fine food, her paunch would be drawn up, and the vessel would lean forward, and the teats not in position; whereas if the paunch is gradually filled in these last few hours, first by giving her common food, and then by coaxing her into quantity by bettering it at every supply, she is filled to repletion, and the vessel hangs taut and square. She often gets her pound of salt at night, and between the two agencies she should be turned out quite the thing in the morning. Cows are also kept well up to "tid" during the show season with gruel made of linseed-meal, oatmeal and flour, diluted with their own milk, and sometimes as much as 3lbs. of treacle in it. The shape of the vessel is also as carefully looked to and adjusted as the Spanish cock's comb, which was, while the fashion set that way, kept up in pasteboard splints, till just before going into Bingley Hall. A board is put below the vessel with holes for the teats, and tied with strings round the cow's back, so as to keep it in position, and the vessel is laved with cold water all night, to make it flat and contracted and give it consistency. They are also washed over with butter-milk, and the finer lights put in with soap and gum. Sometimes the cow barbers use butter-milk for the legs, and take to hair-oil, and the horns are rubbed with charcoal or hawthorn ashes, in accordance with an old superstition. In short, the day and night before the show are, in many instances, quite as important as an artist's glazing-day at the Royal Academy. The judges are all well up to "the little game," which extends to seraping rams' horns almost to the quick, and then jappanning them, and is on all fours with that artistic clipping to hide weak points, against which old Val Barford, K.C.B. (Knight of the Clipping Board), struggled so long, till the Royal English Society issued its ukase.—"*Field and Fern, or Scottish Flocks and Herds,*" by *The Druid*.

THE HIGHLAND AGRICULTURAL SOCIETY.

MEETING AT INVERNESS.

The appointment of Inverness as the place of meeting, by rotation, in 1865, had a peculiar significance. It was at this pleasant "key of the Highlands," in '46, that Mr. Hall Maxwell entered on the office of Secretary; and it is here, after a most eventful nineteen years, during which the number of members has increased from 2,569 to about 4,200, that he announces his retirement. Two meetings were held at Inverness prior to that of '46, Belleville's year. In '31 the Highlanders mustered well, and the great "Corryhoyle descended from the mountain with his buck goats." In '39 the jealousy of the clans was aroused against the growing popularity of the short-horn crosses, and Mr. Wetherell stood forward, in a very hot discussion, as the champion of the "red, white, and roan." The meeting, in '56, was such a success that the Society once more settled to give up the biennial, which had been adopted since '48, and stand by an annual system. Time has worked wonders during those nine years. The mail-coachman no longer pulls up, to give his horses breath and the passengers a scenery treat, at the entrance of the Pass of Killicranckie. Aberdeen is joined by the iron road to Inverness, with a branch line to Banff; the direct Highland Railway, when lairds and "masters" do not keep the train dawdling for their sovereign will and pleasure at the stations, makes short work of the once-dreaded 100 miles; and the Sutherland men take the train South at Meikle Ferry.

The business of the show commenced at 4 a.m. on Monday, with the meeting of the judges and the committee. Mr. Hall Maxwell stated that the entries consisted of 361 cattle, 132 horses and ponies, 812 sheep, 34 swine, 11 collie dogs, a new feature, 294 head of poultry, and 707 implements, and that after careful examination by a V.S. not one of the animals, many of which, in consequence of the single train, did not arrive till Sunday, bore the slightest trace of disease. After dinner, Professor Anderson delivered a lecture on the Chemistry of Wool and its Management, and a slight discussion between the Highland and Lowland flockmasters on shearing and dipping appropriately closed the evening.

Owing to the unavoidable absence of Earl Rosslyn, the chair at the judges' early breakfast on Tuesday was taken by Earl Caithness. The morning brought with it something more than one of those Scotch mists which

"Wet the pair Scotclunan to his sark,
The Englishman to his skin,"

and the judges and their esquires had a very rough time of it. Excepting those who were specially interested in the cattle, few left their hotels, and only £151 9s. was taken at the gate in 10s. and 5s. payments. The show-yard was situated about 1½ miles from Inverness, on the farm of Seafield; but the spot was a very exposed one, and great complaints were made by owners of cattle respecting the very insufficient shedding which was put up, despite the minute specifications made by Mr. Hall Maxwell, and the appointment of a professional architect. The banquet at the Music Hall was by far the most cheerful feature of the day. The chair was taken by the Duke of Argyll, who was dressed in the Celtic costume, and wore the Order of the Thistle, and the Duke of Athole, the Earl of Caithness, and nearly 450 other noblemen and gentlemen supported him. His Grace's four years of office now expire, and it seems quite understood that he

will be succeeded by the Duke of Richmond. The speech in which his Grace proposed the Highland Society chiefly consisted of a refutation of a lecture delivered by Mr. Leone Levi, an international jurist, upon the state of the Highlands; and he also stated officially that Government intended to apply to England and Scotland the same system of statistics which had proved so reliable in Ireland. In the course of his comments on the announcement made by Mr. Hall Maxwell, his Grace observed that, "during the whole course of its existence, the Society had never had a secretary of more energy, of more zeal, and of more efficiency," and proposed a vote of thanks to him for his services. This was responded to in a manner which showed how deep and abiding is the conviction of the services Mr. Maxwell has rendered to the Society, for whose sake he gave up a very high position as an advocate.

Even in a Scottish meeting all national prejudices are broken down, and the numbers in the catalogue begin to run with the shorthorns, of which there were 87 entries. Every shorthorn has departed months since from Athelstanford. The brothers Mitchell, who were in such strength last year with Mistletoe and Blue Belle, sent nothing. Mr. Stirling's herd had not a solitary representative, and even the Brothers Cruikshank did not bring one to do battle from their 350. Still, in the old bull class, they wou by proxy with Mr. James Geddes' British King, a good roan bull, but perhaps lucky from the fact that Fosco, the second to Van Trump last year, had gone south to Doncaster. The commended bull Caractacus was also calved a few months after the dam left Sittyton. One of old "Reattie's" medal bulls, Viceroy, was second, and "Kinellar's" Prince of Worcester, the Challenge Cup bull at the Royal Northern the week before, had to be content with third honours. It was curious that in the two-year-old class, the Duke of Buccleuch's Royal Errant, Mr. Balfour's Prince Loth, and Lord Strathallan's Allan should be again in their Stirling order of merit. "The Royal" has not the masculine character of "The Prince," but the latter, who is more of a big framed steer getter, like his sire Great Seal, has rather "given" in his back, and Allan lacks scope and grandeur in his forehead. Lord Kinnaird's yearling bull Oxford Louis was better in his touch than any of them, and if Lord Strathallan could only again manage a third, his Rosa Bonheur, which had taken a third and a second before at these shows, worked up into the first place among the cows, where "Kinellar" was second, and Mr. McKessack's Lady Elma commended. In the two-year-old heifer class, Mr. Stephen, of Inchbroon, with his Emperor and Picotee blood, was second and third to "Reattie," and the combination of Prince Louis with Lord Privy Seal gave Lord Kinnaird a yearling heifer first with Princess Harriet. The Duke of Richmond was second with a daughter of Whipper-in's, one of the four first-prize Royal bulls which are stationed between John o'Groat's and Keir; and a daughter of Douglas's Hiawatha furnished a third to Mr. Geddes in a good class.

The West Highlanders, headed by the first-prize aged bull and cow at Stirling and Kelso respectively, and each of them bred by the Marquis of Breadalbane, came out 88 strong, and formed along with the Leicesters the strongest features of the show. Both the first and third aged bulls were of Breadalbane

blood, and the former of them was the Duke of Athole's famous red Donald. His Grace was also first and third with his brindled Oscar and black Gille Dubh, and first and second with his cows Mhor and Proisag Odhar; while Mr. Allan Pollok took two firsts for his black "Willie" and his dun heifer "Scanard," and Mr. Malcolm, of Pottalloor, a first and a third. Mr. Peter, another purchaser of "Breadalbanes," had also two bronze medals for his portion; but even that was no light honour, in such an array.

Mr. McCombie, who had made a great week of it at Aberdeen with the polled and the fat cups, besides other prizes, marched northward with a heavy black brigade. The fifteen-year-old Charlotte and her daughter Pride of Aberdeen were there with Daisy, for the medium gold medals; and Sir George Macpherson Grant also sent his prize Perth cow, Mayflower of Montbletton, so as to enable the Angus-men to judge what "waste is made by time," which seems to touch this race very lightly. "Tillyfour" was never in greater force. Champion of his own and President 4th of Mr. James Leslie's breeding took first bull prizes for him; Lovely and Fancy, both daughters of The Belle, stood first and second in the cow-class; and his peerless Kate of Aberdeen, winner of the polled cup at Aberdeen, was first in the two-year-old heifer, and Bloom in the yearling heifer classes. Mr. Collic, of Ardgay, had a first and second for bulls, and "Portlethen," "Shielhill," "Easter Skene," and Lord Kinaird did not go empty away. Mr. McCombie's bull success was much greater than usual, as in the only bull-class in which he did not get a first (and was in fact well beaten), one of his own breeding, Press of Aberdeen, was second. Dahaney, a Stirling first, was among the old bulls, but took nothing this journey; and Lord Southesk made no entries whatever. No Galloway bulls were shown; but as, thanks to his Grace the Duke of Buccleugh, Messrs. Graham and Cunningham had the requisite four in each of the female classes, the breed was judged separately from the Angus. Mr. Cunningham with his Kate and Diana had the best of it, the other first-prize going to the Duke for Emblem, of his Grace's favourite Knight of Lyddesdale and Precreeboer cross. Mr. Graham had no Semiramis or Harriet to confront her with this year, but he was second to Kate with two Hannibal cows.

Colly Hill of Battersea fame and Premium represented her Grace the Dowager Duchess of Athole in the gold medium medal ranks of the Ayrshires. The former, although nine years old, was giving four gallous a day in the height of the grass last year, and led everything in the Dunkeld dairy save Marion. In the cow-in-milk and in-calf classes, her Grace made eleven out of the twenty-three entries, and won all six prizes. Whitelegs and Broekie, a second at Perth in his Grace's lifetime, were eligible in each class, and headed them accordingly; and Charner and Queen of Hearts were the other Dunkeld *prima donnas*. Mr. Stewart was first in the heifer class with Dainty, which was separated from one of the Duke of Hamilton's by a heifer of Mr. Donn's, and also first in the bull class with Royal Butterfly, a name which Towneley has so tended to popularize.

Fat stock are never out of season in Scotland, and there were sixty-three entries, or eighteen more than there were in the Ayrshire classes, and fifteen less than in the combined forces of the Black and all Black. The latter had a splendid representative in the extra class in a polled ox of Mr. Harris's, bred by "Lochdu." "Tillyfour" was very sweet on this beast at the last Forres fat show, but Mr. Harris would not sell unless the black went as one of a large lot, at a price which would have seemed fabulous if Mr. Martin of Aberdeen had not given £94 10s. for a cross two-year-old steer this

spring, after a hot conflict with "Tillyfour," who had his revenge by beating it for the fat cup with a cross-bred at Aberdeen. There is no doubt that if Mr. Harris had held to his black, he would, with luck, have broken the six years' Smithfield charter, which Mr. McCombie holds for "the best Scot bullock." Flushed with his stock triumph, "Tillyfour" was determined that nothing should part them: and hence the four years and two months' specimen of ox-beef has quitted Earnhill for Tillyfour at £100! Mr. Harris, we deeply regret to say, has just had an accident with a turnip-pulper, which has deprived him of his right hand. Besides this poll, he showed a very grand shorthorn-cross ox, and took another first with him. Sir Alexander Cumming also came up strong with similar crosses, and beat the £94 10s. steer, among others. The Dunrobin Highlanders, which are said to have a title of fully two hundred years, were in their right place at the head of the Highland oxen class, with a fine home-bred black, and the brown and dun of Sir Alexander, both of which were bred by Mr. Archibald Stewart, of Dunvegan, Skye, had to yield. Curiously enough, Inverness-shire itself wound up the cattle part of the show with a quartet of Alderneys, as if to make a milk protest in the teeth of the great beef-producing northern counties.

There was a satisfactory show of horses for agricultural purposes; and Mr. Steedman, one of the Plymouth bench, was again in office. Sir A. G. Cumming's prize mare at Inverness, in '56, came, as in duty bound, for her medium gold medal, and wore well for fourteen. In the old stallion class it was rather a question of form *versus* action between the winner, Mr. Sam Clark's horse, and Mr. Muir's. One had won at the Perth Union and the other at Glasgow this year; and the Dowager Duchess of Athole was third with her Diamond. In the three-year-olds, Mr. David Riddell won with a clever "General;" but the ruck, like their seniors, was bad, and the strength of the Clydesdales centred on the two-year-old class, where Mr. Clark's winner made his mark, followed by good ones of Mr. Riddell's and Mr. Kay's, the last being the only one bred by his exhibitor. It was a hard run match for first in the yearling colts, and as Mr. Young bred Young Baronet he retired from the bench. His colleagues could not agree, and Professor Dick and another V. S. from Inverness also went into opposite lobbies. The knotty point was then referred to the breeder of Thornaby and Dundee, who was one of the stewards in attendance, and he decided in favour of Young Baronet, a horse with not quite the bone and substance, but more lifting action than his antagonist, which was bred and owned by the Duke of Hamilton.

The first prize for Clydesdale mares with foal went, after a brief consultation, to a brown mare, Jean, the property of Mr. Fleming, of Kilkerran, well-known as a successful fancier of Arabs, Ayrshires, and Gordon setters, and as the purchaser of that Athole herd of West Highlanders, which made room for the Breadalbanes. Another "Jean" was second, and the Dowager Duchess of Athole again received the bronze medal. Mr. Fleming's other brown mare came to the fore in the mare-in-foal class, but it was a much "tighter fit" with a mare of Mr. Buchanan's, which had three years more on her head. The Duke of Hamilton won the three-year-old class with his Stirling filly, beating a filly by his own Sir Walter Scott very decidedly on the point of bone. In the next two classes Mr. Fleming was third and second, in the latter case with one of his own breeding, while Mr. David Riddell and Mr. Archibald Johnston stood in the first places. The Duke of Athole beat young Mr. Hope Johnstone of The Heuk with his grey Glentilt in the pony-stallion class, and among the extras were a lot of Shetland ponies (as at Battersea) from Mr. Walker, of Maryfield House; and three thoroughbred stallions—one of them, Pulchi-

nello, from Marion, and Roebuck by General, who was commended.

The Border Leicester men pushed the strong advantage which they have gained at the Kelso and Edinburgh sales right up to the foot of the Highlands. Either the judges got puzzled, or the aged tup class was unusually level; but at all events, the judges took more than 1½ hours over it. Eventually, Mr. Ainslie, of Costerton, was placed first for a rather small but very perfect sheep, bred by Lord Polwarth, and Mr. Balfour, with one of his own breeding, and Mr. Rennie followed in order. There were fifty in the Dimmont class from nineteen exhibitors, and Mr. Purves, who sells 100 tups at Kelso each year, headed the poll with an admirable sheep. Mr. John Torrance and Simson, of Courthill, ranked next, and the former had also the reserve number. Mr. Purves made three entries, Mr. Simson four, and Mr. Torrance six. In the old ewe class, Mr. Ainslie won again, and he was also third in the gimmers, where Mr. Simson drev a-head of Mr. Purves. Lord Polwarth did not send anything. The Statherlandshire breeders showed a very poor front when Mr. Brydon flung down the wager of battle to them at their own portals. In fact, the Moodlaw tups were the only good ones shown, and after clearing everything with them, including the reserve number in one class, and taking three prizes with the only three he had in the other, the remaining reserve number went to Mr. Robert Paterson, of Bighouse, near Thurso. In the class of ewes with lambs at their foot Mr. Brydon was also first with his only entry; Sir E. E. Montgomery and Mr. Shortreed, both lowlanders, were second and third; and then came a selection from Mr. Mitchell's Ribgill's ewes—so good a flock that the ewe cast sold recently at Falkirk at 31s. 6d. "Moodlaw," however, had to lower his colours in the gimmer class; and Captain John Frazer, of Balaun, Inverness-shire, was the proud and happy man who did the deed. The blackfaces made a very grand show, as they were certain to do. Mr. Thomas Murray, of Eastside, Mr. John Archibald, of Overshiels, and Mr. Malcolm, of Pottaloch, principally rung the changes, except in the dimmonts, where "Overshiels" missed nothing but the reserve. The Duke of Richmond only showed Leicesters; and, in fact, they are gradually getting out of Southdowns at Gordon Castle; but still the old blood in Mr. Bruce's hands was strong enough to divide the Southdown honours with Mr. Scott Skirving, who has often had these classes pretty nearly his own way. Neither he nor Mr. Gibson could stand against Mr. Beale Brown, who came down, as is his annual wont, with Cotswolds, and added two more firsts for tups and ewes to his prize list. Mr. Reid was second to him in the old tup class with one which he purchased from him at Stirling last year; and Mr. Jonathan Peel showed his Lonks, some of which have been sold to cross with the blackface, and got a special recommendation for them. In Shropshires, the Glamis Trustees took the two firsts and a third, and Mr. Gibson the two seconds and a third. Brae Moray, a curious old breed of sheep "with roan face and legs, hairy wool, and as wild as a roedeer, and with lambs which are always yeaned with a yellowish-red spot on the shoulder and the tip of the tail," were also represented, and the sheep ranks were wound up by a "four-horned" tup from Lochmaddy.

There were thirty-four entries of pigs, but Mr. Findlay only took one prize for sows of the large breed. Two Berkshires were first and third in the large boar class, and in both classes for boars and sows of the small breed Mr. John Laing bore up well for the Kinross district. The lunatic asylums in the north of Scotland have always been rather famed for their good pig-feeding, but that at Elgin has enlarged its sphere, and came second with the best large boar. For the pen of large pigs under eight

months old it was a match between Rossie Priory and Hamilton Palace, and the former won with 5 months and 10 days to the good.

The new prizes for shepherds' dogs under six brought ten entries, but nine were in the dog class, where two handsome blacks were placed first and second.

Mr. Merry's only entry was made in a field of seventeen for coloured Dorkings; but a brother M.P., Mr. Dudley Marjoribanks, and also from Beauly, was more fortunate with his pens of game-fowl and Rouens. Mr. David Ainslie followed up his Leicester firsts with one for bantams; and Mrs. Ferguson Blair, the henwife *par excellence* of Scotland, did not enter or send a single bird. She has done enough for her fame without sending upwards of 100 miles for the sake of silver and bronze medals; and this is not the best time for plumage.

The show of implements was large, although 394 less than at Kelso, where the English makers had such a fine chance; and the horticultural department was very rich in seeds, samples of grasses, and plants, including several new importations of pines. The Howards, and Ransomes and Sims had large stands of implements, as had Amies and Barford. Mr. Freer, of Rothley, sent a grain dibbling machine, and Mr. J. Ireland, of Manchester, an improved churn; and a digging machine was also there, said to be the invention of one Cicero Comstock, of Milwaukie. Special trains were run in large numbers, but at the end of the second day, the receipts were only £437, or £543 behind Stirling, which had Glasgow and Edinburgh for its "feeders."

PRIZE LIST.

CATTLE.

SHORTHORNS.

JUDGES.—Thomas Hunt, Thornington, Coldstream,
Nicol Milne, of Faldonside, Melrose.
Andrew Mitchell, Alloa.

Bulls calved before 1st January, 1863.—Breeder of best Bull, Silver Medal. First prize, £20, James Geddes, Orbliston, Fochabers. Second of £10, Andrew Longmore, Rettie, Banff. Third, Bronze Medal, Silvester Campbell, Kincluar, Blackburn, Aberdeen.

Bulls calved after 1st January, 1863.—First prize, £20, Duke of Buccleuch and Queensberry, K.G., Dalkeith Park, Dalkeith. Second of £10, Arthur James Balfour, of Whittingham, Prestonkirk. Third, Bronze Medal, Viscount Strathallan, Strathallan Castle, Auchterarder.

Bulls calved after 1st January, 1864.—First prize, £10, Lord Kinnear, K.T., Rossie Priory, Inchture. Second of £5, Henry Gray, The Mains, Cashnie, Alford, Aberdeenshire. Third, Bronze Medal, Viscount Strathallan, Strathallan Castle, Auchterarder.

Cows of any age.—First prize, £15, Viscount Strathallan. Second of £5, Silvester Campbell. Third, Bronze Medal, David Ainslie, of Costerton, Blackshiels.

Heifers calved after 1st January, 1863.—First prize, £10, Andrew Longmore, Rettie, Banff. Second and third, £5 and Bronze Medal, William Stephen, Inchbroom, Elgin.

Heifers calved after 1st January, 1864.—First prize, £8, Lord Kinnear, K.T., Rossie Priory, Inchture. Second of £4, The Duke of Richmond, Gordon Castle, Fochabers. Third, James Geddes, Orbliston, Fochabers.

HIGHLAND.

JUDGES.—R. D. Campbell, of Jura.
Donald Macleod, Conmore, Inverness.
John M'Laren, Monzie, Blair Athole.

Bulls calved before 1st January, 1862.—Breeder of best bull Silver Medal.—First prize, £20, The Duke of Athole, Blair Castle, Blair Athole. Second of £10, Duncan Macpherson, Kingussie. Third, Bronze Medal, Robert Peter, Urral, Aberfeldy.

Bulls calved after 1st January, 1862.—First prize, £20, Allan Pollok, Ronachan, Clachan Cantire. Second of £10, Alexander Cameron, Campbell of Monzie, Kinloch Lodge, Fort-William. Third, Bronze Medal, John Stewart, Duatuhn, Portree.

Bulls calved after 1st January, 1863.—First prize, £10, The Duke of Athole. Second of £5, Alexander Fraser, Fallie, Inverness. Third, Bronze Medal, The Duke of Athole.

Cows of any age.—First prize, £15, The Duke of Athole.

Second of £8, The Duke of Athole. Third, Bronze Medal, John Malcolm, Poltalloch, Callton Mor, Lochgillyhead.

Heifers calved after 1st January, 1862.—First prize, £10, Allan Pollak. Second of £5, John Stewart, Dumtullm, Portree. Third, Bronze Medal, John Malcolm.

Heifers calved after 1st January, 1863.—First prize, £8, John Malcolm. Second and third, £4 and Bronze Medal, Robert Peter.

POLLED ANGUS, ABERDEEN, AND GALLOWAY.

JUDGES.—Robert Hector, Montrose.

George Milne, Haddo.
A. C. Pagan, Invergeldie, Comrie.

Bulls calved before 1st January, 1863.—Breeder of best Bull, Silver Medal. First prize, £20, William M'Combie, Tillyfour, Aberdeen. Second of £10, Robert Walker, Hillside House, Portlethen, Aberdeen. Third, Bronze Medal, Alexander Morrison, of Bogmie, Mountblairy House, Turriff.

Bulls calved after 1st January, 1863.—First prize, £20, William M'Combie. Second of £10, John Collic, Ardgay, Forres. Third, Bronze Medal, Thomas Lyall, Shielhill, Kirriemuir.

Bulls calved after 1st January, 1861.—First prize, £10, John Collic, Ardgay, Forres. Second of £5, D. R. Lyall Grant, of Kingsford, Alford, Aberdeenshire. Third, Bronze Medal, William James Taylor, Rothiemay House, Huntly.

Cows of any age.—First prize, £15, William M'Combie. Second of £8, William M'Combie. Third, Bronze Medal, Robert Walker.

Heifers calved after 1st January, 1863.—First prize, £10, William M'Combie, Tillyfour, Aberdeen. Second of £5, William M'Combie, of Easter Skene. Third, Bronze Medal, Lord Kinmaird, K.T., Rossie Priory, Incheure.

Heifers calved after 1st January, 1864.—First prize, £8, William M'Combie, Tillyfour, Aberdeen. Second of £4, Robert Walker, Mounbletton, Banff. Third, Bronze Medal, John Collic, Ardgay, Forres.

AYRSHIRE.

JUDGES.—John Baird, of Ury, Stonehaven.

Peter Drew, Carnyale, Tolleross, Glasgow.
Duncan Macfarlane, Torr, Helensburgh.

Bulls calved after 1st January, 1862.—Breeder of best Bull, Silver Medal. First prize, £20, John Stewart, Burnside Cottage, Strathaven. Second of £10, Robert Wilson, Nether Johnstone, Kilbarclan. Third prize withheld.

Cows in-Milk, of any age.—First prize, £10, second of £5, and third, Bronze Medal, The Dowager Duchess, of Athole, Dunkeld.

Cows in-Calf, of any age.—First prize, £10, second of £5, and third, Bronze Medal, The Dowager Duchess of Athole.

Heifers calved after 1st January, 1863.—First prize, £10, John Stewart. Second of £5, William Dunn, of Dalmarie, Tarbolton. Third, Bronze Medal, The Duke of Hamilton.

FAT STOCK.

JUDGES.—John Dudgeon, Almondhill, Kirkliston.

Thomas Middleton, Davidson, Cromarty.
J. Stewart Menzies, of Chesthill, Aberfeldy.

Oxen of any Pure or Cross Breed, calved after 1st January, 1862.—First prize, £8, Richard Heath Harris, Earnhill, Forres. Second of £4, Walter Scott, Glendrouach, Huntly.

Oxen of any Pure or Cross Breed, calved after 1st January, 1863.—First prize, £6, second £3, Sir Alexander P. Gordon Cumming, of Alyre, Bart., Forres. Third, Bronze Medal, J. and W. Martin, Aberdeen.

Oxen of any Pure or Cross Breed, calved after 1st January, 1864.—First prize, £4, Sir Alexander P. Gordon Cumming, of Alyre, Bart. Second, of £2, David Ainslie, of Costerton, Blackshields. Third, Bronze Medal, John Ferguson, East Grange, Forres.

Highland Oxen calved after 1st January, 1861.—First prize, £5, James Gordon, of Manar, Keith-Hall. Second of £4, Andrew Longmore, Rettie, Banff. Third, Bronze Medal, Archibald Stewart, Claigin, Dumvegan, Skye.

Highland Oxen calved after 1st January, 1862.—First prize, £6, The Duke of Sutherland, K.G., Durnrobin Castle, Golspie. Second of £3, and third, Bronze Medal, Sir Alexander P. Gordon Cumming, of Alyre, Bart.

Cross Heifers, calved after 1st January, 1863.—First prize, £6, Henry A. Rannie, Mill of Boyndie, Banff. Second of £3, Edward Tew, Coul Cottage, Aines. Third, Bronze Medal, Sir Alexander P. Gordon Cumming, of Alyre, Bart.

Cross Heifers calved after 1st January, 1864.—No award.

HORSES.

FOR AGRICULTURAL PURPOSES.

JUDGES.—James Salmon, Benston, Paisley.
James Steedman, Boghall, Roslin.
Alexander Young, Keir Mains, Dumblane.

Stallions foaled before 1st January, 1862.—First prize, £30, Samuel Clark, Manswrae, Kilbarclan. Second of £15, James Muir, Hardington Mains, Wiston, Biggar. Third, Bronze Medal, The Dowager Duchess of Athole, Dunkeld. Breeder of best Stallion, Silver Medal.

Entire Colts foaled after 1st January, 1862.—First prize, £20, David Riddell, Kilbowie, Dumtocher. Second of £10, Andrew Wilson, Whiteside, Alford. Third, Bronze Medal, William Murray, Kileoy, Redcastle, Killearnan, Inverness.

Entire Colts foaled after 1st January, 1863.—First prize, £15, Samuel Clark. Second of £8, David Riddell. Third, Bronze Medal, James Kay, Hill Farm, Garguonock.

Entire Colts foaled after 1st January, 1864.—First prize, £10, Robert M'Keen, Lunloch, Bishopbriggs. Second of £5, The Duke of Hamilton and Brandon, Hamilton Palace, Hamilton.

Mares (with Foal at foot) foaled before 1st January, 1862.—First prize, £20, Peter Beattie, Insch, Aberdeenshire. Second of £10, John Hendrie, Castle Leathers, Inverness. Third, Bronze Medal, The Dowager Duchess of Athole, Dunkeld.

Mares (in Foal) foaled before 1st January, 1862.—First prize, £15, J. N. Fleming, Kilkerran House, Maybole. Second of £8, Alexander Buchanan, Garscadden Mains, New Kilpatrick.

Fillies foaled after 1st January, 1862.—First prize, £10, The Duke of Hamilton and Brandon. Second of £5, Alexander Murdoch, Hilton, Bishopbriggs. Third, Bronze Medal, Alexander Stewart, Bog of Cawdor, Nairn.

Fillies foaled after 1st January, 1863.—First prize, £8, David Riddell. Second of £4, Alexander Buchanan. Third, Bronze Medal, J. N. Fleming.

Fillies foaled after 1st January, 1864.—First prize, £6, Archibald Johnston, Lochburn, Maryhill, Glasgow. Second of £3, J. N. Fleming. Third, Bronze Medal, Hugh A. Gair, Hilton, Inverness.

PONIES.

JUDGES.—Sir Alexander P. Gordon Cumming, of Alyre, Bart.
Major Horne, of Strikock, Wick.

Pony Stallions, not exceeding 14 hands.—First prize, £10, The Duke of Athole, Blair Castle, Blair-Athole. Second of £5, Charles Hope Johnston, the Hewk, Lockerbie. Third, Bronze Medal, Donald MacLeod, Coummore, Inverness.

Pony Mares, not exceeding 14 hands.—First prize, £8, John Baillie Baillie, of Leys, Inverness. Second of £4, Fountaine Walker, of Foyers, Muirton, Inverness. Third, Bronze Medal, Hugh Mackenzie, of Dundonnell, Ullapool.

SHEEP.

LEICESTER.

JUDGES.—Joseph Bell, Scalehill, Lazony, Penrith.
Peter Reid, Drumfouk House, Helensburgh.
John Wilson, Edington Mains, Chirnside.

Tups not above Four Shear.—First prize, £10, David Ainslie, of Costerton, Blackshields. Second of £5, Arthur James Ballour, of Wittingham, Prestonkirk. Third, Bronze Medal, Henry A. Rannie, Mill of Boyndie, Banff.

Dinnont or Shearling Tups.—First prize, £10, William Purves, Linton Burnfoot, Kelso. Second of £5, George Torrance, Sisterpath, Dunse. Third, Bronze Medal, George Simson, Courthill, Kelso.

Ewes not above Four Shear.—First prize, £8, David Ainslie. Second of £4, John Garland, Cairnton, Fordoun. Third, Bronze Medal, Thomas Ferguson, Kinnochry, Compar-Angts.

Shearling Ewes or Gimmers.—First prize, £8, George Simson. Second of £4, William Purves. Third, Bronze Medal, David Ainslie.

CHEVIOT.

JUDGES.—William Aitchison, Linhope, Hawick.
Mr. William Purves, Linton, Burnfoot.
Alexander Denholm, Baillaws, Biggar.

Tups not above Four Shear.—First prize, £10, James Brydon, Moodlaw, Langholm. Second of £5, James Brydon, jun., Kinnelhead, Moffat. Third, Bronze Medal, James Brydon, Moodlaw, Langholm.

Dinnont or Shearling Tups.—First prize, £10, Second of £5, Third, Bronze Medal, James Brydon, jun.

Ewes not above Four Shear, with Lambs at Foot.—First prize, £8, James Brydon. Second of £4, Sir G. Graham Montgomery, of Stanhope, Bart., M.P., Stobo Castle, Peebles. Third, Bronze Medal, Robert Shorrocd, Attonburn, Kelso.

Shearling Ewes or Gimmers.—First prize, £8, Sir Graham Montgomery, of Stanhope, Bart., M.P. Second of £4, James Brydon, Third, Bronze Medal, John Archibald, Glengelt, Lander.

BLACKFACED.

JUDGES.—Alexander Denholm, Baillaws, Biggar.
John M'Laren, Monzie, Blair-Athole.

Tups not above Four Shear.—First prize, £10, Thomas Murray, Eastside, Penicuik. Second of £5, John Archibald, Overshields, Stow. Third, Bronze Medal, Allan Cunningham Pagan, Invergeldie, Comrie, Crieff.

Dinnont or Shearling Tups.—First prize, £10, Second of £5, Third, Bronze Medal, John Archibald.

Ewes not above Four Shear, with Lambs at Foot.—First

prize, £8, John Malcolm, of Pottaloe, Callton Mor, Lochgilhead. Second of £4, Allan Cunningham Pagan. Third, Bronze Medal, James M'Pherson, Drumore, Ardesier. Best Pen of Lambs, Silver Medal.

Shearing Ewes or Gimmers.—First prize, £8, Thomas Murray, Easide, Penicuik. Second of £4, John Archibald. Third, Bronze Medal, John Malcolm.

SOUTH DOWNS.

JUDGES.—Robert Elliot, Laighwood, Dunkeld.
William Goodlet, Bolshaw, Arbrough.

Tups not above Four Shear.—First prize, £10, James Bruce, Burnside, Fochabers. Second of £5, D. R. Williamson, of Lawers, Crieff. Third, Bronze Medal, Robert Scott Skirving, Camptoun, Drem.

Ewes not above Four Shear, or Gimmers.—First prize, £8, Robert Scot Skirving. Second of £4, Jas. Bruce. Third, Bronze Medal, Robert Scot Skirving.

LONG-WOOLLED OTHER THAN LEICESTER.

JUDGES as for Leicesters.

Tups not above Four Shear.—First prize, £10, Thomas Beale Brown, of Salperton Park, Andoversford, Gloucestershire. Second of £10, Walter Reid, Drem. Third, Bronze Medal, Thomas Beale Brown.

Ewes not above Four Shear, or Gimmers.—First prize, £8, Thomas Beale Browne. Second of £4, John Gibson, Woolmet, Dalkeith. Third, Bronze Medal, Robert Scot Skirving, Camptoun, Drem.

SHORT-WOOLLED OTHER THAN SOUTHDOWN.

JUDGES as for Southdowns.

Tups not above Four Shear.—First prize, £10, Andrew Ralston, for the Glamis Trustees, Glamis House, Glamis. Second of £5, and Third, Bronze Medal, John Gibson, Woolmet, Dalkeith.

Ewes not above Four Shear, or Gimmers.—First prize, £8, Andrew Ralston, for the Glamis Trustees. Second of £4, John Gibson. Third, Bronze Medal, Andrew Ralston, for the Glamis Trustees.

CROSS.

Shearing Wethers of any Cross.—First prize, £6, John Hunter, Dipple, Fochabers. Second of £3, Alexander Ronald, son, Little Gight, Methlic. Third, Bronze Medal, Sir Alexander P. Gordon Cumming, of Artyre, Bart., Forres.

Lambs of any Cross.—First prize, £4, A. and A. Cowan, 5, Bridge-street, Inverness. Second of £2, Edward Tew, Coul Cottage, Almess. Third, Bronze Medal, John Ferguson, East Grange, Forres.

S W I N E.

JUDGES.—Thomas Beagle, Queenston Bank, Drem.
David Muddell, Auchindrean, Lochbroom.
Robert Anderson, of Lochdhu, Nairn.

Boars, large breed.—First prize, £8, Andrew Ralston, for the Glamis Trustees, Glamis House, Glamis. Second of £4, James Reid, Lunatic Asylum, Elgin. Third, Bronze Medal, Donald Cameron, of Lochiel, Achnacarry Castle, Port-William.

Boars, small breed.—First prize, £8, John Laing, Glenduzlie, Milnathort, Kinross. Second of £4, William Steven, Inchbroom, Elgin. Third, Bronze Medal, Colonel William Fraser Tytler, of Aldourie, Inverness.

Sows, large breed.—First prize, £6, Thomas D. Findlay, Easterhill, Glasgow. Second of £3, Captain A. M. Clarke, Mediat, Parkhill, Inverness. Third, Bronze Medal, The Duke of Hamilton and Brandon, Hamilton Palace, Hamilton.

Sows, small breed.—First prize, £6, John Laing. Second of £3, Alexander Simpson, Seafield, Inverness.

Pens of three Pigs, not exceeding eight months old (large breed).—First prize, £4, The Duke of Hamilton and Brandon, Hamilton. Second of £2, Lord Kinnaird, K.T., Rossie Priory, Inchture.

THE DURHAM AGRICULTURAL SOCIETY.

MEETING AT DURHAM.

The twenty-third annual show of the Durham County Agricultural Society was held on Aug. 5th; while the last show of the society, forming the twenty-second, was held at Gateshead two years since, no show taking place last year, in consequence of the meeting of the Royal Agricultural Society at Newcastle. Everything considered—keeping in view the many excellent meetings the society has had, and the fact that a larger number of entries were looked for in some of the classes—this meeting can scarcely be described as being superior to those which have preceded it.

In point of numbers, the shorthorns made a poor show; but so far as quality is concerned, a better display could scarcely have been desired. Every animal might, with credit to its owner, have taken a prize; and, indeed, the majority had already taken honours at previous exhibitions. Chief amongst these was the celebrated roan cow Corinne, the property of Mr. John Wood, Stanwick Park, Darlington. This animal took first prize at the Royal show at Plymouth this year: and, of course, she did not fail to secure the first prize at Durham. There were seven entries in class one, for the best bull of any age. Two prizes were given, the first of which was awarded to Mr. T. C. Booth's Prince Charlie, and the second to Mr. W. Lambert's Pizarro; but so excellent were the whole seven animals that the judges, after a somewhat lengthened consultation, resolved that the whole class should be commended. The other animals were Surly, belonging to Mr. John Newton, Hexham; Royal Buttridly 16th, belonging to Messrs. Stephenson and Coulson, Hexham; Earl of Derby, belonging to Mr. Samuel Wiley, Brandsby, Yorkshire; Bywell Victor, belonging to George Atkinson, Seaham Hall Farm; and Lord Pam, the property of Mr. J. R. Middlebrough, South Milford, Yorkshire. Another Plymouth prize winner competed in class 4, and gained the first prize as the best two-year-old heifer in calf—namely, Mr. C. T. Booth's Lady Fragrant, which also took honours at the late show at Doncaster, and at the Peterboro' show. Mr. T. Jolly's Empress of the Isles, which has been successful in nearly every show at which she has been exhibited, took the first prize in the one-year-old heifer. The second prize in the class for heifer-calves was awarded to Mr. M. Stephenson's Miss Beverley 17th, which headed the list at Hexham the

preceding day; while the first prize was given to Miss Beverley 18th, the property of the same gentleman, which, strangely enough, came off second best at Hexham. In the shorthorn section, a piece of plate of the value of one hundred guineas is given annually by the society, and competed for on the conditions mentioned in the prize-list. This cup was won in 1860, at Bishop Auckland, by Captain Gunter's Duchess 77th; at Darlington, in 1861, by Mr. Richard Booth's Sailor Bride; at Sedgfield, in 1862, by Mr. Booth's Queen of the Ocean; and at Gateshead, in 1863, by Lady Pigot's Rosedale. This year it has been won by Mr. T. C. Booth's Lady Fragrant. A piece of plate of the value of twenty-five guineas is given as a second prize, and competed for on similar conditions. The prize was won in 1860, at Bishop Auckland, by Mr. Jeffrey Bulmer's Earl of Derby the 2nd; at Darlington, in 1861, by Mr. Jeffrey Bulmer's Princess Royal 2nd; at Sedgfield, in 1862, by Mr. G. Atkinson's white heifer, Snowdrop; and at Gateshead, in 1863, by Mr. G. Atkinson's Ringlet. This year it has been won by Mr. J. W. Botcherby's White Cherry, calved 21st July, 1863, and which competed unsuccessfully in class 4.

The show of horses was in every respect an excellent one—by far the most important the society has had for some time, the entries in every class being at once numerous and good. Mr. Joseph Webster took the prize of £20 for his blood stallion, Strathern; while the first prize for cart stallions was gained by Mr. Matthew Reed, Beamish Burn, for England's Glory. The first prize for three-year-old colts for the field was given to Buffon, the property of Mr. J. B. Booth, Killyerly, an animal which took the first prize at Darlington and Guisborough. Previous prize winners in fact were very numerous, it being no uncommon circumstance to come upon two or three in each class. Among the more important of these which also took prizes yesterday were a two-year-old bay filly, belonging to Mr. J. W. Pease, Darlington; the yearling colt, Bird of Passage, belonging to Mr. J. B. Booth; and a yearling cart filly, belonging to Mr. Wm. Dickman, Fence Houses.

A number of animals were exhibited as extra stock. Among these were several fine ponies and horses, an Alderney bull, one pair of Brittany, one pair of Alderney, and one pair of Hereford cows, one Kerry cow, and a pen of Shropshire lambs.

In the same class two beautiful Newfoundland dogs and one or two pairs of golden and silver pheasants were also exhibited. The extra stock proved a great attraction to visitors. No prizes were given, but several of the animals were marked highly commended.

The show of pigs and poultry was an exceedingly good one, but of sheep the display was very short in numbers. The quality of the latter, however, was fully up to the average, and the prizes were gained by really fine specimens of the Leicester breed.

There were eleven stands of implements upon the ground, and, in accordance with an arrangement come to, the implement committee were empowered to award prizes to any agricultural implement on a new and improved principle of construction, and combining efficiency, simplicity, and economy, which may be recommended by the judges, provided the amount does not exceed £5. The exhibitors were Mr. J. Weighill, Albert Foundry, Pickering; Mr. T. E. Colgrave, Newcastle-upon-Tyne; Mr. John Richardson, Carlisle; Mr. N. Willis, Hutton-le-Hole; Mr. John Bamlet, West Sherburn; Mr. J. Malcolm, Durham; Messrs. C. Scott and Son, Felton; Mr. W. Bushby, Newton; Mr. John Boyd, Durham; Mr. John Dickinson, Durham, &c. Prizes of 10s. each were awarded—1st, for an ellipse one horse-power reaping machine, with two knives, price £17 18s. 6d.; 2nd, for an oilcake breaker, price £1 1s. 6d.; 3rd, for an oat and bean crusher; and 4th, for a sheep rack. A prize of £1 was given to Mr. Richardson, Carlisle, for a winnowing machine exhibited by him, price £7 10s. A prize of £1 each was given for the following articles exhibited by Mr. Gregory:—1st, a Wood's patent grass mower, which received the first prize at the Royal Agricultural Society's show at Plymouth; 2nd, a Wood's patent drop board reaper, which also received a first prize at Plymouth; 3rd, a Bamlet's patent combined reaper and mower. A prize of £2 was given to Mr. Willis for a reaping machine and a horse hay-rake with steel teeth; a prize of 10s. to Mr. Bamlet, for a double mould-board plough; a prize of £1 to Mr. Bushey, for a reaping machine and a plough and digger; and £1 to Mr. Boyd, for a stand of ironmongery.

The judges were: For cattle, sheep, and pigs—Mr. Raine, Morton, Timmouth; Mr. Dent; Archdeacon Newton; and Mr. Scott, Broom Close. For horses—Mr. Turnbull, Under Lee; Mr. Wilkinson, Witonstall; Mr. Hodgson, Bramper; Mr. J. Wood, Stanwick Park; Mr. J. Furness, Coxhoe; and Mr. Bolam. For implements and poultry—The Committee.

The annual dinner took place in the Durham Town Hall in the evening, under the presidency of the chairman of the society, Sir Hedworth Williamson, Bart., M.P., and there was a large attendance.

PRIZE LIST.

CATTLE.

SHORTHORNS.

A piece of plate, of the value of 100 guineas, to the owner of the best Shorthorn breeding animal (of either sex) exhibited, and to become the absolute property of the person who shall win it three years in succession.—T. C. Booth (Lady Fragrant).

A piece of plate of the value of 25 guineas.—J. W. Botcherby (White Cherry).

Bulls of any age.—First prize, 20*l.*, T. C. Booth, Warlaby, Northallerton (Prince Alfred). Second of 5*l.*, W. Lambert, Ellington Hall (Pizarro).

Bulls under two years old.—Second prize, 5*l.*, T. C. Booth, Warlaby, Northallerton (Commander-in-chief).—*No competition.*

Cows, in-calf or milk, having had a calf within the last twelve months.—First prize, 10*l.*, J. Wood, Stanwick Park, Darlington (Corinne). Second of 5*l.*, W. Lambert (Queen of Beauty).

Two-year-old Heifers, in-calf.—First prize, 6*l.*, T. C. Booth (Lady Fragrant). Second of 3*l.*, J. Wood (Clotilde).

One-year-old Heifers.—First prize, 4*l.*, T. Jolly, Warlaby, Northallerton (Empress of the Isles). Second of 2*l.*, G. Atkinson, Seaham Hall Farm (Julia 2nd).

Bull-calves under twelve months old.—First prize, 3*l.*, T. C. Booth, Warlaby, Northallerton (Prince Christian). Second of 1*l.*, W. Coxon, Plawsworth, Durham (Ariel).

Heifer-calves under twelve months old.—First prize, 3*l.*, M. Stephenson, Fourstones, Hexham (Miss Beverley 18th). Second of 1*l.*, M. Stephenson (Miss Beverley 17th).

LEICESTER OR LONG-WOOLLED SHEEP.

Rams of any age.—Prize, 5*l.*, J. Simpson, Spofforth Park, Wetherby.—*Two entries.*

Shearling Rams.—Prize of 5*l.*, J. Simpson.

Pens of five Ewes having reared lambs this year.—Prize of 3*l.*, J. Simpson.

Pens of five Shearling Gimmers.—Prize of 3*l.*, J. Simpson.

PIGS.

Boars, large breed.—Prize of 3*l.*, R. Duckering, Northorpe, Kirton Lindsey.

Boars, small breed.—Prize of 3*l.*, George Mangles, Givendale, Ripon.

Sows, large breed.—Prize of 2*l.*, R. Duckering.

Sows, small breed.—Prize of 2*l.*, G. Mangles.

HORSES.

Blood Stallions.—Prize of 20*l.*, J. Webster, Allerstone, Pickering (Strathern).

Cart Stallions.—Prize of 20*l.*, M. Reed, Beamish Burn, Chester-le-Street (England's Glory).

Brood Mares, for saddle.—Prize of 5*l.*, J. W. Pease, Darlington.

Harness Mares.—Prize of 5*l.*, W. and F. Coulson, Gaterley Farm, Castle Howard (Venus).

Cart Mares.—Prize of 5*l.*, J. M. Pattison, Norwood.

Sweepstakes of 5s. each, with 2*l.* added, for Foals for the saddle.—J. W. Peas, Darlington.

Sweepstakes of 5s. each, with 2*l.* added, for Foals for harness.—W. and F. Coulson, Gaterley Farm, Castle Howard, York (Vesta).

Sweepstakes of 5s. each, with 2*l.* added, for Cart Foals.—George Hobson, Harperly Mills.

Three-year-old Colts for the field.—Prize of 5*l.*, J. B. Booth, Killyer, Catterick (Buffon).

Three-year-old Fillies for the field.—Prize of 5*l.*, J. Atkinson, Low Beaumont Hill.

Three-year-old Colts for harness.—Prize of 5*l.*, George Robinson, Marton, Middlesbro'.

Three-year-old Fillies for harness.—Prize of 5*l.*, W. and F. Coulson (Violet).

Three-year-old Cart Colts.—Prize of 5*l.*, Robert Hird, Brierton.

Three-year-old Cart Fillies.—Prize of 5*l.*, John Crawford, Lamley.

Two-year-old Colts for the field.—Prize of 4*l.*, J. B. Booth, Killyer.

Two-year-old Colts for harness.—Prize of 4*l.*, C. L. Wood, Howlish Hall.

Two-year-old Fillies for harness.—Prize of 4*l.*, John Jackson, jun., Cliff House, Great Ayton, Northallerton.

Two-year-old Cart Colts.—Prize of 4*l.*, F. Potts, Ovington, Northumberland.

Two-year-old Cart Fillies.—Prize of 4*l.*, J. W. Pease, Woodlands.

Yearling Colts for the field.—Prize of 3*l.*, J. B. Booth.

Yearling Fillies for the field.—Prize of 3*l.*, J. Walton, Acklam, Middlesbro'.

Yearling Colts for harness.—Prize of 3*l.*, C. L. Wood.

Yearling Fillies for harness.—Prize of 3*l.*, J. Jackson, jun.

Yearling Cart Colts.—Prize of 3*l.*, Forster Potts, Ovington, Northumberland.

Yearling Cart Fillies.—Prize of 3*l.*, William Dickman, Lamley, Fence Houses.

Mares or Geldings not more than eight years of age, qualified to carry 12 stones with hounds, and warranted sound at the time of entry.—George H. Burnett, Blaydon-upon-Tyne (Verdant Green).

Roadsters, Mares, or Geldings not more than eight years old.—Prize of 10*l.*, George Mulcaster, Housecraig, Aspatria, Cumberland (mare—Crafty).

EXTRA STOCK.

Highly commended: H. J. Baker, Esq., Elemore Hall (black mare Exmoor pony); H. Marshall, Sands House (horse pony); H. K. Webster, Morton House (pony); John Holt, Skinner-street, Stockton (pony by 'The Cure'); E. and N. Richardson, Sunderland (draught horse—Buck).

Cows.—Highly commended: H. Marshall, Sands House, Durham (pair of Brittany cows and pair of Alderney cows); Viscount Boyne, Bracepeth Castle (pair of Hereford cows).

Sheep.—Highly commended: Viscount Boyne, Bracepeth Castle (pen of Shropshire lambs).

NORTH LANCASHIRE AGRICULTURAL SOCIETY.

MEETING AT ACCRINGTON.

This show was held on August 13th, when the attendance of visitors was numerous, considering the weather, which was threatening throughout the day. As a whole, the meeting proved inadequate to the expectations of the Council. Compared with previous years, the entries were not so large; and among the Shorthorns, a number of persons who had entered failed to exhibit. The cause of absence is probably attributable to several local shows being held within a comparatively few days of each other. Implements were also more select than numerous. They included a few new features in chaff cutters, root cutters, and pulpers. The judges were—Implements: Messrs. Roberts, Boulton, and Addie. Cattle: Messrs. Tallant, Dodds, and Patterson. Horses: Messrs. Bromley, Morphett, and Brewer. Sheep and pigs: Messrs. Jefferson, Bradbury, and Baxter. Butter, cheese, roots, and seeds: Messrs. Walker, Melling, Logan, and Cartmell. Poultry: Messrs. Hindson and Foulds.

The following are the principal prizes:

IMPLEMENTS.—Best mowing machine, Society's silver medal and £10, Kearsley, Ironworks, Ripon. Second best, Society's silver medal and £5, Richmond and Chandler, Salford. Best collection of agricultural implements, £10, Pickersley, Sims, and Co., Leigh, Lancashire. Second best, £5, Richmond and Chandler.

CATTLE.—Shorthorns: Bulls two years old or upwards, Society's medal and £10, J. Taylor, Moreton, Whalley. The class commended. Bull above one and under two years, Society's silver medal and £10, F. H. Fawkes, Otley. Bull calf under twelve months, Society's silver medal and £3, Dugdale and Sons, Mytton Bridge, Whalley. Cow or heifer above three years old, and in calf or milk, £5, A. Dugdale, Rose Hill, Burnley. Heifer above two and not exceeding three years, £5, Lady Pigot, Branches Park, Newmarket. Heifer not exceeding two years, £3, Lady Pigot. Heifer calf, £2, B. Baxter, Elslack Hall, Skipton. Cattle of any breed: Bull two years and upwards, Society's silver medal and £10, W. Boulton, Park House, Dalton-in-Furness. Bull above one and under two years, Society's silver medal and £10, F. Leach, Brangerley, Clitheroe. Bull calf under twelve months, £3, Dugdale and Sons. Cow in calf or milk, having had a calf, and above three years, £5, C. W. Brierley, Rhodes House, Middleton. Three dairy cows, £5, L. C. Wood, Singleton Lodge, Kirkham. Heifer not exceeding three years, and in calf or milk, £5, M. Noble, Great Harwood, Accrington. Three heifers two years old and not exceeding three, £5, J. Woodhouse, Seale Hall, Skerton. Heifer not exceeding two years, £3, R. C. Richards, Clifton Lodge, Preston. Three heifers one year old and not exceeding two, bred by exhibitor, £5, R. C. Richards. Heifer calf, £2, Baxter. Three heifer calves not exceeding one year, bred by exhibitor, £5, B. Baxter. Extra stock: C. W. Brierley. Cup, value 20 guineas, for the best bull, any age: F. H. Fawkes, Otley. Cup, value 20 guineas, for the best female animal, any age: A. Dugdale.

HORSES.—Stallion for waggon or dray purposes, Society's silver medal and £10, R. J. Robinson, Broughton, Manchester. Stallion for agricultural purposes, Society's silver medal and £10, J. Wallworth, Clifton, Manchester. Thorough-bred stallion, Society's silver medal and £20, J. M. Grainger, White-well, Clitheroe. Roadster stallion, not thorough-bred, Society's silver medal and £10, G. A. Jackson, Bradford. Brood mare for agricultural purposes, being in-foal, or having produced a foal in 1865, £5, J. Campbell, Hollins, Padilham. Mare for breeding hunters, being in-foal, or having produced a foal in 1865, £5, Mr. F. Steiner, Hyndburn, Accrington. Brood mare for harness purposes, being in-foal, or having produced a foal in 1865, £5, J. Peel, Knowlmore Manor, Clitheroe. Pair of horses employed solely in agricultural pursuits, above three years old, £5, R. Eastwood, Thorneyholme, Clitheroe. Pair of draught horses, above three years old, £5, J. Green, Preston. Three-year-old gelding or filly for agricultural purposes, £3, T.

Cooper, Stoneyhurst, Whalley. Three-year-old gelding or filly for hunting purposes, £3, J. Peel. Three-year-old gelding or filly for harness purposes, £3, C. J. Stonor, Chorley. Two-year-old gelding or filly for agricultural purposes, £2, T. Cooper. Two-year-old gelding or filly for hunting purposes, £2, J. Peel. Two-year-old gelding or filly for harness purposes, £2, S. Longworth, Whalley. Yearling colt or filly for agricultural purposes, £2, T. Cooper. Yearling colt or filly for hunting purposes, £2, A. W. Eastwood, Brindle Lodge. Yearling colt or filly for harness purposes, £2, A. W. Eastwood. Colt or filly foal for agricultural purposes, £2, J. Openshaw, Hothersall Hall, Bury. Colt or filly foal for hunting purposes, £2, T. Statter, Stand Hall, Whitefield, Manchester. Colt or filly foal for harness purposes, £2, R. Walker, Thistleton, Kirkham. Hunter, four years old and upwards, and to leap, at the discretion of the judges, three heights of hurdles 4 ft. 6 in. high, £10, G. McCulloch, Ellesmere House, Pemberton, Wigan. Cob, above 13 and not exceeding 14½ hands high, £3, Dr. Hartley, Fern House, Accrington. Pony, not exceeding 13 hands high, £2, W. Hesketh, jun., Accrington. Cup, value 20 guineas, for the best thorough-bred stallion, J. M. Grainger. Cup, value 20 guineas, for the best stallion for agricultural purposes, J. Wallwork. Cup, value 10 guineas, for the best brood mare for hunting purposes, F. Steiner. Cup, value 10 guineas, for the best brood mare for agricultural purposes, J. Campbell, Padilham.

SHEEP.—Shearling Leicester, £3; J. Simpson, Spofforth Park, Wetherby. Rams of the Leicester breed, of any other age, £2; J. Simpson. Ram of the Southdown breed, of any other age, £3, T. Statter, Strand, Whitefield, Bury. Shearling ram of the Shropshire Down breed, £3, D. R. Davies, Mere Old Hall, Knutsford, Cheshire. Ram of the Shropshire Down breed of any other age, £3, D. R. Davies. Shearling ram of the Lonk breed, £3, J. Peel. Ram of the Lonk breed of any other age, £2, J. Peel. Ram of any other breed adapted to a mountain district, £2, G. Browne, Troutbeck, Windermere. Pen of five Lonk ram lambs, £2, R. Westall, Lower Moor, Accrington. Pen of five Leicester ewes, each having reared a lamb in 1865, £2, G. Browne. Pen of five shearling Leicester ewes, £2, J. Woodhouse, Seale Hall, Skerton. Pen of five Shropshire Down ewes, each having reared a lamb in 1865, £2, D. R. Davies. Pen of five shearling Shropshire Down ewes, £2, D. R. Davies. Pen of five Lonk ewes, each having reared a lamb in 1865, £2, J. Peel. Pen of five shearling Lonk ewes, £2, J. Peel. Pen of five ewes of any other breed, each having reared a lamb in 1865, and best adapted to a mountain district, £2, G. Browne. Pen of five Lonk gimmer lambs, £1, T. Birtwistle, Oak Tree Inn, Accrington. Lonk ram lamb, £1, J. Peel.

PIGS.—Boar of the large breed of any age, £3, R. Dickin, Old Road, Stockport. Boar of the small breed of any age, £3, R. Dickin. Breeding sow of the large breed, in pig or milk, £2, W. Gaman, The Green, Thornton-le-Moors, Chester. Breeding sow of the small breed, in pig or milk, £2, D. Henderson, Accrington.

ROOTS AND SEEDS.—Collection of roots and vegetables, not less than six distinct varieties, £1, J. Smith, Whittle Woods, Chorley. Six roots of swedish turnips, 10s., E. Turner, Hopwood, Heywood. Six roots of any other kind of turnips, 10s., R. Thompson, Mythop, Kirkham. Six roots of long red mangal wurzel, 10s., T. Lazenby, Leyland, Preston. Six Scotch cabbages, 10s., J. Smith. Twenty potatoes of any kind, 10s., R. Thompson. Sample of round seedling potatoes, £1, T. Crook, Leyland Lane, Preston. Sample of kidney seedling potatoes, £1, T. Crook. Twelve carrots of any variety, 10s., R. Dunderdale, Nately, Garstang.

BUTTER AND CHEESE.—Basket of butter, not less than 10lb., £2, G. Haworth, Lower Darwen. Dairy of cheese, consisting of not less than 1 cwt., £3, J. and J. Porter, Hodder Bank, Whitewell.

THE DUKE OF ARGYLL ON HIGHLAND AGRICULTURE.

At the banquet which attended the proceedings of the Highland and Agricultural Society's show at Inverness, the Duke of Argyll, president of the society, in proposing "Prosperity to the Great Highland and Agricultural Society of Scotland," said: In going over the showyard to-day I could not help contrasting the picture which the show presented to me, in the improvement which has taken place in the Highland counties of Scotland, with another picture which I have recently seen drawn in London with reference to the condition of these counties. Gentlemen, about six weeks ago, towards the end of the month of June, I received a very civil note from a gentleman who may be well known by name to some of you—a gentleman of great eminence connected with the social and economic sciences of London, a foreigner and a Jew by birth—Professor L. Levi, a very distinguished man, who wrote to me that he was about to read a paper upon the agricultural and social condition of the Highlands of Scotland before a statistical society of London, and asking me if I would come to hear the paper. Now, gentlemen, I was very anxious to do so, because I confess that I have a very strong impression of—I will not call it ignorance, because that will be considered an offensive term, but of the want of information respecting the real condition of the Highlands, which exists among many of our friends in the south of England, especially among literary men, and which often, I am afraid, is prevalent in the southern districts of Scotland. I went; and I must say that what I heard in respect to the peculiar absence of information to which I have alluded exceeded my most sanguine expectation. I do not know, gentlemen, whether you will be surprised—I think you will—when I inform you that the thesis or assertion with which this paper started was, that the Highland counties of Scotland were stagnant, and in some cases in a declining state; and the paper professed to account for this terrible phenomenon, that whilst the whole of England and all the southern counties of Scotland, and many even of the counties upon the eastern border, were in a most thriving and prosperous condition, it was undoubtedly a most melancholy fact that the Highland counties of Scotland were in a stagnant, and even in a declining state. Well, gentlemen, you will perhaps desire to know what were the facts upon which this learned gentleman—a gentleman of very great distinction in literary circles in London—professed to found this picture of the condition of the Highlands of Scotland. He had elaborate statistics, which were painted on large boards or canvases, and the main facts to be brought out were these: First of all, then, there was a very small population in proportion to the acreage, as compared with the low countries—certainly a fact not very startling to those who have, as I have done, gone along the great north road, and observed the nature of the country through which this line of railway passes. The second was the proportion of rent to the acres, and I apprehend that farmers in this part of the country would be very sorry to have to pay as much as their more fortunate brethren in the south for the acres they cultivate. The third table represents the proportion of acres in tillage as compared with the acreage in pasture, and I need hardly say that in this respect he pointed out a most terrible discrepancy between the northern and the southern counties. But, gentlemen, the most damning of all remains to be told, namely, that if you walk through the mountains of the Highland counties, you possibly would meet with seven, or even, in some counties, ten sheep for one man. That was the fact that was the clincher to the argument, as showing the melancholy condition of the Highlands. Now it was a very curious thing that there was no table to represent the physical geography of the country—how many of these acres were barren rock, how many were bog, how many were uncultivated and on an angle of 45 deg. to 60 deg., how many occupied the tops of mountains. But no reference whatever was made to the physical geography of this country, without which, I need hardly tell you, the elaborate figures were moonshine, and led to no practical conclusion. I wish to say a word seriously with regard to the impression that prevails in many minds in the south; because I must say that

it is a remarkable fact that in a learned society in the middle of London, containing many eminent men who are acquainted, or who ought to be acquainted, with the condition of Scotland—and my hon. friend Colonel Sykes, the member for Aberdeen, in the chair—such a paper should have been read, showing such remarkable absence of information. Nevertheless, I believe it to be a widespread idea that the condition of the Highland counties is in many respects decreasing as compared with the condition of the country perhaps 120 or 150 years ago. I need not tell you how erroneous this impression is, but I think it worth while to enter into some of the causes of this idea being so generally entertained by our brethren in the south. If I were asked the main causes, I am not sure that I should not allude first and foremost to the influence exercised by the writings of our immortal countryman, Sir Walter Scott. Seizing, as it was his part and duty to do as a great novelist—seizing on those characteristics of the ancient condition of society in this country that were capable of poetical and picturesque treatment, he did treat of these in a manner such as no other man could have treated them—lighting them up with the splendours of his own unrivalled eloquence and genius. The consequence has been the passing over in silence the more melancholy facts in respect to the ancient condition of the Highlander—the consequence has been, I repeat, the general impression now prevailing, that though in ancient times we were terrible and formidable to our friends in the south, yet among ourselves our population at home lived securely and in plenty—living upon the moor fowl and upon the roe and upon the deer, always in abundance, with milk from their cows, and cheese from that milk—the people, in short, though living in a primitive state, were yet in a happy and prosperous condition. Also, when we come to look into the real facts as to the condition of the Highlands before the closing of the great civil wars that were concluded on the Moor of Culloden, that lies close to where I now have the honour of speaking—when we look into these facts we shall find a very different picture. I do not know that many of you may have happened to see a very interesting work, published recently by Professor Cosmo Innes—a thorough antiquary—who describes the condition of the Highlander in the 17th century in these words: "We know, from authentic sources of information, that, in counties where sheep were kept, they were in miserably small flocks, herded close to the dwellings of the owner. Black cattle, in like manner, were few and bad. It could not be otherwise. The mountains swarmed with foxes and wolves, and other cow-stealers more daring and skilful. Every clan was against its neighbour. The country was covered with marauders, to whom everything was lawful booty—that being preferred which could be moved off on its own legs. Even deer were scarce, arising from the state of the inhabitants of the Highlands, always on the verge of famine, and every few years suffering the horrors of actual starvation." Now, gentlemen, this is the picture drawn by Mr. Cosmo Innes, a man thoroughly acquainted with all the old documents which reflect the domestic manners and habits of Scotland during the 17th, 16th, and 15th centuries. There is another cause which has led to the prevalence of the impression to which I have referred, and that is the common notion, which was evidently the notion of Dr. Leone Levi, that the introduction of sheep farming into the Highlands was not an addition to the ancient culture, but was entirely in substitution of it. Now, I believe this to be a very general mistake. The truth is that, before sheep farming was introduced into the Highlands, the pasture of the higher mountains was wholly lost to the use of the farmer, and the low grounds gave food to a few black cattle, while the lower slopes of the mountains during the three months of summer were used for the making of butter and cheese in those little shealings which all of us have seen in our walks on the moors. But the pasture on the higher mountains was absolutely lost. No animal except the wild deer pastured there. It was entirely lost as far as regards the production of food for the human race. The introduction, therefore, of sheep farming, which took place exactly

100 years ago—for I believe 1764 was the first year they saw this system introduced into the Highlands—as really an addition to the food-producing capabilities of the country, as if the tops of the mountains had been for the first time reclaimed from the ocean. I do not mean to say that sheep farming is not, in certain particular districts—in the narrow glens of our West Highlands, where the cottar tenantry maintain a miserable cultivation, living upon very bad oats and very bad here—I do not mean to say that sheep farming may not have been a substitution in some of those localities; but I mean that sheep farming has been, not a substitution of ancient tillage, but wholly in addition to it; and if you count it acre for acre, you have four or five times the amount of land under tillage now which you had one hundred years ago. And one of the best proofs of this is the extraordinary and almost incredible rise in the value of land which has taken place in the course of the last hundred years. To illustrate this, I may mention a particular case which came under my own knowledge during the last few years. I know one estate, of which I have the complete rent-roll of one hundred years ago, and at the conclusion of the civil war the rental was about £5,000. It is no longer in the hands of one person, but is separated into several hands; and I know that the lands which from 1756 to 1760 represented only between £5,000 and £6,000 a-year, now represent a rental of nearly £70,000. Now, making full allowance for the difference in the value of money, you will at once perceive the sort of increase that must arise from having the new cultivation and the employment of land in entirely new purposes; and I must say that at a time like this, when the working classes are paying 9d. to 10d. a pound for meat, this does seem the strangest accusation to bring against the Highlands, which have used every exertion in their power, by the skill and outlay of capital, to increase the supply of food for the country. A third proof of this misunderstanding is the undoubted fact that, at certain intervals, there have been periods of distress in the Highlands. But I think if you inquire into the fact you will find that the distress has always taken place exactly where the old system has remained unchanged, where we have a very poor cottar peasantry without capital and without skill, living on potatoes and the produce of their little crops, and who, being exposed to the vicissitudes to which our climate is particularly exposed, have felt the pressure of famine, which has, in all circumstances, been a great affliction to the Highlands. Before passing on to another subject, you will allow me to say a few words with regard to the other tenantry. I believe some of the most successful instances of the crofter tenantry are to be found in the immediate neighbourhood of this city. I am told, for example, that they are very thriving and successful in the district called the Black Isle, which, although it no doubt at one time deserved its appellation, ought now more properly to be called Yellow Isle, from the beautiful crops with which it is covered. But I believe the small crofter tenantry will only be able to maintain their places where they are enabled to eke out their subsistence by daily labour; and I believe that in cases of success it has been in consequence of their nearness to towns like this. But in the western district of the Highlands, where access to labour is more difficult, I believe the small cottar tenantry will be naturally replaced by a much larger class of farmers; and I do not believe this will be much loss to the country, but, on the contrary, as regards the produce of food for the use of man, that the change will be one more for the better than for the worse. I do not say this, gentlemen, without full appreciation of the merits of the small tenantry; but it appears to me that, after all, there is a very great mistake in the law of the country as to the tenure of land in the Highlands. The tenant-farmers of Scotland may rightly be divided into three great classes. At the lower end of the scale you have the small crofters to which I have referred, and at the other end of the scale you have the great capitalists of Berwick and the Lothians, represented in the Highlands by the larger and more extensive grazings. But between these two extremes there is a large class who are not embraced in them—the great bulk of the tenantry of Scotland, what I may call the middle-class tenantry—men paying between £100 and £500 a-year. Now, although I believe it to be true that the small cottar population of the Highlands is decreasing, I do not believe that this middle class is decreasing, but, on the contrary, is increasing. I myself have had some personal experience of

all these classes of tenantry, and I know very well the immense advantage which it sometimes is to men who own land, and possessing great resources of their own. I know the owners in such circumstances find their rents very secure, and that there is very little trouble for the outlay of capital. I must say this, that tenants lay out great capital themselves without asking their landlords' assistance. I must say, passing from Berwickshire and the Lothians, that I never can cease to admire the magnificent crops there exhibited; and notwithstanding my own preference, perhaps arising from early associations and from the appearance of the country with which I am most familiar, and where I chiefly live—I confess that I do prefer the landscape which is most thickly covered with happy industrious homes. I should be ungrateful to a class of men to whom, I believe, the landowners of Scotland are under very deep obligation, if I did not say that I believed a great deal of the improvement of the land in Scotland has taken place under the care of men who are not great capitalists, who have seldom more capital than just enough to stock the farm, and have beyond that to depend upon their own labour, and that of their sons and daughters. I should indeed deeply regret any change, from whatever cause it might come, which would tend to depreciate or disparage the middle-class tenantry in Scotland, or which would tend to substitute for them men of great capital like the capitalists of the Lothians, or the great sheep-farmers of the Highlands. I hope the great class of tenantry will continue to thrive and prosper, and that it will be the object of the landlords of Scotland to preserve them. Now, having said so much with reference to the inferences that have been erroneously drawn from false statistics, allow me to pass to another subject, to which I referred when first I had the honour of presiding over this Society, and which I must be again allowed to refer to, as it is the last time I shall have the honour to address you in the capacity of your president; and that is the importance of having real, genuine statistics to oppose to those imperfect, and, it may be, false statistics, which are culled from accidental sources of information by such eminent men as Prof. Leone Levi. I don't think that the errors into which that gentleman fell were due to the fact that he relied on statistics; on the contrary, the errors into which he and others fell are due to the fact that we have no reliable statistics of agriculture in this country. It is a disgrace to us that we should have to make such a confession at this time of day. I do not say this deprecatory of the Highland Society; because, so far as the Highland Society is concerned, mainly through the exertions that have been made by our distinguished secretary, Mr. Hall Maxwell, we have attempted to get something like a system of agricultural statistics for Scotland, but from various causes, to which I need not refer, he attempt broke down. The only part of the United Kingdom which is now able to present a complete and satisfactory statement of its agricultural produce is the sister-kingdom of Ireland. I have now to inform you that it is the intention of Her Majesty's Government to endeavour to get England and Scotland to provide a complete system of agricultural statistics. The difficulty hitherto standing in the way is that we have not had in England and Scotland the same complete machinery as in Ireland. I therefore make an earnest appeal to the tenant-farmers, who are intelligent enough to know the importance of knowledge in all its forms, to second the exertions of the Government to enable them satisfactorily to say what are the number of acres under each crop in the United Kingdom, and to give all such information. Were this done, and had we a good system of agricultural statistics, we should be able more effectually to refute the erroneous statements made by Professor Levi in his paper. Before passing from this subject, will you allow me to mention that at the end of Professor Levi's lecture I ventured to make some statements to the Statistical Society of London, which were very favourably received, and they asked me to prepare a paper on the state of the Highlands for the last 100 years—to be read at the next meeting. I should be very glad if any gentleman connected with the Highland counties would supply me with any information as to the traditions of his own neighbourhood or with facts coming under his own knowledge in regard to the people in his own district or county, as to the quantity reclaimed within a given period, and the condition of people now as compared with their condition sixty or one hundred years ago.

EARL GREY ON NORTHUMBERLAND FARMING.

At the Northumberland Agricultural Society, Earl Grey who occupied the chair, in proposing "The Northumberland Agricultural Society," said he saw around him in that place clear evidence that the society was well supported by those who were interested in the cultivation of the land of Northumberland. And he was told by those who were far better judges than himself that in the show-yard there was also abundant evidence, in the excellence of the stock and the number of the implements, of the progress which agriculture was making in the county. He was assured that the exhibition of stock did the highest credit to the breeders of Northumberland; and the fact that so many and such valuable implements were shown was, he thought, unmistakable proof of the progress which was making in improved farming, because, of course, those implements were not brought there unless the makers expected to find a demand for them among the farmers. They had, therefore, he thought, clear proof that agriculture was advancing in the county; and he believed that to that advance the Northumberland Society had in no small degree contributed. For many years they had been annually bringing together the owners and occupiers of land to enable them to see each other's breed of stock, and thus a very great impulse was given to the farming of the country. It was to those that, at least in a great measure, they might attribute the progress which had been made. As to the fact of the progress, he thought that no doubt could be entertained by any who, like himself, were old enough to remember what the state of things was twenty-five or thirty years ago. The change in that time seemed to him, in looking back, almost marvellous. They remembered that at that time attempts which had been made to improve farming were few and feeble. Now, on the contrary, scientific farming was almost universal throughout the county. The sums which had been spent on drainage in Northumberland in the last 25 years alone might, he believed, be written not by thousands of pounds, but by hundreds of thousands. They also saw similar improvements in farm buildings, especially in the most important of farm buildings—he meant the cottages of the farm labourers. He could remember the time when the dismal Northumberland farm cottage was almost a by-word in the kingdom; and to a great extent he thought they deserved the reproach—they had incurred it by the state of their cottages. But he was happy to believe that at the present moment there was no county in England in which more had been done in a limited time to improve the dwellings of the labouring class than in the county to which he was proud to belong. Within the same time they had also seen a wonderful change in the process of cultivation. Up to a certain number of years ago everything seemed to have got into a state of stagnation. People merely followed the beaten track of their forefathers, and there was scarcely known an attempt on the part of farmers to depart from time-honoured practices of former days. But they had latterly awoke from their trance. Extraordinary efforts had been made; and they now saw in every department of farming a wonderful change. The implements which they now know were no longer the old-fashioned ones of their forefathers; and there was no county in England where a larger proportion both of their grass crops and of their corn crops was got by machinery instead of by hand than in Northumberland. That had all been done in a few years; and he was informed a few days ago by a tenant of his own that the cost of harvesting the crops now-a-days by machinery was less by one-half. That was all improvement. And in the same manner the increase of stock and the improved modes of managing it—the improved modes of cultivating; were all testifying to the progress which had been made. No doubt the farmers had a hard task in bringing about the great improvements they had done; but they had proved themselves equal to the task, and the proof of it was that at that moment the price of land in Northumberland was higher than at any former period, and it apparently tended rather to rise than to fall. The difficulties of the farmer had latterly been very great, but perhaps in the last twelve months those

difficulties had been greater than usual, because, if he was not misinformed, the past year had been one of pressure and heavy trial to a large proportion of the county. If he was not mistaken, they had most of them found that the corn crop of last year was a very disappointing one, probably owing to the severe winds which prevailed at the critical season, and thus the crops had not come up to what was expected; and while the greater part of England had an unusually bountiful harvest, in Northumberland, on the contrary, the farmers had in general less than they calculated upon. That fact had been a heavy trial to the farmers of Northumberland; but it had been met in a great deal no doubt by the high prices they had received for their stock. That seemed to him to mark a sign of the reduction in the price of corn to which they would have to look forward in the future, because he did not think, if they looked to the future price of that commodity, they could look for any high price for corn in this country. Agriculture was extending and improving all over the world: the facilities of transporting corn were also increasing. Foreign countries were adopting railways, and even those countries which had been most behindhand and the exception were now adopting the railway. Thus those increased facilities were rendering the transport of corn to our shores from foreign countries more easy, and our population were enjoying the inestimable benefits of that cheap food which conducted so much to the general prosperity, and it was not likely we should return to the old prices. With respect to the growth of wool, the improved welfare of the population, their increasing numbers, as well as the increasing daily comforts of the people, would promote the demand for woollen clothes. On the whole, he thought that, with respect to farmer's stock and the growth of wool, they might look for a continued high price for some time to come. And that appeared to point out to them the direction in which their efforts should mainly be made in endeavouring to meet the difficulties which surrounded them as farmers. He was persuaded that the old-fashioned system of trusting to a weak crop for fallow was gone for ever. As to the increasing of the corn crop, he could tell them that it must be done in combination with an increase in the production of stock, and though there were great difficulties to be encountered—especially in certain districts of the county—in increasing the proportion of stock, from the nature of the soil on some of the heavier lands near the coast, he did not consider the matter a great difficulty. Still, he was persuaded that if they set themselves resolutely to the task they would be able to accomplish it. He looked to their deriving great assistance in that respect from the recent invention of the steam plough. He knew that some of those who had already tried that implement had been quite astonished with its benefits, and they believed that in a few years people would see the flat and heavy lands of this country largely cultivated by the steam plough, and they would by that means be enabled to raise a larger proportion of produce than was now done. He also recommended a greater growth of root crops, though it was almost in vain to grow such crops unless they could have them often. Much, however, might be done in that respect by the use of portable rails or tramways, which in some parts of England was carried out to a great extent, and which did very much in preventing land from being injured in getting away the crops. He believed that they might do more than they had done by feeding cattle with tares and cut grass, and much might be done by increasing the protection of those lands which in the time of our ancestors were considered the main reliance of the country for the supply of food, but which in our days seemed to have been neglected somewhat. He thought he ought to make some apology for having, as a person who could boast of comparatively little practical knowledge, ventured to address his remarks to persons of whom he had no doubt nine-tenths knew far more about these matters than he did. Still he thought it sometimes happened that those who might not be themselves equal to carrying on any branch of industry practically might yet be observers of what was done by others, and, by watching the circumstances of the time and the prospect of the future,

form a sound opinion in what direction the efforts of practical men should be made. But he thought he was not wrong by directing them in the daily occupations on their farms, and the highest authority on agricultural matters concurred with him in saying that their chief attention at that moment ought to be directed to increasing the number of their stock.

NORTH-WEST OF IRELAND AGRICULTURAL SOCIETY.

The annual show, in connection with the above society, was held at Derry on August 9th, and proved a decided success. At no previous show of the society was a finer display of cattle made, and competent judges decided that the exhibition in every department was a very choice one, nothing in the shape of inferior stock having been brought forward. The yard was thronged during the day by ladies and gentlemen, among whom were the Marquis of Abercorn, president of the society; Lord Viscount Hamilton, M.P. for Donegal; Lord Claud Hamilton, M.P. for Tyrone; and Lord Claud John Hamilton, M.P. for Derry City. The acting judges were Messrs. Seymour Mowbray, Charles L. Ellison, and David Hastings; and the following is their award:—

SHORTHORNS.

For the best Bull calved previous to January, 1863: First prize, £8, George V. Hart, Esq., Kilderry, Anif; second, £4, George Cather, Esq., Carrichue, Derry; third, James Sinclair, Esq., Dromore, Coleraine.

For the best Bull calved in 1863: First prize, £8, Major Hamilton, Brown Hall, Ballingtra; second, £4, Captain Perry McChintock, Sessanore.

For the best Bull calved in 1864: First prize, £8, J. G. Grove (Wood), Esq., Castle Grove, Strabane; second, £4, J. H. Brooke, Esq., Brookhill, Derry.

For the best Cow calved previous to January, 1862, in-calf, or having had a calf in 1865: First prize, £5, and second, £3, J. G. Grove (Wood), Esq.

For the best Cow calved in 1862, in-calf, or having had a calf in 1865: First prize, £5, J. G. Grove (Wood), Esq.; second, £3, Samuel Smyth, Esq., The Cross, Derry.

For the best Heifer calved in 1863: First prize, £5, and second, £3, J. G. Grove (Wood), Esq.

For the best Heifer calved in 1864: First prize, £5, J. H. Brooke, Esq.; second, £3, N. M. Archdall, Esq., Crocknacrive, Enniskillen.

AYRSHIRE CATTLE.

For the best Bull: First prize, £5, Mr. William Donnell, Ballinamallard, Strabane; second, £3, Robert L. Moore, Esq., Molenan, Derry.

For the best Cow, calved previous to January, 1862, in-calf, or having had a calf in 1865: First prize, £3, Robert L. Moore, Esq.; second, £3, Mr. John McIvor, Grange, Strabane.

For the best Cow, calved in 1862, in-calf, or having had a calf in 1865: First prize, £2, Mr. Gavin Craig, Oughtymoyle, Magilligan.

For the best Heifer, calved in 1863: First prize, £2, Mr. Gavin Craig; second, £1, Wm. Knox, Esq., Clonleigh, Strabane.

For the best Heifer, calved in 1864: First prize, £2, and second, £1, Mr. William Donnell.

CATTLE OF ANY DISTINCT BREED OTHER THAN SHORT-HORNED OR AYRSHIRE.

For the best Bull, £5, Samuel Gilliland, Esq., Brookhall, Derry.

For the best Cow, calved previous to January, 1862, in-calf, or having had a calf in 1865: First prize, £2, and second, £1, Samuel Gilliland, Esq.

For the best Cow, calved in 1862, in-calf, or having had a calf in 1865: First prize, £2, and second, £1, Samuel Gilliland, Esq.

For the best Heifer, calved in 1863: First prize, £2, and second, £1, Samuel Gilliland, Esq.

For the best Cow in-calf, or giving milk (extra prize): First prize, £3, Mr. James Crawford, Rosnagallagh, Waterside; second, £1, Mr. John McIvor, Grange, Strabane.

SHEEP.

For the best pure Shearling Ram of any breed: First prize, £5, and second, £3, H. L. Prentice, Esq., Caledon.

COUNTY OF CORK AGRICULTURAL SHOW.

On the 2nd of August, the County Cork Agricultural Society held their annual show on the premises of the Corn Exchange. The show was not so numerously filled up in its several sections as on former occasions; but the general stock of short-horns and sheep were very select, if we except that for aged bulls. In this section there were six entries. The leading animal was Amceer, the property of Mr. Henry Barry, Ballyadam, Carrigtwohill, bred by the late Mr. Coppinger. He was seconded by Mr. Downing's Earl Windsor, which was first in 1864. In the two-year-old bulls there were three entries, Major Wallis, Drishane Castle, taking the first place with Felix, from Mr. Jones of Mullinabro's herd. In the section for yearling bulls there were four entries, Mr. Anderson, Grace Dieu, taking the first place, and Meade and Garde challenge Cup, for Mercury, bred by himself. He was seconded by Sir George Colthurst's Navigator, bred by Mr. Barnes, Westland. The bull calves were very excellent, and contained eleven entries, the first and second honours going to Mr. Welsted, Ballywalter, the prize for the best bull bred in the county, and the Meade and Garde Challenge Cup for Winter King and King Oberon respectively, both got by Elin King.

In aged cows there were five entries, Mr. Jones, of Mullinabro, heading the lot with his Lady Spencer, which was the prize cow at the last spring meeting of the Royal Dublin Society.

In two-year-old heifers there were but two entries, Mr. W. L. Massy standing first with Wood Belle, bred by the late Capt. Ball. The second was Molly, belonging to and bred by Timothy Hallanan, Currae.

In the section for yearling heifers there were five entries, Mr. Welsted taking the lead with Rosette, the prize for the heifer bred in the county, and the Meade and Garde Challenge Cup; got by Elin King out of Rosa by Crusade. She was seconded by Mr. Jones's heifer Lunette, by Master Harbinger out of Luna, by First Fruits.

In horses the numbers were much less than usual; the £50 Challenge Cup for the best thorough-bred sire for getting weight-carrying hunters was awarded to Mr. F. H. Power, Rosken, Mallow, for Mount Zion. In agricultural horses there was nothing deserving of particular notice.

In the show of Leicester sheep Mr. W. R. Meade took first for a shearing ram, bred by himself; the Representatives of J. H. Smith Barry stood second for a Plymouth commended shearing; Mr. Meade taking both prizes for the first and second best county bred.

In the section for aged rams the Representatives of the late Mountfort Longfield took the lead, and the Garde challenge cup, and the first prize for the best ram of any other age bred in the county; Mr. Meade standing second, and taking also the second prize for the best aged ram bred in the county.

In the section for the best pen of five shearing ewes Mr. David Hewitson stood first, and the Representatives of Mountfort Longfield second, and also the prize for the best five shearing ewes bred in the county.

In shearling Shropshire Down Rams the Representatives of J. H. Smith Barry took both first and second prizes.

The judges were—In shorthorns, L. Christy, A. Warburton, and J. M. Royle, Esqrs.; and in sheep, Seymour Mowbray, A. Warburton, and J. M. Royle, Esqrs.

THE IMPLEMENT STANDS AT PLYMOUTH.—

Our report rather strangely omitted to make mention of several firms famous for agricultural carts and other vehicles. Beyond the great Beverley Company, Hayes of Stamford got up a good stand of waggons and single-horse carts, with which, as the return will show, he took a number of prizes. There were also some exceedingly well-made and nicely-fitted carts, and a wagon that tips its load sideways, on the stand of Messrs. Thomas Milford and Son, of Thorverton, Devon. George Milford, of the same place; F. P. Milford, of Kenn, near Exeter; Fry, of Bristol; and Ball and Son, of Rothwell, also exhibited very well-designed, well-built, sound, good harvest carts, marked at very moderate figures. Among the novelties were the feeding-troughs of A. E. Peirce, of Hammer-smith, made of wrought-iron and japanned—probably the best things out for durability and cleanliness, and sold at a low price.

OUR FRIENDS—THE BIRDS.

BY A PRACTICAL FARMER.

I was amused by W. W. G.'s humorous notice of Mr. *Punch's* lines on "The Season for Sparrow Clubs." * * * Nevertheless, we must be upon our guard lest we encourage a dangerous increase of these friendly but highly mischievous geny—the common sparrow. I must confess I am often in doubt whether the usefulness of the sparrow or his mischievous propensities predominate. To look at him just now, I should say he was the most impudent, audacious, destructive little rascal known. There he is, looking at me through my open window, as careless and independent as if the whole world were his own, and not caring to quit his perch although he sees me move close upon him. Then look at my spouts how they are pestered by nests; and my climbing roses, my honeysuckles, and ornamental wires and their trailers, how they are encumbered and marred by the like; and, take them down as often as I may, there they are again—a little hard-working persevering saucy rascal, and he is everywhere present. If I go to my poultry-yard, there he and a fine cluster of his fellows are ready to meet me; and in my very presence there they are, picking up the scattered food from the out-skirts; and the moment my back is turned, down they come, regardless of cockerel or clucking hens, and fighting their way for the choicest scraps. In my fruit garden there whole flocks of them are, amongst my currants and raspberries; nor do they disdain to take a pick at most other sorts, my walled plums and pears being very tempting. As to my vegetable garden, why he is a real nuisance, a downright thief: my radish-seed beds, lettuce-seed, onions, carrots, and every other little seed, he will have, unless covered so that it is more trouble than profit to him to get them, and so he is off elsewhere. But this is all as nothing when I follow him to my corn-fields: just look at the headland of the two-and-twenty acres, all the length where the hedge is left to grow for draining wood, why he and his clan have eaten or "champelled" out the whole. You little rascals off, with you! "Boy, why don't you keep them off?" "Can't, sir; they fly to the other end and again." "Do you shout?" "Yes, sir; but they don't care, they just fly up." "Are they making like mischief in the forty acres?" "Yes, sir; I can't frighten them away." "Well, we must poison them; we can't suffer all this damage." "And, sir, they have began of the mangold wurzel seed, and some of them are helping the birds on the turnip-seed, but not many; it's the linnets; but they are on the tares, and the cole-seed, and some are on the light headland of oats, and some where the barley is down; but the wheat is the worst; there are thousands on the wheats, I can't keep half of them off, and I am shouting at them at 4 o'clock in the morning and all day, sir." "Well, my boy, you give a sad account of them. We must get rid of them in some way, that's certain; we can't go on so." Well, I leave the boy, and walk on to the thirteen acres adjoining the sadly-injured headland. What a beautiful crop of mangolds. Why there is not a bare place to be seen. How is this? Last year all my crops were eaten by grub or wireworm, and now how thriving they look! I pass on to the thirty-one acres. What a capital plant of swedes! full everywhere. Last year the grub and wireworm took nearly the whole. This year I have the best plant I have had for many years, and last year it was the worst. I wonder whether the birds have had anything to do with it! I told the

boy we would be rid of the sparrows; but really "I must think twice." I don't think they are any great catch at caterpillars, or they would have cleared my currant bushes long ago; but they are right good hands at little grubs—*i. e.*, wireworms, tom-tailor grubs, and the like; but, best of all, see them on a fine summer day chasing and chasing and chasing butterflies, tom-tailors, beetles, cock-chafers, moths, flies, and innumerable insects in every variety. And then, again, notice them picking up ants, worms, and every little creeping thing, and again see them amongst the aphides, bugs, spiders, fleas, ticks, gnats, beetles, carwigs, and the thousands of flying insects to be found everywhere. I see these busy little birds care less for the larvæ of these insects than the insects themselves: hence their indomitable perseverance and activity. Well, after all, what am I to do? Last year my crops were destroyed by grub, wireworm, and aphides; for I lost 22 acres of beans by aphids. This year all is at present safe. It is true we have a countless number of birds. We have had a fine winter, we have had abundance of food for them, and I know they worked hard both in the field and at every hedge-bottom and tree-root; and we have less grub, less wireworm, less aphides, &c. Now if the winter was favourable for the bird, it would also be better for the grub, or the preservation of the chrysalis, so that we might expect a renewal of attack upon our crops; but this is not the case. How far, then, are we indebted to the friendly aid of the feathered tribe, not forgetting my old friend Mr. Cock Sparrow? In all soberness I must say we must acknowledge our indebtedness. It is mainly to their unceasing inroads upon the retreats of grubs, wireworms, and chrysalides, that our crops are in such an enviable position—that our winter food prospects are so good. I can speak most satisfactorily of a flock of rooks who spent nearly the whole winter upon two fields of mine—one of 24 acres, from which a fine plant of turnips and mangolds were completely eaten off, and the other 22 acres of mangolds and swedes, which were greatly injured. Upon these two fields they were permitted to work as they liked: they burrowed into the light soil to considerable depths, and I believe appropriated to themselves nearly all the grubs and most of the wireworms. The grubs were those of the dart-moth, large and full. On the 24 acres there is now growing a splendid crop of potatoes, and on the 22 acres a good crop of oats: for both I am, in a great measure, indebted to the rooks. These rooks in their way are great thieves notwithstanding; they make sad havoc with the newly-sown grain, young potatoes, ripening grain, &c.; but they in return deliver us from some dire pests. I wish they would use more judgment, but they won't: they pull up the wheat-plant to get at the grub; they tear up the grass to get at the tom-tailor grub; they pull-up the fine turnip-plant to get the wireworm, and so forth, and I put them down as greater friends than enemies to us.

The linnet, again, is a great and indefatigable rogue upon our turnip and coleseed crops: he will not quit his depredations upon them, shoot or alarm him as you will; but then he is equally industrious in searching for larvæ, and even caterpillars, or skimming after every kind of flying insect, from the great dragon-fly to the tiniest beetle. The lark, again, does much harm to the early-sown grain on light soils, but he is ever busy after beetle

and bug-aphis, and caterpillar too, besides his daily exploits in capturing these said insect progenitors in their airy flights. The bullfinch is the worst of the feathered rogues for the buds of our gooseberry, cherry, plum, and other similar fruit-bearing trees, as also our flowering shrubs: he is so notorious as to be named "pick-a-bud" in some districts, but he delights in the insect tribe. The hedge-sparrow, almost harmless, though now and then guilty of trespass, is for the most part supported by insect food. The willow-wren is more addicted to prey upon the tempting young buds of spring, but otherwise its food is all from insect life. The robin is, next to the sparrow, the boldest of our little feathered tribe: its chief food is grubs, worms, caterpillars, and the flying insects. The chaffinch is a great destroyer of our spring flowers, our young turnips, and radishes; but as soon as other food of insect or grub life appears, they are happy in searching after it. The tom-tit is another enemy to our early buds, but he amply compensates for these little thefts by the persevering way in which he draws out the chrysalides from nail-holes and crevices, the secreted spider, and the many hidden inanimate forms of insect life. The titmouse—"long-tailed tom-tit": its food is entirely of the insect tribe, in which pursuit he is most indefatigable, as it is amongst the smallest of the tribe he luxuriates. The blackbird and the thrush have a most unmistakable taste for our cherries and plums; but how often are they seen in full pursuit of the finer specimens of butterfly and moth! and woe to the worm on the lawn should a blackbird come in sight, and snails are not safe before them. The magpie, although so roguish, and so desirous to feed upon a young duckling or stray chicken, is the very best fellow we have for searching out grubs and slugs in our pasture-fields; they even turn over the dried dung of animals, and spread it over the surface, to the benefit of

many a slovenly grazer. The jay, when its progeny requires food, will rob our gardens indiscriminately; but for the remainder of the year they confine their attacks to woodlands and thickets, to seeds, worms, and grubs, acorns and crabs, &c. The wryneck, the nightingale, the swallow, the martin, the redstart, the fieldfare, the starling, the lapwing are, more or less, birds of passage, or locating occasionally in one district and then another. Their food is almost entirely the produce of our woods, copses, and hedge-rows for the one part, and of the fly, insect, and grub tribe on the other, and immense quantities of all these tribes do they consume. Verily we are greatly indebted to the feathered tribes for much of our prosperity, as farmers, although we occasionally suffer damage. My private opinion is this: I think God so orders and ordains all things for the good of His creatures that we may safely and securely leave all to His guidance. His stormy winds or winter's blasts would soon relieve us from any excess of danger from His minor creatures. All, I doubt not, is wisely ordained, and it is only for us to make use of those salutary and customary devices for our daily protection as we usually adopt. I cannot think it altogether or perfectly justifiable to destroy any of God's creatures for the mere sake of getting rid of them. There must be some justifiable cause, or it should not be done. Hence I am an advocate for frightening away from our crops these feathered rogues, rather than destroying them; and I think I have shown that the balance between the injury they do and the good they achieve is much, if not altogether, in their favour. It will at all times be found that the cause of their congregating in great numbers upon one particular place or crop is that this particular crop is in advance of all others; but as soon as these come up to the same advancement, then they disperse. They must be kept aloof during this interregnum.

VALUATION BY ARBITRATION.

TO THE FARMERS OF CORNWALL GENERALLY, AND INCIDENTALLY TO ALL OTHERS.

GENTLEMEN,—The time is near at hand, viz., Michaelmas, when many changes of occupation annually take place, and it is a common practice to take crops, and sometimes stock and implements, by valuation. For many years past I have considered the usual system adopted in arbitration to be very absurd. I believe I may say that there are three separate systems in practice. First, the buyer and seller each chooses a valuer, and these two select a third, whose decision, in all cases of dispute, is to be absolute. If the two first chosen cannot agree on any particular valuation, the third man is called in by them. He is told the opinion of each. He then says what he thinks ought to be done, and his decision is final, if he is farther from the truth than either of the others; but the common practice of this *third man* is to *cut the difference in two*. The second system is, the three arbitrators are chosen as before. If the first two cannot agree, the *third man* is called in—told what the two have in dispute; he is then to give his decision, but that must not be above the highest nor under the lowest; and the probability is that he, too, as in the former case, will *cut the difference in two*, or very nearly so; hence the system of *cutting in two* is so well known, that the two first arbitrators find it desirable to *drive a bargain* rather than say really what they mean. The third system is, the three men are chosen as before, and if the first two cannot agree, they call in the third. He is not told what the two think, but passes his own judgment, which is final, though it may be much higher or lower than either of the others, so that in any case of dispute the opinion of one man only out of the three is taken to decide the case.

Now, gentlemen, the inconsistency of such systems of valuation must, I think, be apparent to anyone who reflects at all on the subject. The first two are fraught with the greatest

temptation to dishonesty; while the last takes all the power out of the hands of the two first, and gives it all to one, which cannot be what was originally intended by choosing three men.

I will just give a practical illustration or two which has come under my own notice. First, two arbitrators are called in to value stock, implements, and furniture. They agree till they come to the last piece of furniture, on which there is a difference of opinion of 15s. as to the value of the article. Neither will give way. They send a distance of four miles for the *third man*: he comes—asks what there is between them—is told 15s.; his reply is, "*Cut it in two.*" for which act they have to pay him the usual guinea fee. A second case occurred last year. The first two umpires go into a field of barley. The seller's umpire says there are 75 bushels per acre; the buyer's umpire says there are not more than 42. Each is firm at what he says. The *third man* is called in, and he says 60, which is probably near the truth, but, as usual, is nearly *cutting it in two*. Such cases as these are common in valuation by arbitration. The case, however, is much worse when one umpire is reasonable, but the other unreasonable. Say John Jiles is a mean, inconsistent man, and values for the seller. Henry Stiles is a reasonable, honest man, and is the valuer for the buyer. John Jiles invariably sets down six or nine bushels of corn per acre more than he really thinks are in the field; or, if he be for the seller, sets that less than he believes the crop to be. Henry Stiles cannot be so dishonest, but says nearly what he believes and knows to be correct. They cannot agree. The *third man* is called in, and he, as usual, *cuts the difference in two*, or nearly so, biased, to some extent, as he cannot help being, by the two opinions he has heard. In such cases much loss is sustained by the person whose valuer is a fair honest man. In the third system, where

the third man is not told what the two think, a case occurred thus: Two valuers cannot agree on the value of a hay stack. The third man is called in, is not told what the two think, sets his value, which is higher than either of the others, and is perhaps the most out of the way of the three, yet his opinion is final.

Now, gentlemen, the course I recommend is plain, pointed, and practicable, viz., choose your men, and they the third man, as before. When the first two cannot agree, call in the third man; say nothing to him as to the dispute; let him put his own judgment; add that to the one nearest him in value, and halve those two for the true value. This would make such

valuations as dishonest John Jiles's useless, or else make him approach as near the truth as he could, and hence be the means of making all dishonest valuers approach to honesty and truth, and make useless the present system of dishonest "bunter," and give the opinion of two men out of the three for the decision. If any person can offer a better system, or improve upon this, I shall be glad to see their opinions upon it; but if they cannot, I hope they will do all they can to get this improved system of mine adopted.

I am, gentlemen, yours, &c.,
Talskiddy, St. Columb,
 July 26, 1865. THOS. ALLANSON.

IMPROVEMENT OF TIDAL RIVERS.

Much of what was said in a previous article on the reclaiming of land from the ocean by embanking, applies to the deepening, embanking, and reclaiming of land from tidal rivers, with a view to improve their drainage, navigation, and fisheries, as well as the adjacent lands on both banks for agricultural purposes. Our remarks at this time will therefore be chiefly directed to the proper form and inclination of the channel of the river, so that the general question under consideration is one in practical geometry, scientifically speaking, as applied to river improvements.

"Given the difference of altitude between high and low water at the mouth of a river, the length of the tidal channel, and the volume of river water, required the dimensions of the channel and embankments," is a proposition that has sadly puzzled many a promising agricultural student long before now, and in all likelihood it will afford to young tyros the elements of botheration for a long time to come. The ancient historian Herodotus never fell into a greater mistake than when he gave a blind credence to the priests of Egypt, who informed him that geometry was first invented by them; for the changing of the course of the river Nile, and the other river improvements thereby effected by Menes, long before their order of priesthood existed, proves not only a practical acquaintance with applied geometry, but also with the experimental solution of our proposition itself; while Noah's Ark, the Tower of Babel, and the irrigation of the plains of Nineveh and Babylon on the Tigris and Euphrates, from whence Menes and his followers came to Egypt, further proves that the antediluvian patriarchs must have taught their offspring the science of geometry as applied to agriculture and the other arts. Both before and after the Noachite deluge, the whole human race were divided into castes; and, at that time, geometry belonged to the caste that included the agricultural body. Practically speaking, Noah was by profession familiar with geometry. This is manifest from the dimensions of the ark, which involve a knowledge of the geometry both of solids and superficies. It is equally manifest that Noah and his sons taught their offspring, and that geometry was at this early date well understood. The ruins of the great cities and works, which cover the cradle of our race to this day, prove the soundness of the conclusion. They even do more; for they leave it manifest that those at the head of the agricultural body, such as Noah, were better versed in this branch of science than those who occupy a similar position at the present day. No doubt, when mankind began to multiply and congregate in large cities such as Nineveh, geometry was then taught at the gates by aged and learned men, who made this a part of their profession, teaching all who entered in or went out of the city, but more especially the youth of that period. In teaching the elements, diagrams were made upon the ground with a staff—a method which has come down to our own times, and which, although rude as compared with the more refined one of the modern class-room, is nevertheless equally truthful and instructive. Boys are fond of making "circles," "love-knots," &c., and an innumerable variety of figures, with the prongs of a fork or the like—figures generally emanating from the circle—and not a few become proficient also at elliptical and parabolic curves. So far, well. But, unfortunately, their education in this respect stops exactly at the point where it should practically begin, viz., the application of

geometry to useful purposes, such as the solution of our proposition. It was not so in the days of Noah, Shem, Ham, and Japheth, nor in those of Abraham, Isaac, and Jacob; for the Hebrew historian Josephus tells his readers that it was Joseph who first taught the Egyptians geometry; and, although he is wrong in this conclusion, there cannot be a doubt that very many extensive river improvements were effected under the immediate superintendence of Joseph in the great valley of the Nile, and that during the whole time the Hebrews were in Egypt much of their time was occupied in carrying out improvements involving a knowledge of practical geometry—solid and superficial; and, further, that Egyptian tyros, Hebrew and Coptic, had to address themselves both to the scientific and practical solution of our proposition, and so on for all subsequent ages down to our own times.

The above proposition on the form of the channel of a river involves two practical questions—the one in the geometry of solids, and the other in that of superficies; and, as the sloping sides of the channel and also those of the embankments are parabolic-curved surfaces, and not straight-inclined planes, for reasons stated in a former article, it follows that both questions belong to the higher division of the science and practice of geometry. And it may be added that we have purposely made the somewhat lengthy digression contained in the preceding paragraph, in order to show the reader that the application of "Euclid's Elements" to the improvement of our rivers is not a bookworm innovation or new-fangled notion of modern times, but the sterling experimental philosophy, or practice with science, of all ages past and present. That this application of Euclid's Elements of Geometry, as taught by himself, has been sadly neglected in modern times cannot be denied; for it is but too truly verified in the state of our rivers themselves, generally speaking—the physical laws of Nature and the science of geometry harmonising therewith being both sacrificed to a sort of fashionable time-serving expediency as it were, improvements being executed according to a routine-pattern handed down from one generation to another.

The fifth proposition in the first book of Euclid's Elements, for example, viz., "The angles at the base of an isosceles triangle are equal to one another, and, if the equal sides be produced, the angles upon the other side of the base will also be equal," has got the *soubriquet* of "*pois assinorum*." Now what is a big ditch or river, in ordinary cases, but an inverted isosceles triangle? And when we come to examine practically the equal angles at the base, how few practical tyros are there who get across dryshod with flying colours? In other words, how small in number are the farmers who ever applied Euclid's elements of geometry to the superficies of a drain, ditch, river, or embankment? or the geometry of solids to the contents of the same? although in both cases such is truly the science of the actual practice in question as taught. It follows therefore that if farmers are to learn the science of this branch of their profession, they must become masters of the application of Euclid's Elements to river improvements; and much more than the few books of Euclid's Elements that have come down to our day, and which do not contain the conic sections, are absolutely required, the curve of a parabola being essentially necessary to elucidate and exemplify sound practice. In other words, when spoken in plain English, "*pois assinorum*," although the common rule taught both in agricultural works

and in the actual formation of rivers as an art, is not sound doctrine! Hence the injury which the banks of improperly-formed rivers and ditches sustain from the action of the water, more especially when the flowing current is of considerable depth and breadth, and exposed to high floods, tides, and storms.

Were the course of tidal rivers straight, and the bottom of their channels of uniform inclination, the practical rule would be simple, as in such cases they would increase in breadth towards the mouths as they increased in depth, due provision being made at the same time for the action of waves towards the ocean.

In practice, however, tidal rivers flowing in right lines, and at a uniform inclination and velocity, at low water, are the exception, and not the rule—so much so, that there is probably not a single normal example of the kind to be met with in the United Kingdom, to which the above rule applies to its naturally-formed channel. Where art interferes to control the operations of nature, new channels may be made straight, and the old crooked ones filled up with the newly-excavated materials; or the old channel may be straightened by means of dredging and embanking, and the bottom of the bed of the river may at the same time be reduced to a common and nearly uniform inclination. Several artificial examples of this kind might easily be quoted, were it necessary, where old outfalls have been straightened and new ones made, the old having been filled up, or converted into canals or other purposes of navigation.

When large rivers deposit much mud, forming new land rapidly at their confluence with the ocean, very great care requires to be observed, both in making a new outfall and in straightening the old, by individual landowners occupying only on one side of the river, otherwise they may do an injustice as readily to themselves as to their neighbours. Land, for example, was rapidly being formed on the right bank of a river where it entered an arm of the sea; but, inadvertently, a vessel was allowed to discharge some ballast at a turn or bend where it was presumed by the captain of the vessel that it would help to straighten the river and improve its navigation. But the hypothesis was unfortunate, the very reverse being experienced; for it so happened that during heavy storms, floods, and high tides, the course of the stream gradually changed, the formation of new land taking place at the left or opposite bank of the river, while the navigation of the channel at its mouth became more difficult than previously. Similar effects are produced up the river, the current being liable to be deflected from one side to the other even by the stoppage of tree roots, to deepen the channel unequally, and to cut in upon one side or slope, if not protected, and to deposit gravel and sand, thereby raising sand-banks, much to the injury both of the navigation and drainage. And such results are equally liable to be effected, whether the process of straightening is by deepening the channel where "races" and "fords" have naturally been made, or by narrowing it by embankments where "pools" and broad parts have been formed.

It often occurs, in inland tidal examples of this kind, that the natural work of formation originally affords the safest practical rule for the operation of deepening, strengthening, and improving the bed of the river by artificial means. By what law or combination of forces have the river and tide scooped out the channel in which they flow, winding it about so as to increase its length from two to perhaps four times, making it broad and expanding in one place, narrow and deep in another—here having a perceptible inclination, but there a comparatively standing, or rather boiling, "pool" or "pot"?

In this natural work four causes may be said to have operated towards its completion: the first of these is the general inclination of the valley in which the river flows, as the valley of the Thames or of the Forth; the second is a diversity in the quality of soil of which the valley is formed; and the third and fourth involve the action of the flowing and ebbing tide, and that of the gravitation of the river, together with the action of the winds and waves in stormy weather.

1. If we assume that the length of the tidal channel is ten miles, measured in a right line, as the crow flies, but thirty miles by the circuitous meanderings of the channel, and that

the total fall—say, for the sake of easy mental calculation—is twenty feet, such data would give an inclination of two feet per mile in a straight line, but only one-third of this in the bed of the river, *i. e.*, a fall of eight inches per mile. The former of these inclinations is uniform, but the latter—the natural fall—is the contrary, as has already been stated, the flow being rapid in some comparatively shallow places, but "boiling" whirlpools in others, and the lengths of the pools generally exceed those of the "rapids," or "races," or "fords," as they are provincially termed.

2. We must next take the reader back to that period in the history of the valley when the tide and river first began to perform their respective operations towards the completion of the channel of the river as it now exists, and here we shall find a very unlevel foundation to work upon, with an excess of mud suspended in the river, and a correspondingly rapid deposit of fresh soil, which fast fills up and levels the hollows, raising the surface, and bringing the whole to its present comparatively level state. But in this natural work of bygone ages we need hardly point out how diversified is the quality of the soil, old and new, which thus forms the channel, as all who have anything to do with rivers of the kind must be practically familiar with it.

3 and 4. Flowing water in a valley has a natural tendency, so to speak, to collect into one volume in a channel, and to scoop out and deepen that channel in a right line by its continuous action; while sea storms and river floods would both play havoc at the commencement of the work in a manner which we shall not attempt to describe. Suffice it to say that both causes work towards a common ultimatum—*viz.*, the present bed of the river—which may safely be left, like all other works of Nature, to bespeak its own philosophy, affording a very instructive lesson to all who comprehend its expressive language. During a flood in the river, for example, the velocity of the current, where it becomes confined between narrow banks, is greatly increased; consequently, sand and gravel brought down with the stream is swept through this narrow part of the channel into the broad-expanding basin immediately below. Here the velocity being insufficient to carry it further, the gravel and sand are deposited, thus forming a shallow bed ultimately, and hence a rapid having an increased velocity during the ordinary state of the river. The details of this will be more fully explained under mountain rivers: at present, enough has been said to account for the natural formation of the unequal inclination of the channels. A velocity of current due to an inclination of two feet per mile would soon sweep away to the ocean in floods the ordinary materials of which the bed of the river was formed, cutting it down to low water, or rather deep-sea level; but the original unlevelness of the ground, and the accumulation of gravel, together with the opposition of the flowing tide, had diverted the stream into the circuitous channel it now occupies of three times the direct line, thereby reducing its velocity in the inverse ratio, or from two feet to eight inches on an average, but less than this over its greater length.

In the tidal portion of rivers, therefore, there should be no narrow and broad places, pools, and rapids, the inclination per mile being reduced to the minimum requisite to keep the channel free from silting at low water. This will depend upon the nature of the soil in the valley, so that every individual case or valley must furnish its own practical rule. If we assume that a fall of six or eight inches per mile is sufficient, and that the length of the river can be shortened two-thirds by straightening the channel, it will greatly increase the fall for drainage at low water above the ordinary limit of the tide, or nearly fourteen to fifteen feet. It is seldom, however, practicable to bring such winding rivers into a right line; but much can be done to straighten, deepen, and shorten them in the vast majority of cases, thereby improving both their navigation and drainage. And this is annually becoming more and more a practical question that imperatively demands public attention; for, as we progress in steam navigation, the old nautical objection to straightening—that the windings and broad places are needful to aid in tacking and beating against the weather—is wholly out of date and no longer tenable.

ΓΕΩΜΕΤΡΗΣ.

HAY AND STRAW ELEVATORS.

AMERICAN LOADERS AND STACKERS.

The paucity of agricultural labourers, and the consequent high price of labour in the United States of America, have greatly stimulated the invention and improvement of "labour-saving machines," and to this general rule hay and straw elevators form no exception. Composed of emigrants from every province of Europe, it was natural for them to carry out with them the labour-saving practices of the mother-country with such improvements as the peculiar requirements of American agriculture demanded, and this is exactly what we find to be the facts of the case as recorded in the earliest writings on the agriculture of the Union. Hence the practice of stacking hay and straw by horse-power has come down from time immemorial to the present day unbroken. In other words, we can trace back the existence of the ship-tackle practices of the mother-country (chiefly England and Holland) to the commencement of the present century; but, prior to that, the chain of history is so broken that the search cannot be further prosecuted: and even up to 1830 much has to be supplied in order to place the subject in a practical working form, agricultural writers apparently taking it for granted that what was generally practised was universally understood. And, doubtless, so it was at the time; but in the United States, as in this country, the progress of mechanical improvement was so rapid and great about the end of the last century and the beginning of the present one, that the farmers of the latter period hardly knew what those of the former practised. But, after the issue of the U.S. patent-office publications, the progress of discovery and improvement is more easily traced.

In this branch of agricultural mechanics, as in reaping machines, our Transatlantic cousins are ahead of us. True, since 1851—what between the stimulus of cheap patents, and the still more encouraging influence of the Great Hyde Park Exhibition of the above year, when McCormick's and Hussey's reapers made such a triumph in our harvest-fields—we have been beating up, and perhaps are at the present time ahead as to straw-elevators; but, when we embrace the operations of loading and stacking hay in hay harvest, the mother-country, it must be confessed, is yet unquestionably a long way behind.

The difference in question no doubt arises from the difference that exists between the state of the labour market in the mother-country and the United States, "*Necessity* proving herself to be the mother of invention" in the latter—thus continuing to verify the truth of the old proverb. And what merits a special notice under this head is the fact that the English farmer had fewer mechanical appliances in stacking hay and straw at 1850—the middle of the present century—than he had at its commencement—1800; hence the characteristically lukewarm reception which Cornes's elevator received when it made its appearance in 1846 at the "Highland capital" of Staffordshire, as Leek has honourably been designated.

Long before 1846 the more successful go-a-head farmers of the New World were loading and stacking both hay and straw by horse-power in various ways as to mechanism—ways which we are only now beginning to imitate, and even squabble in courts of law as to the priority of merit and patent right of the important discoveries we are making!

The different mechanical appliances involved in the American loaders and stackers embrace the following five principles, viz. (1), the old ship-tackle bundling system; (2) a lever fork; (3) "a traveller band;" (4 and 5) the horse-fork, endless rake, and inclined plane. From the United States' Patent-office publications already referred to, and agricultural periodicals, it appears that between 1838 and 1843 all the above plans were in keen rivalry and competition both in the patent-office and harvest field; and we further learn, from the claims of patentees, that all the above plans are old inventions, which had been in use from time immemorial, the claims of the inventors being limited to special improvements upon the several old plans in question of loading and stacking hay and straw by horse-power.

We beg to draw the special attention of those of our readers who may wish to examine for themselves the United States' Patent-office publications in the English Patent-office to this peculiar characteristic of disclaiming, as it were, in their claims, what is public property in the old plans, in order to show more clearly the special improvements for which American patents are obtained, lest they should overlook the importance of the practical conclusion to be deduced from it. Further, we are the more induced to do so as they may not have access to the United States' agricultural publications which notice the old loaders and stackers, and improvements therein that have never been patented.

To notice the annual crop of American patents for hay and straw loaders and stackers during the last twenty-five years, or quarter of a century, is far beyond the limits of our present paper. We shall therefore confine our observations to one or two patent examples under each of the above five principles, and to a few extracts from United States' agricultural and scientific periodical publications describing unpatented examples, and also of the more promising combinations of the several plans; and in doing so we shall rather follow the chronological order of examples, without regard to the order of the above subdivision of principles, as this will illustrate more successfully and intelligibly the progress of improvement both as to loaders and stackers.

Example 1.—Uriah Beebe, of Clarendon, New York, obtained a patent, dated March 28, 1838, for improvements in machinery for conveying straw from thrashing machines. The special claims of the patentee are not given in the Patent-office report of this date. At this period elevators were termed "straw-carriers;" and the one under notice appears to have been somewhat similar in principle to Glandstone's "travelling shaker." When only used for separating the corn from the straw they were, and are still, termed "separators."

Ex. 2.—Russell Tomlinson, Jackson, Michigan, claims, in his patent (No. 4,594, 1846), "hinging the slats, where they are attached to the chains or belts of the straw-carrier or separator, by which means the slats are nearly closed when on the upper side, and open when on the under."

Ex. 3.—Daniel Woodbury, in his patent (No. 6,235, 1849), both disclaims and claims thus: "I do not claim the endless web or elevator (b) in itself as a new invention; but I claim the projections or pins (c) on the said elevator in combination with the rack or slat-frame (d). I also claim the crank with the toothed roller (e), to give this latter a traverse or side-to-side motion—all for the purpose herein described."

Ex. 4.—Adam Linhart and Samuel McChlain claim, in their patent No. 6,749, 1849, "wire belts or straw carriers."

Ex. 5.—Cyrus Roberts and John Cox, in their patent No. 8,480, 1851, claim "jumping wheels" under the elevator, to effect a similar purpose to Gladstone's Galloway "jumping wheels."

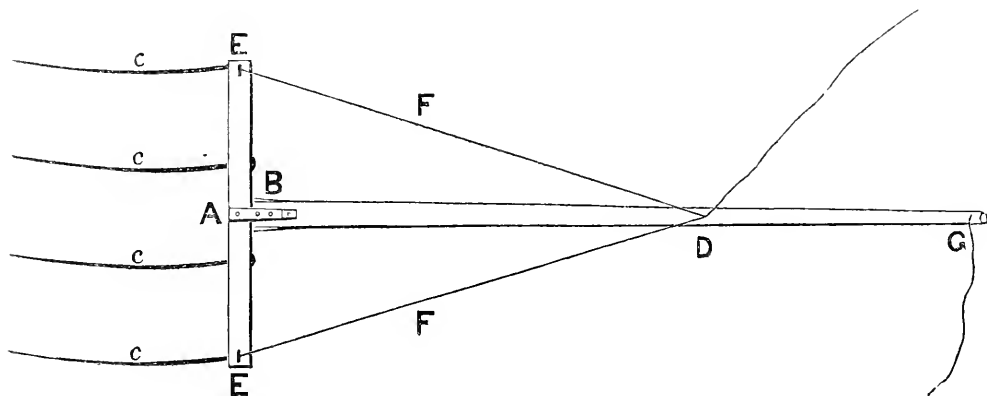
While American agriculturists and implement makers were thus improving their straw elevators for thrashing machines, others were improving their "loaders and stackers" for loading and stacking hay. Thus, in 1843, we find the "horse pitch-fork" successfully at work, pitching one ton of hay 15 feet high in four minutes, which, in a very short time, drove the old Dutch slow-going ship tackle bundling system fairly out of favour in the estimation of every go-ahead farmer—the horse fork being free to the adoption of all from its not having been patented. As the American examples are written by practical farmers, we shall allow them to give their own account of pitching hay by horse-power, by quoting from the *Cultivator*, a monthly periodical similar to the *Farmers' Magazine*.

Ex. 6.—"*Pitching Hay by Horse-power.*"—Having been a reader of the *Cultivator* for some years past, and having never seen any account of pitching hay by horse-power, I thought the following description of a fork, which I have used for the last five years, might be of interest to your readers. The tool is a great saving of manual labour, especially when the hay has to

be put up in high mows. It is simple in its construction, not liable to get out of order when properly managed, and can be made by our common mechanics at so trifling a cost as to put it within the reach of every farmer.

"The fork may be described as follows: A [fig. 38] is the head, 28 inches long and 2½ square, of white oak or some

other strong wood; B is the handle, 5½ feet long, morticed into the head, with an iron clasp, or hand, or hoop-iron to fit tight over the head, and to extend six inches up the handle secured by two good rivets through the handle to increase its strength; C C C C, the prongs of the fork made of good steel and of the right temper, half an inch wide at the head and



[Hay fork, fig. 38.]

drawn out tapering to a point—they are to be twenty inches long, eight inches apart in the head, with a burr to screw them up tight, and a rivet on each side of the middle prongs to keep the head from splitting; E E, staples rivetted over the end prongs to which the rope F F is to be attached—the rope to be drawn together three feet from the head in the form of an A, and then the single rope to extend from that over a tackle block, which is hung to a rafter at the peak of the roof of the barn, and two feet over the side of the mow, and thence to the bottom of the door post where another tackle block is attached, under which the rope passes; G is a small rope attached to the end of the handle, by which the fork is kept level, as it ascends over the mow. As it approaches the place where the hay is to be lifted, the rope should be slackened in the hand, when the hay will tilt the fork so that it will discharge its load immediately. The fork when loaded is raised by a horse, which is attached to a swing tree, to which the rope is fastened near the lower pulley or tackle-block above mentioned. When the hay is discharged from the fork, back up the horse, and be ready for another fork full. The fork is drawn back by the small rope. In this way forklifts can be pitched up nearly as quick as they can be by hand.

"A farmer that has a large quantity of hay to pitch will more than pay for the trouble and expense of a fork of this kind in a single year. With the assistance of a boy to lead the horse to the fork, a man can with ease pitch off six tons of hay per hour, and pitch it from fifteen to twenty feet high. On a trial of speed, I have pitched a ton fifteen feet high in four minutes. The fork does not cost over five dollars, without the blocks and ropes; and I think they can be had altogether, ready for putting in operation, of Garret Brown, Newton, Bucks County, Pa., for seven dollars. (Signed) "A PRACTICAL FARMER."
"Bucks County, Pa., April 1848."

Ex. 7.—(From the *Cultivator*, 1851.—"PITCHING HAY BY HORSE POWER.—I have used a horse pitch-fork similar to that represented by a correspondent of the *Cultivator* for 1848, page 122. It operates as well as there recommended. My object in referring to it here is to furnish occasion to add that I have not only succeeded as well as I expected in the barn, but also in pitching on to stacks. My method of arranging the machinery for pitching on to stacks is as follows: I procured three poles, and chained the small ends together in a proper manner, and raised them in the form of shears, with a pulley suspended at the top over the spot where I wanted the stack. The rope to which the fork is attached is put over the pulley before the poles are raised, then under another pulley in the bottom of one of the poles, about two feet from the ground. A stake is then driven into the ground

at the foot of this pole, to prevent it from being pulled out. Hitch on a horse to the rope, and all is ready. Two of the poles should be about thirty-three feet long, and the other thirty-nine feet. The object in having one pole longer than the others is this: when the fork is stuck in the load, and the horse is pulling on the rope, the poles are likely to be pulled towards the load if they are of equal length; but if one of the poles is a few feet longer than the others, the load can be drawn between the stack and the long pole, and the pole acting as a brace, will make it impossible to pull the three over by pitching. The poles should be as small as can be had of sufficient length, and of some light timber. Mine are bass-wood, about five inches in diameter at the butt. One man can handle them, one at a time; and two men can raise them.

"Sylvania, Bradford Co., Pa." (Signed) "P. P. P."

Ex. 8.—(From the *Cultivator*, 1856, by "P. P. P.," the same correspondent as last, ex. 7.)—"PITCHING HAY BY HORSE POWER.—Mr. P. P. Peckham, of Sylvania, Bradford County, Pa., writes as follows: 'In describing L. F. Allen's barn in the *Annual Register* for 1856, page 179, it is very properly suggested that something is desirable for unloading hay, &c. The plan proposed is so far in advance of the hand-method that I could like it if I thought it the best that might be adopted. Allow me to propose the horse pitch-fork, as described in a back volume I copied from the *Cultivator*, and made the first fork of this kind known in this part of the State about five years ago. Now I think it would be safe to say that about two hundred are in use, and liked well. Some say they would not take a hundred dollars for a fork, if they could not get another. I am aware that an elevator would carry the hay on to a mow, but would be more in the way, and could not be made to carry the hay to any desired locality, as the fork would; besides, with an elevator, all the hay would have to be pitched by hand on to the elevator from the load.'"

Both the old bundling system and traveller bands were proposed for Mr. Allen's barn, and we quote the example to show that both were being fast superseded by the horse pitch-fork.

The next example is also from the *Cultivator*, May, 1859, written apparently by the editor, and embraces patented improvements on the common horse pitch-fork in use.

Ex. 9.—"Every farmer who has ever pitched off from a wagon in a day ten or twelve tons of hay is aware that no labour on the farm can be more fatiguing. The common horse-fork, which to a considerable extent has been brought into use, has afforded great relief, this severe work not only being avoided, but much greater expedition attained. The effective force of a horse is at least five times as great as that of a stout man; and if half an hour is usually required to un-

load from a waggon a ton of hay, then only six minutes would be required to accomplish the same result with horse-power. Actual experiment very nearly accords with this estimate, five to seven minutes only being required by the assistance of the best horse-forks.

"There are, however, some difficulties in the use of the common horse-pitchfork. The most so results from the necessity for the handle of the fork to sweep upwards in a vertical position whenever the hay is dropped from it, and, falling back, it is in danger of striking the operator. It is hence impossible to use it under a low roof beyond perline beams, or when the mow is nearly filled. To remove these difficulties, C. E. Gladding, of Troy, Pa., has recently constructed a fork which, after a recent trial, we are satisfied is an important improvement. It differs from the common horse-fork (Ex. 6, fig. 38) by placing a hinge-joint at the connection of the head with the handle, so that at any moment by a jerk on the cord, which passes up a bore in the handle, the fork is dropped and its load deposited. This may be done the moment it happens to be swung to the most favourable spot. The fork is so long that its weight causes the head to fly back of its own accord and resume its former position, where it is held by an iron catch until the next forkful is to be discharged. It should be observed that the pulley of the rope suspending the fork should be fastened to the highest portion of one of the rafters over the mow, and a smooth board should be placed vertically against the face of the mow for the forkful of hay to slide against in its ascent. By attaching this rope in front of and within a window, the hay is carried with ease in at the window; and thus lofts over sheds, carriage-houses, &c., where the common horse-fork could not be used, are filled by the use of Gladding's improvement. It may (as well as the old fork) be also used for stacking by making a tripod of three long poles from which to suspend the implement."

Thomas F. Jarrett, of Horsham, Montgomery County, Pa., obtained on May 17, 1854, a patent (No. 10,989) for an improved horse-pitchfork of the above kind, and the following is his claim: "I claim setting the catch free when the elevator reaches any desirable height, by connecting the said catch with a weight by a rope, whose length is adjusted in proper relation to the height as described to make the weight operate on the catch precisely when the elevator reaches such a height."

Ex. 10.—U.S., patent, No. 13,908, 1855. A hay-loading lever-fork, actuated from the wheels of the cart. Patentee, John K. Harris. The patentee, in his claims, states that elevators on the endless-web plan were in common operation in the States at the time, and this is the only thing worth quoting.

Ex. 11 (1850).—A series of rakes on an endless belt, &c., for raking the hay from the windrows up an inclined plane into the cart. It is attached to the back part of the cart, and actuated from the wheels. In 1855 there is another example of this kind, but without an inclined plane—viz., No. 12,547. In loading hay, the horses have to haul this cart upon the windrow. But, no doubt, our Transatlantic cousins will get over this objection by "placing the cart before the horses!" or what would be preferable by making the machine rake the hay laterally into the windrow from each side, and by the second and conjoint process of raking it up into the cart, or by a better plan than either of these examples.

In stacking hay by horse-power, the reader will have perceived that the horse-pitchfork takes the place of the bundle, the poles, blocks, and tackle in other respects being similar in both cases, and that the improvement is a question of expedition in favour of the fork. There are, however, several practical objections to the above plans of working the fork, and the following two examples (12 and 13) will show how these are being obviated. The two principal objections are, we may here observe, the depositing of the hay upon one part of the stack only, and the other is the plank against the side of the stack. The improvements therefore consist in giving the fork first a vertical movement and second a horizontal one, and this is now being done as follows:—

Ex. 12.—The pulley over the mow in the barn, instead of being attached to a rafter, is suspended from a small travelling-carriage, that works upon a railway having sufficient inclination to bring back the empty carriage and fork when freed from their load. A second pulley is required at the upper end of the inclined plane or railway. By determining the proper length of the catch-rope and of the horse-pole, the mechanical

reader will readily perceive that the fork-falls may be deposited anywhere along the length of the mow or stack.

Ex. 13.—"Turner's Derrick Elevator, 1864." The title of this machine conveys in the single word *Derrick* a general outline of its mechanism. In principle it is the old Dutch mast and yard, only the yard is rigidly fixed to the mast, while the mast turns in a socket in the bottom and in the collar of a tripod half-mast high, and thus swings the fork-falls on to the stack.

Ex. 14.—The elevation and conveyance of hay and straw in bundles has several things to commend it. Indeed the only objection to the practice of bundling is the manual labour hitherto experienced in the formation of the bundles, for a man would pitch a load of hay in less time than he would require to bundle it. But with straw from a thrashing machine, when it has to be carried to a short distance, it is otherwise, the odds being then against the fork. Consequently for the last twelve years and upwards numerous attempts have been made to solve the problem of self-bundling apparatus, *i. e.* to make the thrashing machine do the work of bundling; but up to a recent date a self-bundling elevator had not been discovered, or at least has not been made public in the United States. American farmers however have long been able to make the bundling apparatus self-discharging by mechanism similar to that used by Jarret in discharging fork-falls from the horse pitch-fork. And we may observe that the first example of this kind which came under our notice was a non-patented one some ten or twelve years ago in an American agricultural periodical.

Ex. 15.—Instead of bundles, by means of slings and similar contrivances, one American farmer proposes elevating hay and straw in nets. Thus when he began to load his hay, he spread a net over the bottom of his cart. When half full, he spread a second net; so that when taken home to the barn or stack-yard, first the one netful was elevated by horse-power and tackle, and then the other, the whole load being thus elevated at two operations.

Some six or seven years ago the old American pitch-fork (fig. 38) was made and used in this country, near Banbury, and we believe may yet be seen in operation. It is the only example we have heard of. ENGINEER.

NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

The prize of £20 for thorough-bred stallions for hunters, which award we were unable to give last month, was given to Mr. Robert Betts, Holbeck Lodge, Horncastle, for Elect, 6 years old, sire Venison, dam by Defence.

The following is a list of

AWARDS FOR IMPLEMENTS.

- Amies and Barford, Peterborough.—Set of harrows for light land, £2; clod crusher, £2; wrought-iron field roller, £2; American grist mill, £2; set of steaming apparatus, £1 10s.; straw elevator, £2; water cart, 10s.
- Ashby and Jeffery, Stamford.—New patent haymaker, 10s.
- Wm. Ashton, Horncastle.—Drag and steel cultivators, £1; horse-hoe for turnips, with steel shares, £1; one-horse grubber, £2; set of chain harrows, £2; stook mover, 5s.; lever lifting jack for waggons, 5s.
- E. H. Bentall, Heybridge, near Maldon.—Subsoil plough, £3; chaff cutter, £1; turnip cutter, £1 10s.; oilcake breaker, £1; horso gear, &c., for two horses, £1.
- John Boyers, Market Rasen.—Set of gig harness, with brass furniture, 10s.; set of four-horse gears, ditto, 10s.
- Thos. Bradford and Co., Manchester.—Family combined washing, wringing, and mangling machine, 10s.; churn, 10s.
- Thos. Brook, Market Rasen.—Two-horse harrow, £1; turnip cutter, double action, 10s.
- George Cheavin, Boston.—Self-cleansing water filter, 5s.
- John Cooke and Co., Lincoln.—Two iron ploughs, £3.
- James Coultas, jun., Spittlegate, Grantham.—General purpose drill, 6 ft. 6 in., twelve rows, £4.
- J. Coultas and Son, Little Gonerby, Grantham.—General purpose drill, 78 inches wide, £2.
- L. Dawson, Market Rasen.—Broadshare and scarifier, £3.
- Farmer and Son, Gainsboro'.—Two-horse mower, £3.
- William Foster, Lincoln.—Combined portable finishing thrashing machine, £5.
- Hy. Grantham, Fulstow, Louth.—Dressing machine, £1.
- Thos. Gell, Hemingby.—Market cart on springs, 10s.

Hays and Son, Stamford.—Two-horse cart, with harvest-raves and fixed sideboards, £2; one-horse Scotch cart, with harvest raves and sideboards, £2.

John Hodgson, Louth.—Six swathe rakes for heavy land, 10s.; four bundles of hay forks, 10s.

Richard Hornsby and Sons, Grantham.—Champion plough, R.A., with two wheels, £3; patent wringing and mangling machine, 10s.; general purpose horse hoe, commended.

George Hunter, Ulceby.—Drag or cultivator, £2; ridge drill, £3; set of harrows for light land, £1.

William Ingall, Normanby-by-Spital, Market Rasen.—Light two-horse wagon, with iron arms, £1.

Dymoke Kerman, Winthorpe, Burgh.—Fire engine, 5s.; 12 American clothes wringers, 5s.; three clothes dryers, 5s.; collection of champion carpet-sweepers, 5s.

Benj. Kittner, Fulstow, Louth.—Corn-dressing machine, £2; blower, £1 10s.; elevator, 10s.

Marshall (Brothers), Kirkby-on-Bain.—Corn-blower, 10s.

Marshall, Sons, and Co., Gainsborough.—Patent complete thrashing and dressing machine, with grinding apparatus, £5.

THE TRIAL OF REAPERS.

This trial took place at Linwood, on the Lincoln and Wragby Road, about two miles from Market Rasen, on the farm of Mr. Burwell, on Wednesday. The business commenced on a field of wheat south of the Buslingthorpe Road, where about 3,000 persons were present, including the representatives of Samuelson and Co. of Banbury, Cuthbert of Bedale, Crosskill of Beverley, and Mr. J. Fletcher of Winterton. After the wheat had been reaped, a field of oats on the north side of the farm, of about 15 acres, was also cut. The machine of Messrs. Samuelson was 35 minutes in reaping one and a-half acres of wheat, and only 31 minutes in cutting the same amount of oats. The next nearest in time was the Beverley Iron and Wagon Co.'s, but the judges awarded the prizes to the latter machine, thinking that for all the requirements of the farm it was the most suitable. The awards are as under:

For the best two-horse machine reaper, with *side* self-delivery. First prize, £20, to Mr. Brooke, of Market Rasen, for the Beverley Wagon Co.'s reaper. Second of £10 to Messrs. Coultas, of Grantham, for the same kind of machine, manufactured and patented by Messrs. Samuelson, of Banbury.

Second Class.—First prize, £12, to Mr. Henry Smith, of Winterton, near Brigg. Second of £6 to Mr. John Fletcher, of Winterton. This reaper had only been tried for a day or two, and therefore stood well as a novelty of manufacture by the exhibitor and manufacturer.

Third Class.—First prize, £8, H. Smith, of Winterton, for Cuthbert and Co.'s one-horse reaper. Second of £5 to T. Simpson, of Lincoln.

ROMSEY COUNTY COURT.

[JULY 25TH.]

IMPORTANT TO FARMERS.—DIXON AND CARDUS v. STEPHEN AYLES.

The plaintiffs in this case, who are oilcake makers at Northam, sued the defendant, who until the last few months occupied a farm at Braishfield, for the sum of £13 odd, the balance of an account for linseed cake sold in May, 1864. The defendant refused to pay the amount until he had been recompensed for the loss of a large number of lambs which he alleged had been killed by eating the cake supplied by plaintiffs.

Mr. Leigh appeared for the plaintiffs, and Mr. Mackey for the defendant.

Mr. Cecil Dixon sworn: In May, 1864, we sold Mr. Ayles two tons of linseed oilcake. We send out about 4,000 tons a-year. Part of the cake has been returned, leaving a balance of £13 odd.

Cross-examined by Mr. Mackey: Mr. Ayles said he would pay the balance when he had been compensated for the loss of his lambs. Mr. Ayles wrote for the cake, and we sent it by rail to Romsey. We sell this cake for sheep. We sell it as good oilcake. About the same time we sold cake to Mr. Burney, Mr. Wallace, Mr. Lywood, Mr. Reeves, and other gentlemen. Complaints were made to us by Mr. Wallace that between 40 and 50 of his lambs had died through eating our cake. The oilcake was composed of linseed, bran, and ground

arashide nut. Cake is not supposed to be made of linseed only. The proportions of the various ingredients vary according to the quality of the seed.

Cross-examined by Mr. Leigh: Bran would not make the cake unwholesome. We sold cake to several hundreds of customers at the same time. We only had complaints from this neighbourhood. We had no complaints of any ewes having died. We have to sift the seed when it comes over, and the quantity of weed seed and other things taken away would be a considerable loss to us if we were not to replace it by something else; and if the cake was only made of linseed we should soon be in the bankruptcy court. All oilcake makers use the same ingredients.

Mr. Joseph Mee said: I am agent to Messrs. Dixon and Cardus. I sold oilcake to two or three hundred parties at the same time. I only had complaints from parties in this neighbourhood. There was great mortality amongst lambs that season. I only know of the composition of oilcake from seeing the manufacture.

Cross-examined by Mr. Mackey: There was nothing more used for this particular batch of cake than at any other time. None of the parties told me directly that the oilcake had killed their lambs. Mr. Ayles sent some of his back, saying that it had killed his lambs. Mr. Wallace said he had lost 46 lambs. Mr. Burney did not speak to me about his lambs. We never bought charlock seed to mix with linseed cake, but for rape cake for manure. I bought 50 lambs of Mr. Wallace after he had complained to me.

Mr. W. H. Gulliver sworn: I received 50 lambs from Mr. Mee, and fed them on Dixon and Cardus's cake, and they thrived well.

This was the case for the plaintiffs.

Mr. Mackey, on the part of the defendant, said that he should prove that the lambs died from eating the cake, as Mr. Ayles had parted his lambs, and those that eat the cake died, and those lived that had none, and many other similar cases.

After a little consultation on the part of the defendant and his friends, they agreed to a verdict for the plaintiffs, as His Honour said that if the case was adjourned the cost of bringing various witnesses to prove it would be very heavy.

THE ROYAL MEETING AT PLYMOUTH.

The following are the attendances day by day:—

	Persons.		Amount.	
Saturday, July 15...	25	.....	6	5 0
Monday, „ 17...	1,063	.....	265	16 0
Tuesday, „ 18...	4,767	.....	595	11 10
Wednesday, „ 19...	17,269	.....	2,159	0 0
Thursday, „ 20...	42,943	.....	2,147	14 10
Friday, „ 21...	21,969	.....	1,999	12 7
	88,036		£6,274	0 3

AN ACT TO ALLOW THE CHARGING OF THE EXCISE DUTY ON MALT ACCORDING TO THE WEIGHT OF THE GRAIN USED.

(Printed by Authority, June 29, 1865.)

This Act will come into operation on September 1 next.

Any maltster wishing to pay duty on the weight of the corn or grain used must give notice in writing to the officer of Excise, which notice would have to be renewed if the maltster discontinued making malt for one month.

Every maltster, prior to placing corn or grain in any cistern for the purpose of malting, must affix a cover to such cistern, with fastenings, &c., to the satisfaction of the officer of Excise.

Forty-eight hours' notice must be given in writing of the day and hour (not later than 12 a.m.) that the maltster intends to steep his grain.

Maltsters must provide correct scales, weights, and bushel measure, which shall at all times be kept in the malthouse.

If the weight of grain is found to exceed the declared weight by 2lbs. per bushel, the penalty will be 100s.

This Act will not repeal any provisions of other malt acts, and will continue in force for four years.

THE OIL REGIONS.

The word "bitumen" is a generic one, comprehending several varieties or species of inflammable substances, found in, and proceeding from the bowels of the earth, applicable to different purposes, and all possessing the same characteristics, namely, 1st, That by exposure to the air and the application of heat, they burn with a flame more or less vivid, leaving no, or scarcely any residue. 2nd, That by distillation they yield a liquid acid, but no ammonia, a small variable proportion of charcoal being left behind in the retort. 3rd, That they are either liquid or are capable of being rendered so by a moderate degree of heat.

Naturalists have divided bitumen into two families—the non-elastic and the elastic. The former comprehends naphtha, petroleum, mineral-tar, mineral-pitch, and asphaltum. The latter includes mineral-caoutchouc and suberiforma-mineral-caoutchoucs. A description of these will show that they are but modifications of the same substance, assuming different forms, but evidently proceeding from the same common origin, which are believed to be the coal-fields, deep down in the earth, the large cavities of which must possess inexhaustible supplies. In proof of this, we may state that the walls of Babylon and those of the tower of Babel itself (according to the Scriptures) were built of unburnt bricks, cemented with bitumen taken from springs of that substance found on the banks of the Euphrates, which have continued flowing ever since to the present day. The following is a description of the different kinds of bitumen as named above:

I. *The non-elastic Bitumen.*—1st, Naphtha: This substance is of a light brown or pale yellow colour, quite fluid, and transparent. It is the lightest of all liquids, its specific gravity being 0.708 to 0.732. It has a pungent penetrating smell, takes fire readily, and burns with a bluish yellow flame, leaving no residue, but emitting and depositing an abundance of carbon in the form of smoke and soot. It may be rectified by distillation with water, in the same manner as the essential oils, and then becomes colourless and weaker in its odour. It does not combine in any considerable degree with either water or alcohol, but unites readily with either turpentine, caoutchouc or the essential oils. When rubbed with the caustic-fixed alkalis, it forms a kind of "Starkey's soap." The concentrated nitric and sulphuric acids are decomposed with vehemence upon it, converting it into a solid resinous substance, soluble in alcohol. Even the purest naphtha, when exposed to the air, becomes first of a yellow and then of a brownish colour, acquires a somewhat viscid consistence, and then passes into petroleum. Naphtha is procured, for the most part, from very copious springs of the substance at Baku, on the shores of the Caspian Sea, where it is collected into earthen pipes, and conveyed to the towns and villages, to be burnt in lamps, &c., instead of oil; it is also used medicinally both externally and internally, in rheumatic and other chronic complaints. It is found pure in several parts of Italy.

2nd, Petroleum, or rock or stone oil, is of a blackish or reddish brown colour. It is fluid, but somewhat viscid, and almost opaque, exhaling a strong bituminous smell. Its taste is pungent and acid; its specific gravity 0.747 to 0.854. It may be rectified by distillation with water, in which process the carbon, which thickens and colours it, is left behind in the retort, and a colourless fluid comes over, possessed of all the properties of naphtha. When petroleum is distilled *pure*, there first arises some naphtha, then a watery empyreumatic acid, and lastly a thick dark-coloured oil, a spongy coal remaining in the retort. In its combinations with and chemical union upon other substances, it perfectly resembles the preceding species. It is found wherever naphtha is, and in many other places among stratified mountains, in the vicinity of coal. In England, Colebrook Dale and other parts of Shropshire are the principal places where petroleum is found. In some of these, extensive strata of sand-stone are saturated with it, and the naphtha procured by distillation of the stone was formerly sold under the name of "Beton's British oil," and was esteemed an active remedy in sprains and rheumatism.

3rd, Mineral-tar differs from the foregoing only in degree.

It is more viscid, opaque, of a darker colour, and leaves a larger carbonaceous residue. It is found in nature together with petroleum, and may also be procured by distillation from coal.

4th, Mineral pitch is similar in external appearance to common pitch. When heated, it emits a strong unpleasant odour. In cold weather it may be broken, and exhibits a vitreous lustre; but when warm, it is soft and tenacious.

5th, Asphaltum: The colour of this substance is brown, or brownish black. It is light and brittle. When broken it displays a conchoidal fracture and vitreous lustre. It has little or no odour, unless it is rubbed or heated. It is considerably inflammable, melts easily, and burns away without leaving any residue in the retort. It is principally found on the shores of the Dead Sea in Syria, and in the island of Trinidad in the West Indies.

II. *Elastic Bitumen.*—1st, Mineral caoutchouc in colour varies from yellowish brown to olive brown, and blackish or reddish brown. The light coloured is often in a semi-fluid state, and adheres to the fingers; the olive brown is elastic and solid; the blackish and reddish browns are hard, and have little elasticity. It is found in a stalactical form, or in masses. Its specific gravity, in the softest varieties, is about 0.9, and in the hardest and least elastic 1.2. It passes into asphaltum, and is partly soluble in sulphuric ether. But the residue of the solution, after evaporation of the ether, is not elastic, thus forming an essential difference between the vegetable and mineral caoutchouc. This singular material has hitherto been found only in the cavities of a lead mine near Castleton in Derbyshire, called the "Odin mine," accompanied with asphaltum.

2nd, Suberiform caoutchouc: When recently cut, it resembles firm close cork in its colour and texture; but, by exposure for a few days to the air, it becomes of a pale reddish brown colour. It is also sometimes found friable, and passes by decomposition into an ochreous powder. It has only been found in a rivulet near the Odin mine, whence the preceding is obtained, and appears to differ from it merely by being penetrated by water. It occurs in nodules of various sizes, some weighing upwards of 13 lbs., the nucleus of which is very commonly the brown perfectly elastic mineral caoutchouc.*

Of these different substances, petroleum is the most important and the most abundant in those parts where it is found. Thus, in the Birmese Empire, it is so plentiful that in one mountainous district five hundred wells have been sunk, from which 400,000 hogsheads are obtained annually. It was formerly exported from thence to the United Kingdom in the crude state; but lately an English company was established in India for the rectification of the oil, which is now brought over in a pure state, by which a considerable saving of carriage is effected. The quantity from this source will probably increase; but the distance must cause the freight to be very high, probably too much so to compete with the United States, whence an equally abundant supply can be obtained, an account of which we shall now proceed to give.

The districts of the United States, in which the greatest supplies of petroleum are obtained, are the western part of Pennsylvania, Western Virginia, and Eastern Ohio; but, recently, oil-mills have been sunk in the States of New York and Michigan, and also in Canada. The most productive are those in Venango, Crawford, and Warren counties in Western Pennsylvania, through which flows the stream now called "Oil Creek," which has become celebrated as the site of the richest oil-producing region at present known in the world. It is a meandering mountain stream, that takes its rise in the northern part of the State of Pennsylvania, near the south line of Erie county, and with its tributaries waters Crawford and Warren counties. After a course of about thirty miles it unites with the Allegany river, seven miles from the town of Franklin. "The valley through which Oil Creek takes its

* The account of these different species of bitumen is chiefly taken from Rees' Encyclopædia.

course," says the account from which we derive our information, "is narrow, and flanked on each side by high and rugged hills, on the top of which are broad fields of excellent farming land. The scenery on Oil Creek at one time no doubt was quite picturesque; but now, the bottom lands are dotted with tall derricks, wooden engine houses, and iron smoke-stacks, out of which columns of black smoke roll upwards to the clouds. The pines and hemlocks are cleared from the mountain sides, and all is busy life."²

This entire region was formerly the great source from whence the valley of Ohio and Mississippi obtained their chief supplies of lumber, or timber. In the spring of the year, when the mountain streams were swollen by the melted snow and ice, thousands of long rafts were sent down by them into the Ohio and Mississippi rivers, after passing through the saw-mills on Oil Creek, near Titusville, by which they were in some measure "licked into shape." It was near these mills oil first made its appearance in large quantities, so that Titusville has unwittingly become the "metropolis of Petrolia," the population having increased from 150 to 3,000. About half-a-mile below it, Oil Creek meets its principal affluent, Pine-creek, now better known as the "east branch of Oil Creek"; and it is remarkable that the *delta* formed by the union of these two streams is covered with old oil-pits, supposed by some to have been the work of the French settlers about the middle of the last century, situated, as they are, between the French forts of *La Bourf* and *Venango*; but the writer of the account believes that they were constructed by the Indians before the appearance of the white man in that region; and this opinion is sustained by the following circumstance: In sinking a well recently in the neighbourhood of Titusville, five feet beneath a spot where a tree stood was found a wooden well-curb, or mouth of an old oil-pit, in a good state of preservation. By the rings of the tree it must have been two hundred and forty years old, which fixes a date for the well far anterior to the settlement of the French in the vicinity.

The land of this region was the property of the "Holland Company," to whom it was granted for money advanced to Congress during the Revolution. Towards the close of the last century it was divided into lots of four hundred acres, and sold at very low prices. Such was the rush of migration to the west that the Venango region was neglected, and was slowly settled until 1797, when Jonathan Titus and Samuel Kier arrived there. The former purchased a tract of several hundred acres, on which Titusville is built, and part of the land is now vested in the "Titus Estate Petroleum Company," of New York. Petroleum certainly, under the name of "Seneca oil," was early known to the settlers, and was used by them both medicinally and for lighting and lubricating purposes. It was chiefly obtained from two natural springs, one of which was in the immediate neighbourhood of Titusville, and on property now belonging to the "Watson Petroleum Company" of New York. The other spring was on the farm of Hamilton McClintock, within four miles of the mouth of Oil Creek.

The first attempt to collect the oil was made by Dr. Brewer, of the firm of Brewer, Watson, and Co. This, however, only applied to the surface oil, which was absorbed in blankets, from which it was wrung out, and used for lighting the lumber-mills of the region. This was found so useful and cheap that in 1854 a company was formed, and termed "The Pennsylvania Rock-oil Company," being the first oil company ever formed; and prior to the sinking of oil-wells being even thought of, the company purchased 100 acres of land on Oil Creek, below Titusville, for the purpose of collecting the surface oil; but the scheme was soon abandoned, and the company dissolved.

The oil movement remained in abeyance for three years, although Professor Silliman had analyzed the oil, and given a favourable opinion of it. But in the winter of 1857 Colonel Drake arrived at Titusville, and having examined the oil-springs, came to the conclusion that rock-oil could be obtained, like water, by sinking a well. Acting at once on this conviction, he induced James M. Townsend and E. B. Bowditch to join him in taking a lease of the lands of the "Pennsylvania Rock-oil Company" for the term of twenty-five years, for the purpose of boring for oil. With this lease Colonel Drake,

with friends from Connecticut, formed a company called "The Seneca Oil Company," for the purpose of sinking wells under the direction and control of the colonel. In the following spring he removed, with his family, to Titusville, then a village of a hundred and fifty inhabitants. Having made himself acquainted with the subject of boring, he procured a man from the salt-springs on the Alleghany Mountains; but the man failed to keep his engagement, and a whole year was lost before he could procure another, and commence operations. After encountering many obstructions and disappointments, chiefly from the caving-in of the side-earth of the well, he had recourse to boring; and on the 29th August, 1859, at the depth of 69 feet 6 inches, he struck a vein of oil, from which he soon pumped at the rate of from thirty-five to forty barrels per day. This was the first petroleum that was ever obtained by boring.

The excitement occasioned by Drake's success was only second to that of the discovery of the gold-fields of California and Australia. Thousands of speculators poured into the district from the neighbouring States—merchants, lawyers, farmers, even preachers, abandoning their callings, rushed to the oil region and purchased or hired land, which rose in value to fabulous prices. The firm of Brewer, Watson, and Co., already referred to, took a lease of the farm of Hamilton M. Clintock, and commenced sinking a well, which found oil at the depth of seventy feet. Many other wells were sunk on different farms, and the whole district became studded with derricks and buildings suitable for the operations. The produce of these, however, though remunerating, was as nothing compared with one sunk in 1861 by A. B. Funk, which at the depth of 470 feet struck a reservoir, from which flowed spontaneously a stream or fountain of petroleum; others now adopted the plan, and one well on the Buchanan farm yielded, without pumping, one thousand barrels per day. Then comes the Empire well, pouring out 3,000 bbls. per day; next the Sherman well, in April, 1862; and the next year the "Noble and Delemare" well, which, after having been bored 167 feet, was abandoned. But soon after the proprietor, Mr. Noble, recommenced the work, and bored to the depth of 471 feet, when to his astonishment, the petroleum began to flow copiously, and yielded a rich return for the labour bestowed upon it.

This discovery of "flowing wells" produced such an abundance of the material that pumping was abandoned as unprofitable. The reader will be able to form some idea of the quantity of petroleum obtained, from the fact that the firm of Brewer, Watson, and Co. expended 750,000 dollars for barrels alone before they had realized any profit. They were, in fact, the pioneers in the movement, and, in the end, reaped an abundant harvest from their efforts. At their establishment at New York they made great exertions to introduce the article to general consumption. This required much time and labour, and before it was accomplished the price of the article fell so low as from 10 to 50 cents per bbl., (or from 5d. to 2s. 1d.), and a large quantity was allowed to run into the creek, the owners not being willing to expend money for barrels to receive it.

The first person who attempted to refine the crude oil was Samuel M. Kier, of Pittsburg. This was an important discovery, and was immediately adopted by W. H. Abbott, of Titusville, who erected the first large refinery at that city. There being at that time no railroads to the works, the iron required was conveyed in waggons through roads axle-deep in mud; and so disheartened were the parties concerned that they would have abandoned the enterprise, but for the energy of Abbott, who persevered till the building was completed.

An unfortunate accident occurred soon after the discovery of the flowing wells. From some unknown cause, the oil at the "Brown Well" took fire, "and," as described by an eye-witness, "columns of black smoke rolled upwards into the air, the blazing oil leaped heavenward, and, falling over on all sides from the fiery jet, formed a magnificent fountain of liquid fire. The sight was awfully grand; but sad to relate, nineteen persons were burned to death. Among them was Mr. Rouse, one of the proprietors of the well. He lived for several days after being injured; and in framing his will, after making certain bequests, left to the county of Warren a handsome sum, to be applied, one-half for road purposes, and one-half to the poor of the county. This bequest is now valued at 150,000 dollars, or £30,000 sterling.

The low price of petroleum, consequent on the enormous

² Harper's New Monthly Magazine, p. 563.

supply suddenly obtained before a regular or adequate demand existed, produced the natural effect of causing a suspension of the works, and in most cases the abandonment of the wells altogether. The "oil bubble," as it was termed, was said to be exploded, to the great delight of those prophets whose predictions on such occasions are "always of evil and never of good," and who always rejoice in their fulfillment, whatever suffering it entails. It was, however, but for a short time; for very soon a demand sprung up for petroleum for lighting purposes, and it came into universal use, as unequalled for cheapness and purity of flame. Again thousands of speculators poured into the "oil region," in which refineries sprung up as if by magic, and all was activity and excitement. Railroads were laid down, fresh lands were leased at high rates. Tow-boats laden with barrels, full or empty, were constantly plying to and fro. Farming was abandoned, villages suddenly grew into populous towns, and the whole face of the country became one scene of bustle and activity. The following description of the oil-region at the opening of the present year will, we trust, be interesting to the reader.

Titusville is situated at the head of Oil Creek, and in Crawford County, Pennsylvania. Previous to the discovery of the oil fountains, the only trade of the place was in timber, which was then sold at from five to ten dollars per thousand feet for the best qualities. It is now worth from twenty-five to fifty dollars, and the demand is greater than the supply. The number of houses is more than one thousand. The imports of merchandise by rail in 1863 was 70,000 tons; and the exports of oil 750,000 barrels. It is estimated that in this year (1865) the entire exports from Titusville will amount to 18,000,000 dollars, or £3,600,000 sterling. The wooden buildings are giving place to stone and brick, and building-lots are selling at from 1,200 to 1,800 dollars per lot.

The bottom lands below Titusville consist of a rich tract, on which flowing wells are situated; and the oil from them is said to be of a superior quality. It is supposed that by sinking to the depth of 1,200 feet a larger flow of oil than any yet discovered will be reached; but this is at present only conjecture. Wells are now sunk along the entire line of Oil Creek, north of Titusville. A railroad has been constructed as a branch from the Great Western and Atlantic Railroad. It passes through Titusville to the Schaeffer Farm, which is mid-way between Titusville and the Oil City, or about seven miles from each. The railroad is about to be continued to this latter place, which is situated at the base of a mountain, and at the mouth of Oil Creek. It consists of only one street, and being confined within a narrow space can never become a large town. There are five or six hotels in the place, which are usually filled with strangers, looking out for lots on which to build houses or sink wells. Besides Oil City, several other towns have sprung up in the oil region, as Funkville, Petroleum Centre, and McClintockville. This latter is situated on the McClintock Farm, the mills on which belong to the McClintock Petroleum Company of Philadelphia. About seven miles below Oil City, and at the confluence of French Creek with the Alleghany River, is the town of Franklin. It is situated in Venango County, and is the terminus of the Atlantic and Western Railroad. It is a place of considerable trade, and thousands of barrels of petroleum are shipped or sent per rail from thence. French Creek is a large stream here; it rises in the southern part of New York, and running nearly parallel with Oil Creek, empties itself into the Alleghany River. Its banks are studded with derricks, indicating the existence of wells along its course.

Oil is found in large quantities on both banks of the Alleghany river for twenty miles above Oil City. The most celebrated are the Economite wells; but others are now being worked equal in yield, and the land is fast letting or selling at very high prices. Most of the wells are flowing over, and require no pumping. The town of Tideoute, in Warren County, receives part of the produce of these wells, and ships it by the Alleghany River, on the west bank of which it stands. Another portion is taken in tow-boats to Irvine, fourteen miles above Tideoute. These boats are drawn by horses, and carry from 150 to 200 barrels of oil each. The horses often cross and re-cross, and sometimes draw up the centre of the river against the stream. Chery-run is another river on which oil is found in large quantities. The great Reel Well on this stream yields 280 barrels of oil daily: and the land on the

banks of this and some neighbouring rivers has been purchased at very high prices. Hundreds of wells are being sunk or bored on the sides of these streams. In short, the entire counties of Venango, Warren, and Crawford, are now being prospected for oil; and one cannot traverse the country in any direction without meeting with parties seeking new oil-lands.

Refineries for purifying the petroleum are rising up everywhere, and great improvements have been made in the mode of distilling the oil. The largest establishment for the purpose is at Corry, in Crawford County, Pennsylvania. It is a brick building, and cost, with the machinery, 150,000 dollars, and employs upwards of 200 workmen daily, requiring 300 barrels of crude oil daily to supply it.

Virginia has its oil region, comprising the counties of Pleasants, Richie, Wood, and Wirt. Ohio also has numerous territories in which oil is found. On the Cow-neck Creek in Virginia the Jackson and Pedro Well was sunk to the depth of 587 feet, when a reservoir of oil was struck, from which flowed at first 1,000 barrels of oil daily, of a fine illuminating quality. Another on the Horse-neck Creek yielded an equal quantity for a short time, but fell off. The Gilfillen Well, on the same stream, 250 feet deep, gave 500 barrels daily, another 700, and many others on the Canawha yielded from 25 to 1,000 barrels. The Ohio oil-region has not hitherto been much explored, but it is beginning to attract attention. The New York and Ohio Petroleum Company has recently purchased about 5,000 acres, and have begun sinking wells upon it. So important and established have these companies become, that an agency for those in Pennsylvania named the Connate, the Cybele, the Ceres, the Themis, the Astrea, and the Nemesis combined, has been appointed in France (Paris), the announcement of which sets forth that 26 millions of francs of capital is to be invested in them, and 12,000 acres of land have been purchased on their united account in the oil region.

The depth to which these wells have at present been sunk or bored is from 100 to 1,100 feet; but there is reason to think that, at a much greater depth, there is a reservoir of petroleum, compared with which the quantities hitherto obtained are but dribblets. How far this opinion may be borne out, remains to be seen. Certain it is that the deeper the engineers have gone, the greater has been the flow of the petroleum. In fact, it has only been by deep boring that a "flowing well" has been obtained, by striking a considerable reservoir or "vein" of oil. In most cases, however, the pressure of gas is not great enough to force up the oil, without the aid of a pump. Even those which flow vigorously for some weeks have in many cases declined in power of flowing, rendering the use of the pump necessary.

The mode of sinking a petroleum well is thus described by an American writer in Harper's Magazine: "After the spot has been decided upon, which is in most cases in the lower bottom-lands, a stake is driven into the ground at the spot where the bore is to be commenced. A derrick is built, from twelve to sixteen feet square at the base, and about forty feet in height, running to a point at the top. The engine-house is erected, and the necessary machinery made ready within. Sections of iron pipe, six inches in diameter, are then driven into the ground by means of a pile-driver, until the first layer of rock is reached, which, in most cases, is found at the depth of thirty-five or forty feet below the surface of the ground. Great care is taken that this iron pipe is driven plumb. After the rock is reached, and the earth in the pipe removed, a block-and-tackle is rigged at the top of the derrick, and the drilling-tools, weighing in some cases 900 lbs., are hoisted up and dropped into the driving-pipe down to the rock. A temper-screw is then attached to the top of the drill by means of a rope, and made fast to the end of a walking-beam. This is a heavy horizontal piece of timber, supported in the centre by a Samson-post. The other end of the walking-beam is connected with the driving-pulley by means of a crank. The engine drives the pulley, the end of the walking-beam rises and falls; and thus the drill is raised or lowered at will. At intervals, during the process of drilling, a tool, called a 'reamer,' is inserted in the well, and the bore is increased to the proper size. A 'sand-pump' is a metal case from five to ten feet in length, constructed with a valve at the bottom. This sand-pump is lowered into the well at intervals, and when it reaches the bottom the valve opens and admits the borings, and when the pump is raised the valve closes, and the contents are brought to the surface. After the

bore is thus cleansed, the drill is once more inserted and the drilling is continued." A journal is kept, showing the different kinds of rock and earth passed through, and the exact points where watercourses, gas, or shows of oil are found. If a large vein of oil is struck, the well is immediately tubed with a 2 or 2½ inch iron pipe, put together in sections. The trucks or tubs that receive the oil are mostly of wooden staves, and are placed at some distance from the well, but are connected with the pump by an iron tube attached to the spout, conveying the oil to the tank. The expense of sinking a well ranges from 2 to 3½ dollars per foot. A well complete, including all necessaries, is estimated to cost between five and six thousand dollars."

The largest flow of oil has been obtained by sinking below the third sandstone, which, however, is found at various depths, and, in some instances, has not been reached at all. It is supposed that the "great basins" lie at the depth of from 1,500 to 3,000 feet, at which a perennial supply, it is supposed, would continue to flow. It is the opinion of geologists that the formation of petroleum is constantly going on in the laboratories of nature, and that immense quantities of carburetted hydrogen gas, which accompanies the oil, are evolved in its formation; and that were it not constantly forming, the escape of that which exists would soon exhaust the supply, by which the pressure no longer operates to produce the flowing wells. Every theory, however, relating to the interior of the earth below the depth already reached is mere conjecture, founded, it is true, on analogy and observation, but liable to be upset by actual experience. One thing appears to be established to a certainty—that the basis of petroleum is coal;

and, probably, coal of a certain description differing from that which is found in England generally, because no petroleum is procured in any of our northern coalpits, although sunk to a much greater depth than any of the oil mills in America. It is, we think, probably the product of a species of coal richer in oleaginous or other inflammable matters than common coal more tender, and more easily acted upon by the natural heat of the earth, by which it becomes semi-liquified. This supposition is founded upon the fact that in New Brunswick, previous to the discoveries of petroleum in Pennsylvania, a company was formed for the purpose of distilling oil from *canise coal*, which is found in that province in great abundance. This species of coal answers the description we suppose to be applicable to that from which the petroleum of Pennsylvania and other of the United States is produced. The "New Brunswick Oil-works Company," as the establishment is called, was conducted with great success, until the discoveries in the United States; after which, as the New Brunswick oil was obtained by distillation direct from the coal, it could not for the moment withstand the competition. Latterly, however, the works have been resumed with great credit and success. We happen to know this from the circumstance that a relative of our own, who held a number of shares, which he had laid aside amongst his bad debts, has recently and most unexpectedly received a handsome dividend upon them. We have referred to this case as pointing to cannel coal, which is the most inflammable species of that mineral we are acquainted with, as at least possessing a large share of those properties requisite for the production of petroleum.

THE OLD NORFOLK FARMER.

THE ESSEX STEAM PLOUGH;

OR,

OSBORN'S SYSTEM OF RIGGER HAULAGE.

Justice has been but somewhat tardily meted out to our West India planters McRae and Osborn, for what they have done in advancing the cause of steam culture. This we believe mainly arises from the fact that the propositions of both patentees were differently reduced to practice from what they are described and illustrated in their specifications and drawings. On entering the experimental grounds, the former (McRae) found that his project was subject to many cardinal alterations before it came up to the demands of practice, and as soon as these improvements were made, and their efficacy tested in the field, his engine and implement were immediately shipped from Glasgow to British Guiana. The other's (Osborn's) engines, &c., were shipped from London under somewhat similar circumstances; so that the British farmer Scotch and English, hardly had time to ruminate on who, some few of their numbers only had imperfectly seen; consequently neither could arrive at a practical conclusion. Indeed, so slight and imperfect were the impressions left upon the public mind in both cases, as to the mechanical details of the two implements, and methods of hauling, that almost every vestige of them was obliterated before the Chelmsford Meeting of 1856, when steam ploughing was for the second time introduced into Essex. At this latter period (1856) it was acknowledged one of the greatest modern improvements, in the estimation not only of the competitors for the prize offered by the Royal Agricultural Society of England, but also of the generality of spectators; but so completely was the former effaced, that hardly a single individual was present who could give any mechanical account of the first steam plough, all that remained being a faint recollection that something of the kind had been made; but its inventor, construction, and merits were questions upon which not a shadow existed in 1856 capable of leading to their practical solution. Fortunately the Glasgow and London newspapers recorded at the time the trial, experiments made, and also the manufacturers of the engines, &c., and to these sources we can yet apply for information.

The report referred to above, relative to Osborn's steam plough, will be found in the *Mining Journal* of October 14, 1848, page 486, from which it is quoted in the January num-

ber of the *Farmer's Magazine* for 1849, pp. 47 and 48. Both reports are illustrated, showing the rigger method of haulage. There were two engines in the system. These were manufactured by Mr. Wm. Curwood, engineer, Whitechapel; and the experimental trials were made on the farm of Mr. Tyler, near Stratford, Essex.

Osborn's method of haulage is on the rigger principle, as previously carried out by the other West India example (McRae's), and subsequently by the late Mr. Fowler, but differing in the details of mechanism from either; and also from the prior examples of Pratt, 1810; Chapman and Chapman, 1812; Saxton, 1832; Pinkus, 1839; Clausen, 1846; and those of a subsequent date, viz., Beadon and Smith, 1847; Sir J. S. Lillie, 1847; Arnoux, 1853; and Fiske and Fiske, 1855.

Osborn's tackle consisted of two vertical-grooved riggers working in framing fixed by straps to the side of the boiler plate, the one over the other, so that in going round these the wire rope formed the figure 8. From the bottom of the lower rigger the two portions of the rope were taken off tangentially by means of two small horizontal pulleys or friction wheels, and from which they passed to the opposite engine, or to an anchored snatch-block at the opposite headland, where only one engine was used, and at any desired angle required, the two ends of the wire rope being attached to the implement between, or the four ends of the two ropes to two implements between, where two engines and two implements were used. Motion was communicated to the lower rigger by means of gearing from the end of the crank shaft, which latter was situated below the boiler.

There were two engines of 10-horse power each, with vertical cylinders housed in the smoke box, motion being communicated to the crank shafts below the boilers, on the old plan of beams and side rods. They were rendered self-locomotive by means of "stubb-wheels and chains connecting them with the crank-shaft."

The trial experiments on Mr. Tyler's farm were made both with two engines, the one opposite the other, and also with one engine, the rope passing round an anchored snatch-block at the headland opposite. The distance between the canals in

British Guiana, where the engines were intended to work, being only from 240 feet to 360 feet, they in the first trial were only placed 120 yards asunder; but in subsequent trials this distance between them was increased to 210 yards, and also between the single engine and anchored pulley. The implements used were one of Lowcock's two-way ploughs, a Kentish turn-wrest, and an Essex two-wheeled plough.

The first trial with a Lowcock plough is reported a failure, owing to the draught not being adapted for steam power; but the second and subsequent trials are acknowledged successful. At this time, Osborn's own implements, those covered by his patent, do not appear to have been made: at least no notice is taken of them in the report. In point of fact, the two long implements specified as designed for crossing the open ditches in the low-lying plantation grounds of British Guiana were not suited for the land in Essex—a very good reason for not bringing them to the trial ground; and the other implement specified by Osborn appears as if it were the one at that time in use by Alexander M'Rae, Esq., on his plantation, and noticed by Leonard Wray, Esq., in his "Sugar Planter's Guide," published by Smith and Elder, Cornhill, in 1848, or before Osborn's experiments were made as above.

Such is a general outline of the first experiment of steam ploughing in Essex, and although highly successful and satisfactory in one sense, it nevertheless neither does justice to the subject nor Osborn's system of steam culture. In point of mechanism, as a question of science in the march of improvement, there is something so mysterious about the latter, Osborn's system of steam culture, that it requires clearing up, for the reporter to the *Mining Journal* states, doubtless on the authority of the patentee then in London, and no doubt present at the trial, that "the mode for taking up the wire rope constitutes the patent," *i. e.*, the rigger system of haulage; whereas in the specification and claims of the patentee, not a word is said about rigger haulage; on the contrary, two vertical winding drums are specified in the letterpress, and delineated in the drawings. Thus, quoting from the Patent Office "Abridgements of Specifications," "each engine carries two drums on the side nearest to the other engine, and to these drums are attached chains or ropes, by which two four-wheeled carriages, fitted with ploughs or other implements, are simultaneously drawn across the field in opposite directions, each carriage pulling after it the rope or chain by which it is to be drawn back again. Thus, while one drum on each engine is at work winding up its rope, and so putting the ploughs or other implements in motion, the other drum is delivering out its rope in readiness for the return operation."

Inventors, when they enter the Patent Office, sometimes find themselves anticipated in part of their discoveries; at other times, different projects are so similar in character that they are obliged either to confine their claims within a narrower compass than they had intended, or else to allow prior applicants to "specify out" before they give in their final claims, which sometimes necessitates a second patent. This was more especially the case under the old patent law, which allowed a wider field to grasping claimants than the present statute does. Something of this kind appears to have been experienced by both M'Rae and Osborn. In other words, they had each two ways of carrying out their projects, but were obliged to confine their claims to one, leaving the other for a second patent, provided it was not included in the claims of a prior patentee. Indeed, on the part of Osborn this is manifest, for we find his patent-agents took out a patent of the same date as his own for a plan of rigger haulage, Clausen's patent No. 11,303 and Osborn's patent No. 11,304 being both dated July 23rd, 1846, and taken out by the Messrs. Robertson and Brooman, 166, Fleet-street. There is something so singularly interesting in this, more especially when Clausen's specifications and drawings are examined and compared with Osborn's project as reduced to practice, that we have thought it worth while drawing the reader's special attention to it, as a question in the march of progress in connection with the working and operation of our Patent Laws; for had it not been for the extra expense, Osborn would doubtless have had a second patent; and unreasonable as the expense of patents then was, it is probable that he would have secured the whole of his project by a second patent had he received greater encouragement so to do from English farmers, canal owners, &c. Hence the *rationale* of the statement in the report of the *Mining Journal* already quoted, for the claims in the second patent would have then

been those referred to, *viz.*, "the rigger system of haulage," or "the mode of taking up the wire rope" as applied to steam culture, and canal and road haulage.

But be these hypotheses, contained in the preceding paragraph, as they may, one thing is manifest, *viz.*, that to Osborn belongs the merit of having first reduced to practice the plan of putting the rope round the riggers in the form of the figure "S," so as to give it bite, and avoid the excessive abrasion and tear and wear upon it experienced under the other West India rigger system, that of M'Rae, who put his rope twice, or a sufficient number of times, round the barrel of his rigger to make it bite. The objections to this latter system of yoking the wire rope are too manifest to require pointing out, as are also those of the former, but the odds are greatly in favour of Osborn's plan.

In the construction of his riggers and friction pulleys it must be observed that Osborn fell into an egregious mistake, one into which all his successors who have adopted the rigger principle of haulage have fallen, *viz.*, that of making them of too small a diameter: the former (the riggers) being only 30 inches. This may be pardonable in the outset, but it is the utmost that can be pleaded, even in behalf of a practical man. It was doubtless much against the success of the trial experiments made on Mr. Tyler's farm, and still more against the durability of the wire rope under continuous use in British Guiana. But mistakes of this kind, although they often militate greatly against the successful introduction of a new project, only apply to the construction, and not to the principle upon which any peculiar mechanism is based. The report of the trial experiments made in the mother-country speaks favourably both as to the bite of the rope upon the riggers, and its general freedom from abrasion; the fact that the experiments were most successfully made when working with the greatest length of rope is conclusive under the former head—bite; while the tangential method of taking off and leading on the rope from and upon the vertical riggers by two horizontal friction wheels, was calculated to reduce the amount of abrasion to a minimum. In this latter respect we aver Osborn's system of friction wheels or riggers is free from objection than any of his successors' methods that have yet been reduced to practice.

It also appears, from the report of the *Mining Journal*, that Mr. Osborn contemplated steam haulage both in the canals of British Guiana and also on land, by working his rigger system along an anchored wire-rope. In the former, canal haulage, this would be effected simply by placing his engine longitudinally in a punt. According to the report, two wire ropes were to be anchored in the canal, one on each side for the up and down traffic, the two engines in the two punts thus acting as two steam tugs, each hauling a fleet of barges after it, the one fleet on the right side, and the other on the left side, the two plying in opposite directions. In the latter case, rigger traction on land would be performed on similar principles, as the engine, in working itself along an anchored rope, would haul two or more waggons after it, the principle being similar to Chapman's plan.

Although in both these propositions Osborn was anticipated by prior patentees, in a manner which he probably was not aware of when he applied to his patent-agents in London, yet his plan involves improvements upon them which might have been patented after one of them, *viz.*, Clausen's already referred to, had been specified and out of the way. This, at the time his engines were manufactured, was the case, the ground then being clear; and it is possible, as formerly hinted, that a second patent would have been applied for had he received in this country sufficient encouragement from farmers and canal owners to justify the heavy expense which patents then incurred. But at that time the agricultural mind was looking in a different direction for the practical solution of the problem of steam culture, *i. e.*, rotary action, while the general body of the public was literally "railway mad," and bent upon filling up every canal in the kingdom with the least possible delay. Hence the upshot, no second patent, and only but a faint recollection left of Osborn's method of rigger haulage, there being not one in a thousand who knew anything about it at the Chelmsford meeting of the Royal Agricultural Society in 1856. His plan of using two engines also merits special notice, for although the mode described in his specification is the working of two implements on the old ridge and fallow system, yet he also specifies the working of one-way implements, which anticipates some of our modern discoveries.

CATTLE VERSUS CORN AND MALT.

At a late meeting of the Dorchester Farmers' Club, the following lecture was delivered by Mr. DAMEN:— In introducing the subject this evening, I cannot but fear that I shall not interest you to the extent I should wish to do upon occasions of this kind, but I am sure you will take the will for the deed. The subject of my lecture is "Cattle *versus* Corn and Malt." In the first place it may be supposed that I should attempt to show the relative advantages of feeding cattle and of growing corn; but such is not my intention for a moment. It would be presumptuous on my part, in the presence of so many practical men, to attempt to prove that you could gain more by one system than another, therefore I shall not argue the question in this way. I shall rather demonstrate to you the fallacy of the advice given by many people—members of Parliament and others—at agricultural meetings, and indeed by all classes of the community, since the advent of free trade, that it would be desirable for you to fatten cattle instead of growing corn. It is my wish to show you that the effect of acting upon such advice would not be at all to your interest or to the general advantage of the people. And first, I believe, the price of meat, if you acted on that principle, would be so reduced that you would fail in the object you had in view. Therefore I am anxious to show you that it would be a mistake to follow such advice. I must endeavour afterwards to point out to you that it is more the duty of county members to support your interests in the House of Commons than to give suggestions of that kind. Especially, gentlemen, shall I show you in the latter part of my remarks that in reference to the malt tax their duty towards you is quite of a different character. You are all aware that in the advice they offer you from time to time they cannot understand as well as you yourselves that respecting your individual pursuits you should be better judges than they as to whether or not it would be preferable to fatten cattle rather than to grow corn. I desire in the first place to draw your attention to some remarks of a gentleman who is an eminent member of an adjoining county—Sir Lawrence Park, in Devonshire, who, after making a good speech, said, "The long and short of what I would impress on the agriculturists is that they must look for the future more to producing good beef and mutton than to growing cereal crops." Now, gentlemen, you know, as men of business, that price must depend upon supply and demand. If you produce a larger quantity, price must lower in consequence. The price of meat for some years past, as you are aware, has been, as I may say, the sheet anchor of the farmer. But, gentlemen, the demand has been met by the producers of meat. Although the price has been high, and I admit has been remunerative, it has been met by you; for we must not forget the expensive means that have been used in fattening those cattle, and those enterprising men who have done so have only met a fair return for it. I wish, therefore, to show you, if the advice of Sir Lawrence Park and other gentlemen could be acted upon, what would be the effect. The answer seems to me to be a common-sense one. The price of meat must be reduced, and that to the extent of say 1d. or 2d. per lb. I believe myself most firmly that it would convert the present fair profit into a positive loss (Hear, hear). Some have contended that the increased supply would be met by increased consumption; but it is quite evident that unless you can reduce the price of meat you cannot increase the consumption—not on an equal ratio, to say the least of it. And not only that, the price of meat must be governed by the consuming capabilities of the people. If it was possible, for instance, to get meat up to 1s. per lb., I would ask you if the great price would not in a very short time be reduced in consequence of people not being able to buy meat at such a rate? Therefore, in occasioning less consumption, the ease would cure itself. We know, too, that if it were possible to raise the wages of the labourers and artisans of this country to the extent of twenty-five or thirty per cent., it is quite possible the price of meat, butter, and cheese would rise in proportion, and wages would rise in proportion; but wages, like everything else, are a marketable article, and you cannot raise the price of wages with

any view to their being marketable articles. Therefore it would take years to increase the price of wages. I have no doubt myself that in the course of years wages will so advance in this country, if we continue prosperous, that the price of meat and produce will increase in value in proportion as wages increase; for you will find the artisan-labouring classes of this country do not work to save, but to live, and live well if they can. Therefore it is only a question of time, but it must be a long time before any revolution of that kind can take place. In reference to the price of meat, let me call your attention to the report of a committee of the House of Commons that sat in 1834 or 1835 to inquire into the agricultural distress at that time prevailing. Before that committee some eminent farmers—some of the best in the eastern counties—gave evidence, and their evidence went to show that they were in the habit of stall-feeding largely, but that they had to meet a loss on the animals they sold. Their evidence was corroborated fully by each other that the loss on these animals so fed amounted to £1 or £2 per head each, and they gave them roots into the bargain. This was at a time when meat was only 6d. per lb. You will agree with me that in fattening meat at 6d. per lb. your loss would be something like it, but you would sacrifice your roots also in feeding animals. But these gentlemen contended that, notwithstanding the loss they sustained on feeding the animals to supply the markets at such a price, they regained their profit by what they called the value of the "muck" or manure which they produced. Now, gentlemen, muck of itself will not pay rent, however pretty the muck that can be made of it. Fattening must be followed by corn. Every practical farmer knows the necessity of a rotation of crops. Growing roots alone (as many contend we should) could never repay him. You cannot afford to sacrifice—as the Norfolk farmer contended he could do—his crops for the sake of the corn and muck that was to follow them, for that, as reasonable men, you know, must depend upon the value of the produce hereafter. Now, gentlemen, let me endeavour to show you the effect of depending on foreign supplies of corn to feed the masses of this populous country. I must first call your attention to the relative supplies of foreign and British produce. Since free trade became the law of this country, during the first twelve years we imported, in round numbers, about 5,000,000 qrs. of wheat per annum. But from 1860 (when the worst crops were grown in England that had been known for a half century) to 1863 we imported 10,000,000 qrs. of wheat per annum, or about sufficient to feed half the population of this country. It is strange to say, too, that during those years prices were reduced, and went down 25 per cent.; but this, I believe, was more in consequence of the American war than from any other cause. They sent us their corn as being the only country which could receive it and pay them their money, and from the effect of their own necessities. But, gentlemen, I shall now suppose, for instance, that we should unfortunately be engaged in a war with that country, and that the supply of corn should cease. What would be the consequences? If we should be, as well, engaged in a war with our near neighbour—that great naval and military country—what would be the effect on the price of corn? People argue that war has ceased—that we are so civilized that war is almost impossible. But the history of the past is the best criterion for the future. You will find we have had before as long an interval of peace, and it was followed by war. As an Englishman, I cannot help looking with some alarm at the great preparations for war which are now being made in this and other countries. Sooner or later war must come, therefore I believe most sincerely it is the duty of a paternal government to protect agriculture, and do all they possibly can to promote the growth of food for the people of this country; because, whenever war comes—for come it will, God knows how soon—the greatest question of the day will be, the feeding question—the feeding of the people. If we have depended on foreign countries for one quarter or one-half of the food of the people, I would say this—that it is the absolute duty of the Legislature to promote in every possible way this branch of agriculture. We all

know, gentlemen, what effect war has upon price: for only in the years 1851-55, during the time of the Russian war—when too we had good crops—prices advanced as far as 80s. to 85s. per quarter, just double those at present, and this whilst we had good crops at home, and this also at a time when we were fighting happily, not against, but with France—when France and England were mistresses of the seas of the world; when there was no one to compete with, and so far as regards our importations there was nothing whatever to prevent it. But even at that time, with good root crops, wheat was selling at 50s. to 55s. per quarter. What would be the effect in the event of a great war unfortunately rising? It may happen that that greater country may fight against us, instead of with us. Therefore, again I say it is the positive duty of the Legislature of this country to protect and encourage the home produce of the British agriculturist. This, gentlemen, I do not argue more for the sake of the farmer alone than for the community at large. It is a national question, and I do not urge it for the sake of the pecuniary advantage which may arise to the agriculturist; but the supply of the people generally with food of home produce is the main question. Gentlemen, one word with regard to the effect upon agricultural labour, if this insane advice, as I may call it, should be followed. If the foreigner is to feed the people of this country with their bread-food, if the system proposed by some men, not well informed on the subject, should be adopted, that we should almost entirely grow roots instead of corn—which I don't believe possible—the next thing must be that tillage land must be converted into pasturage. Then, I ask, what would be the effect on that deserving class, the agricultural labourer? We all know as practical men that every 100 acres of arable land will find employment for four men. If you convert that land into pasture, one man will do the work of four; therefore, by such a system, you throw out of employment a vast number of men, and unjustly so. Gentlemen, I fear my remarks will now touch a little on politics, in this short address I am giving you—and it shall be very short I promise you. I have endeavoured to show the effect of following Sir L. Palk's advice in this matter: I wish now to show you what should be the duty of County Members upon this question, and with regard to your interests generally. In doing this I do not wish for a moment to leave out of the question the constituencies of county members—you yourselves, gentlemen, and your class generally, especially with regard to the duty your worthy chairman has enlarged upon—the Malt Tax. That forms part of my subject, and you will excuse my entering upon it. With men who have fully made up their minds, I do not intend to argue the question upon all its merits, as I should be wasting your time in doing so. I cannot, however, help saying this, with regard to it: That if any farmer has entertained misgivings previously, I think for the last two or three years he must have begun to see that our demands on that subject are just and reasonable. If he looks at the price of barley he will find that most unremunerative; he will find, however much he will grow, however much he may improve his soil, he will get no corresponding advantage from it. In growing malting barley, for instance; if he grows 20 or 30 less per cent. over the country, he would get a much larger price; but he does not get anything more from this extra quantity. So far as regards the grinding value of the barley, it is quite certain he cannot afford to grow it for grinding purposes. At this moment the inferior grinding barleys of Europe, and Turkey in Asia, can be brought into this country at a much less price than we can grow them. I would be prepared to supply any gentleman in this room grinding barley, weighing 50lbs. a bushel, at a guinea per quarter. I should be happy to take orders for 5,000 or 10,000 quarters of good grinding barley, at a guinea per quarter. If you get a large crop of barley in this country, the brewers positively get all the advantage. The public pay the same price for their beer, and not a farthing less (Hear, hear). If you get a large crop, people get the advantage of cheap bread, which is always a blessing; but whatever the crop of barley, the people never derive any advantage. It all goes into the capacious pocket of the brewer. I don't blame the brewers; but there it will continue to flow, unless you and your representatives in the House of Commons bestir yourselves to alter the system, and you should bestir yourselves to be represented as every other class of the community is represented. If you wish to get the repeal of this tax, don't be satisfied with your members

saying to the Chancellor of the Exchequer, "Oh, Mr. Chancellor, my constituents want the repeal of the Malt-tax, but don't inconvenience yourself about it. I meet them very seldom, only about once a year, at jolly agricultural dinners or at election times—don't inconvenience yourself about it. It is quite true you boasted, Mr. Chancellor, in your speech on the budget last year, that during the last nine years you have taken off taxation to the amount of nine millions a year. But my constituents say they have had no advantage, nothing worth mentioning; but rather their agricultural burdens have increased. I don't know whether 'tis a fact or not, but they say so." That is what such a member would say. Now, gentlemen, I think it is time for you to bestir yourselves and say whether this is fair or not. It is time you should say, "You have taken the duties off tea, sugar, and wine, and paper; but I feel no interest in these things, except in a very small ratio, a very small degree indeed." But, gentlemen, it seems to me you want men, regardless of all party feeling, to demand justice at their hands. I would ask you, gentlemen, is the next great surplus to be frittered away in the same way? Are you to have no benefit from it? It is a question you have to ask yourselves, whether it shall be so or not. According to present appearances, there will be, as has been the case for some time, another great surplus to be disposed of. It will be frittered away as before amongst people that ask for it—amongst people that have the most influence with the Chancellor of the Exchequer and the Government of the day, whatsoever that government may be—this is a matter of course. As I have said before, I do not blame the members more than I blame their constituents respecting this matter. But I would ask you how Manchester would act under similar circumstances. Would they not put themselves in communication with their members; and if those members did not satisfactorily represent their opinions, would they not change them? Most assuredly, yes. But, gentlemen, at Manchester they have Chambers of Commerce. And it is a well-known fact that the Chamber of Commerce at Manchester carried Free Trade, and we give them credit for doing so; but where is the Chamber of Commerce for agriculture? what interest have you? How are you represented in these matters? Gentlemen, I am coming to the pith of the matter; I am coming to the postscript which contains the best part of the letter, as the ladies say. I would suggest, if not Chambers of Commerce, that we should have agricultural boards in this country: that we should put ourselves in communication with our representatives; because they themselves are quite at a loss to know what we require unless we tell them, and I believe no agricultural boards could be so easily formed as those formed by Farmers' Clubs. They are supposed to, and I believe do most thoroughly, represent the agricultural views of the districts in which they are formed. People may sneer and say, "I don't belong to one," but I say plainly they represent their views and opinions in these matters. I see this exemplified in every discussion that is introduced; indeed, I saw it at the last lecture that was so ably given in this room. Many men adopt the opinions enunciated here. Only lately a man said to me, "I shall not do so-and-so until I hear what the lecturer says on the subject." Therefore, however much individuals may keep aloof, and always will keep (for we cannot all be of the same opinion), that we do represent the agricultural opinions in our clubs and districts, I have no doubt whatever; and that we shall continue to do so I have no doubt. And if we are in that position I would ask if we cannot go further, and put ourselves, as time and occasion may require, in communication with our members, and let them know what we want. I believe they would be satisfied equally with ourselves; but they are kept, as a rule—as we should be without such societies as these—in darkness as to our views, because they only get our views and opinions at the after-dinner meeting of some agricultural society; and it is a mere nothing they can get there, whilst we, as agricultural clubs, represent those opinions, and can tell our members what we mean. In speaking of politics, I would say that as regards party politics, I have been a member of various farmers' clubs for a great many years, but I must say that I never heard any subject introduced of a party nature. I believe we have scrupulously avoided party politics, and therefore we have no reason to be afraid of expressing our opinions fearlessly on all subjects that relate to agricultural politics. I know the fashion of the day, gentlemen, is, in a great measure, to ignore

agricultural claims. I do not know why, but such is the case. In the House of Commons, and out of it, we seem to have lost our interest in the body-politic of this country. I believe it most firmly that we have. I would not say the manufacturing interest has no claims: it has exercised its wisdom, I will call it, in advancing its own claims and objects before the powers that be in this country. They have indeed been heard, whilst we have not, however just our claims may have been; but this is no reason why we should not insist upon justice on our side: we ask for nothing more. You are aware that in France, gentlemen, the Government seems especially to take care of its agricultural interest—that they have a Minister especially devoted to the interests of its agriculture; and you may have seen, as I have seen within the last few days, a circular (and a very sensible one too) addressed to the people of France in reference to agriculture. The agriculturists of France complain that prices are so low that they are losing their money; and you know if men lose their money they squeak, in any part of the world. They blame their legislature first, in a very sensible way. This Minister of Agriculture replies, "It is not so. It may be from your good crops, or the good crops of England. The facts with regard to France are these—that they only import, and have imported within the last two or three years of these low prices, three per cent. of their consumption: but then they have in the same time exported more than they have imported." But, gentlemen, in this country the case is entirely different. As I have shown you, we import from one-quarter to one-half of our consumption—the bread of the people of this country. The large importation ought to be sufficient to satisfy any body of people that we are not in a safe position to import a larger quantity than this, especially, as I have said before, in the time of war, come when it may. I don't mention these large importations that we receive in this country for a moment with any view of wishing to reverse that system which has been established here, and firmly established within the last few years—free trade, I mean. Neither do we want, as I know of, a Minister of Agriculture here; but we want freedom to grow, untaxed, the natural products of our own soil. The manufacturers argue, and with irresistible reason too, that, from various circumstances in this beautiful island of ours, with its enterprising people, we are adapted to manufacture for the world, with all our advantages of coal and iron, which tend to make this country so great, and we ought to become a great manufacturing people. Therefore, with this irresistible argument, they obtained free trade; and, it appears, rightly too; for you don't find a single man who wishes to reverse this principle: whatever the feelings of individuals may be, it is of no use. It is a matter of fact; and facts are stubborn things, as you all know, you can't contend against. It has become the law of the country, and you cannot resist it: but whilst you give the manufacturers this privilege, if I may so call it, you at the same time have a right to say, "We in the country demand free trade—we demand free trade for the growth of one of our great productions (if not so great as wheat)—barley." We say, "If you are adapted, you of Manchester and you of the North of England, to be the manufacturers of the world, we as agriculturists can say, in all fairness we are entitled to produce what the soil and climate of this country are eminently and peculiarly adapted for; and why put a restraint upon our productions, if you untax yours?" We only say it in fairness; we ask no favour. I believe it is perfectly absurd to say that any favour is asked: for it is only a matter of justice we ask, like the rest of Englishmen. When we say we want no favour, we have been told "You have got some little favours." And what are they? I believe one of the greatest of these privileges is that our shepherd's dog is allowed to jog along free of tax: the rest is, I believe, that the farmer, his master, saves about the same in having no duty to pay upon his fire insurance. These are our many privileges. We never asked for them, and we don't want them: we only want to be put in the same position as the rest of the community. It is difficult to understand how such legislation could have taken place. I can only fancy it must have been done at a lax time of the session, in the dog-days. I once happened to be in the House of Commons in the dog-days, and there I saw one of the senators lying on his back at full-length, and his hat upon his face, just in the same way as you see a lazy hind in a hay-field. It must have been at some such time the legislation took place about the shepherd's dog. We want nothing of the kind: we want fairness. We would

say to the people of Manchester, or wherever free-traders may be, "Don't keep it all to yourselves. Don't let your sympathies run all in favour of foreign producers." They say, charity should begin at home; and I would say, let justice find a resting-place there as well. Gentlemen, I don't mean to detain you much longer. I trust I have said enough to show the fallacy of substituting the fattening of cattle for the growth of corn in this country; and if we left that principle, how dangerous it would be in case of war, not only to the growers of corn, but to the community at large. I trust I have thrown out a hint with regard to your duties respecting your agricultural members, that there should be a source opened up whereby you may in some way or other communicate with them from time to time, and that your opinions should be as thoroughly represented to the House of Commons as every class of the community is represented. This, I am sure, is due to you; and if you only demand it as your right, as Englishmen, in a just cause, you are sure to get it.

Mr. J. G. HOMER agreed with Mr. Damen that the right principle to go upon was to combine the production of stock with the growth of corn. Indeed, he did not see how a great portion of this country was adapted to the production of meat alone. On their hill farms, it certainly would not answer, though there was some land that could perhaps be turned to better account in pasture than corn at the present price. But suppose they were to give up growing corn, as Mr. Bright advised them many years ago in this town, the consequence would be that the supply of the necessities of the people would be left entirely to foreigners, and prices would soon have an upward tendency; for he was informed that, according to quality, ours was now the lowest market, with all our foreign importations. The price of meat must be governed, in a great measure, by the price of corn. Supposing they were left without a root crop, or only half a root crop, and corn was very dear, what remuneration could they get with the cake so high for the feeding, at present prices of beef and mutton? None whatever. But, with the low price of corn, they were able to feed with remuneration. With regard to the malt-tax they only wanted fair-play. The Legislature thought they had given the farmers a great boon by allowing them to malt for feeding purposes; but there were so many restrictions that it could not be done. He believed it would be a great advantage if they could have malt to mix with other things, and that if they were unfettered in this respect they would be able to produce more meat than they did at present.

Mr. J. GALPIN was called upon by the chairman, and said he dissented from one portion of Mr. Damen's remarks. He stated that not only in the House of Commons but out of doors there seemed a disposition not to do justice to the agricultural interest. He of course could not speak for the House of Commons, but on the part of those out of doors he entirely dissented from that opinion. For his own part he thought too much political matters had been discussed at these clubs. That was his individual opinion, and he knew it would not be received with approval by the members present. He was one of those who wished to avoid going into such subjects, and whatever he thought himself he desired to accord the same privilege to others. He, however, trusted the day would be far distant before they saw members merely delegated from an agricultural body or any other body to support individual interest, but that they would be allowed to exercise their judgment as honest and upright men for the good of the community at large. It would be an unfortunate thing if they made anything a question of agriculturists against manufacturers; and he did not think any one would feel it to his interest to advance anything injurious to the agricultural interest.

The CHAIRMAN understood Mr. Galpin to draw a distinction between the feeling out of the House of Commons and within the House. He said nothing about the latter.

Mr. DAMEN thanked the chairman. That was a good distinction.

Mr. GALPIN said he confined his observations to the out-of-doors part.

Mr. T. H. SAUNDERS offered a few remarks in support of what had been advanced by Mr. Damen and Mr. Homer. He also observed that on arable farms the stock cost them quite as much as they got for it, or double as much as where they had good deep grassland; but then they must manage according to the soil and the climate, and could not in many districts pay attention solely to stock. As to barley, if Mr. Damen

could supply good grinding samples at the price he had mentioned, it was impossible to grow it here, and leave any rent for the landlord.

Mr. H. DUKE said his opinion was that the more stock they kept the more corn they could grow. In some localities the land was naturally arable, and in others it was naturally pasture. Within the twenty years he had been in this county one-third of the land had been broken up; and he thought there was an opportunity of keeping stock to a much greater value than when it was laid down. There was one thing which he would mention, and which they heard very little of at farmers' clubs, or when they were going to take the lease of a farm, which was the climate of the country. He believed in this county they had as good a staple of land as in most counties, but the climate was very much worse. If they only went a very little distance, say between Christchurch and Southampton or Portsmouth, he was satisfied that there a man would produce stock with much more profit and more weight with roots alone in ordinary seasons than they could here with all the roots and corn they could give them. This was a great consideration when a man was taking a farm, and he estimated that 5s. an acre would go a very little way towards it. He believed there was more stock bred in this country than twenty years ago; but he considered it a great question whether a larger amount of meat was produced, and he would tell them why. In the market that day he saw a lot of sheep sold weighing about 7 stone, which, with a little extra keep, would have made 10 stone. They would have well paid the expense of keeping a little longer; and stock was often sold just at the time they were beginning to pay the farmer. Thus the amount of produce was reduced, and the population of the country were the losers. It was from facts like these that he was led to doubt whether more meat was now produced than a few years ago. They were obliged to keep their corn till it came to perfection, but not so with their stock, and hence the low price of the one and the high price of the other.

Mr. G. W. HOMER observed that they had been recommended to grow more turnips, but he was inclined to think they were the most expensive crop grown, although a portion was necessary, because it was the best crop under which the land was cleaned. A gentleman of considerable experience informed him that he found his turnip crop best him in growing about £1 an acre, and that the produce from it was but £2—this under the ordinary system of keeping a flock of sheep upon them. That at first sight might appear rather startling; but when they considered the large breadth of land over which sheep went, the clovers and turnips, and the produce of the permanent pasture meadows which they consumed, it was a question whether his estimate was not a sound one. Now, he thought the growing of more cereals and pulse crops, and feeding them on the land, would pay better than turnips. On light land they might sow an early description of pea, and by being cut rather before ripe, it might be followed by a crop of rape, previous to spring corn. On heavy land beans might be substituted, which would be better food than turnips. As to the question of the malt-tax, at the present time they were bringing their untaxed cider in this county from Devonshire at about 10s. a hogshead, whilst the tax upon malt liquor was about 11s. a hogshead.

Mr. DAMEN, in reply, said he had very little to offer, as most of the discussion supported the views he had propounded. With respect to the observations of his excellent friend Mr. Galpin, he did not for one moment suspect that there could be any feeling whatever against the agricultural body in this

neighbourhood; but he did contend that their interests had been somewhat neglected or passed over in the House of Commons for some years past. If they looked into it, they would find that the representatives of the agricultural interest had not had that weight in years past which they might expect under the system of free trade. He would refer to the Malt-tax, and he must say on that question the agriculturists had not had justice done them. He did not wish to put it in any party spirit; but as they had free trade in corn they now asked for free trade in barley. He did not wish to see any rival feeling created between town and country, manufacturer and agriculturist; but he wished to see justice done to the one as well as the other.

The CHAIRMAN, in closing the discussion, observed that with reference to the question of introducing politics in clubs of this kind, he must say he entirely differed from Mr. Galpin, with this condition, that it was with agricultural politics they had to do. These he considered lay strictly within their province; and he could not sit as a member of the club, more especially as their chairman, without insisting on that condition. They had to do with the agricultural politics of the country, confining themselves to those, and laying aside *in toto* all party politics; and he conceived that every member was free to go as fully as he liked into agricultural politics. This brought him to one observation of his friend Mr. Damen, as to the ignoring of the agricultural claims in the House of Commons. He thought Mr. Damen was right in what he had said, that there was an ignoring of the claims of agriculture; and they could not take a better instance to show it than the Malt-tax. They had taken away protection to the British agriculturist, to which he assented for the sake of the common weal; but they claimed that equal justice should be done them. If they took away the protection of the English agriculturist in the growth of corn to the benefit of the foreign grower, surely they could not refuse to do justice to the English grower, by taking off a duty which pressed as a heavy tax upon an article which ranked second in importance of all that he grew. As to the fallacy of advising them to produce stock instead of growing corn, he need only refer to the practical experience of agriculturists, who need not be told which was the most profitable way of employing their land. The system which had been adopted for the last twenty years was the raising and production of as much stock as they could, and the growing of as much corn as they could; and he believed Mr. Duke was right when he said that both must go together in order to make a farm remunerative to the tenant. The larger quantity of corn they grew the more stock they kept; but he did not believe the increase in the amount of stock, even at the present price, balanced the loss they sustained by the lowness of corn. Mr. Damen had alluded to the desirability of their having some means of official communication with their county members. All he could say upon that point was that they had a better means of communication now than before the establishment of these farmers' clubs. They might depend upon this that it had brought them into more direct contact with their county members than they had ever experienced before; and he rejoiced to know that this had been the case. But at the same time he did not see why an agricultural board should not exist in this country as well as commercial boards—the object being the protection and advancement of commerce in the one case, and the protection and advancement of agriculture in the other case.

A vote of thanks to Mr. Damen was then proposed by Mr. Homer, and seconded by Mr. Clements, and that gentleman having responded, the proceedings terminated.

THE ROYAL AGRICULTURAL SOCIETY OF IRELAND.

THE CLONMEL SHOW.

Contrary to previous expectation, the Irish Royal for 1865 has been tolerably successful. It commenced with the judging on the morning of Wednesday, Aug. 16, winding up with a ball on Friday night; and the attendance through-

out was good. Of course, the Lord-Lieutenant was there, and delivered at the banquet on Wednesday an exceedingly practical speech, in which he strongly inculcated the doctrine of self-reliance on his audience, which, he very pro-

perly said, if disregarded they would never be able to remedy the evils under which the country suffered nor advance its prosperity.

The Shorthorn class numbered seventy-nine entries, of which very few were absent; and the aged bulls, which were turned out for the inspection of Messrs. Unthank and Garne, were a useful lot of animals. These gentlemen took for their first choice Mr. Moffat's White Chieftain—a good-handling, thick, short-legged bull, by Mr. Bareroff's Sir Colin, the great opponent in his show days of Dr. McHale. The next was of a different style, a massive, high-standing, wiry-haired bull, belonging to the Right Hon. Mr. Fitzpatrick, who had picked him up at the Newcastle Royal last year. Mr. Malcomson's Field Marshal 2nd, formerly Lord Waterford's show bull, came in for a high commend, his good fore-end making up, in the judges' opinion, for a very awkwardly-set pair of hind legs. There were also two commendations in this section, namely, Mr. Butler's Prince Imperial by the Fairsby Leviathan, which was a challenge-cup winner of the Royal Dublin Society; and Mr. Bareroff's Gray Friar by Dr. McHale, out of a Sir Samuel dam.

The first two-year-old bull, Felix, belonging to Mr. Wallis, though not a stylish animal, has lots of substance, and is an even bull, likely to get good stock. Last Easter, at Dublin, this bull was also first in the two-year-old section, when shown by his breeder, Mr. Jones, of Mullinabro. The second bull at Clonmel, Gwynne of Lothian, belonging to Mr. Massy, was by Lamp of Lothian out of Sweet Poll Gwynne by Duke of Cambridge (12747), and is a good-handling bull, with wide rib, but looking a little pinched-up in his gait when shown out. Mr. Cosby's Ravenswood, also of Lamp of Lothian blood, and which had been the best yearling of the Dublin Show last year, was highly commended.

The yearling bulls were headed by another of the Lamp of Lothian tribe, in Mr. E. J. Smith's massive Chief of Lothian; supported by Mr. Kearney's Son of Dr. McHale as second. This bull was shown in thin condition, which brought out his lightness behind the shoulder more than would have been the case if he had more flesh on him. Mr. H. Butler's Feunian, by Paterfamilias (18521) out of a cow of Holmes' blood, was commended.

There was a large turn-out in the baby-bull section, the two prizes in it being given to a pair shown by Mr. Anderson, Grace Dieu, two very promising calves; and these left such a good lot behind them that the judges cleared off all scores by commending every one of them.

Mr. E. J. Smith, who appears likely to take up the place left vacant by the death of Capt. Ball, showed Capt. Ball's Rechére in the cow class, and won with her. Notwithstanding her frequent appearances in public, Rechére keeps a grand cow, and is not only a show animal, but a regular breeder. The second cow, Mr. Anderson's Dandelion, from Mr. Langston's herd, has a capital breast, and is also very good in her quarters. Mr. Bareroff's Mysic 19, a former winner, came in for the third place in the section; with commendations to Mr. Anderson's Flower of Rocklands, Sir John Keane's Silver, Mr. Malcomson's Knight of Windsor cow, and Lord Lisimore's Flirtation, bred by the late Capt. Ball.

Mr. Jones had his Lady Spencer, with her good breast and rib, in the three-year-old section, and won the first place with her, as he has done before; while Mr. Reynell's well-bred Princess of Wales was put second.

In the two-year-old heifers there were some capital beasts shown, and Mr. Massy's Woodbelle, bred by Capt. Ball, was put first. She has an immense chest and capital loin, but is getting rather gaudy behind. Sir

Robert Paul's very handsome Silk, with her sweet head, and beautiful run of neck, breast, and rib, was second, followed by commendations to the others.

There was a capital muster of yearlings, the judges fixing upon Mr. Anderson's nice handling Gamelen 2nd as first, with an exceedingly perfect heifer, Rosette, belonging to Mr. Welsted, as second. Mr. Meadows' Fanny 15th was highly commended, along with Mr. Welsted's Elfin Rose, which, like Rosette, was by Booth's Elfin King.

Three nice heifer calves were picked out for honours in that class, namely, Mr. Bloomfield's Medora, Mr. Anderson's Octavia 3rd, and Mr. E. J. Smith's Sunshine, which was the produce of his winning cow Rechére.

The other breeds, Herefords, Devons, Ayrshires, polled, and Kerries were meagrely represented, and do not call for any special remarks. In the strictly tenant-farmers' section some good cows were shown, all of which proved the extent to which Shorthorn blood has been drawn upon for the improvement of the dairy stock of Ireland.

The horses were poor in point of quality, and served, in most cases, to illustrate the necessity for immediate and great improvement in this class of stock, rather than to show advancement. The Croker Cup, for the best thorough-bred weight-carrying stallion, was awarded for this season to Mr. M'Craith's bay horse Forager, by Cossack, dam by Liverpool.

The different classes of sheep were well represented, particularly Leicesters and Shropshire Downs. In the former Mr. Owen was the leading winner, obtaining the long-woolled Cup with his shearing ram; while the short-woolled Cup went to a Shropshire shearing ram, exhibited by Mrs. Smith Barry, who took most of the prizes in that department of the sheep classes. Mr. Hamilton was also a successful exhibitor of Shropshires. Mr. Marris, Lincolnshire, came out well with Leicesters and Southdowns, and Mr. Beale Browne with Cotswolds.

The show of Berkshires, in the swine class, was what one would expect in a district where pigs are not only a leading description of stock, but where Berkshires are the favourite breed. Messrs. Joyce and Malcomson were the most successful exhibitors of that description of pigs; and Mr. Wainman and Mr. Napier of white swine.

There was nothing striking in the poultry sections; and the other minor departments of the show, namely, butter and flax, were respectably filled.

The implement yard was not nearly so well supplied as it ought to have been; and it is alleged that the increasing indifference of manufacturers to exhibit arises from the want of that spirit of competition which is brought into play by trials of the different machines. Whether this view is correct or not, we cannot say; but certainly the entries of implements at the Irish shows are not increasing.

The following gentlemen officiated as judges:—

Shorthorns: Messrs. Unthank and Garne. Herefords and Devons: Messrs. T. Duckham and Cureton. Other breeds: Messrs. Mowbray, Guthrie, and Hilliard. Farm horses: Sir Percy Nugent, Major Burrows, and Mr. Darker. Thorough-breds and hunters: Messrs. Boyd, Thurnell, and Clarke. Leicesters: Messrs. Painter, Warburton, and Thurnell. Downs and Shropshires: Messrs. Duckham, Cureton, and Thurnell. Swine: Messrs. Chaloner, Borthwick, and Fisher. Poultry: Messrs. Darker and Staunton. Butter: Messrs. Forde, McDonald, and Greene. Implements: Messrs. Borthwick, Wade, and Finlay.

AGRICULTURAL EDUCATION.

PUBLIC AND PRIVATE CHARITY SCHOOLS.

Under primitive and patriarchal times the gratuitous education of the rising generations by governments, chiefs of clans and tribes, and by wealthy patriarchs, had many things to commend it to the favourable attention of the general public; but the progress of science, and the subdivision of labour, through the instrumentality of the thousand-and-one chemical and mechanical appliances of modern times, which have split society into innumerable sections located over the face of the whole habitable globe, and yet all united by a common fraternal tie of industry, have changed this old educational policy, and substituted in its place one of independent action, whereby it has become the duty of every parent to educate his own children, failing which the children must educate themselves as they grow up to manhood. What was once the rule has now become the exception, the old policy being in a great measure reversed. The change which has thus taken place is no less interesting and instructive, when viewed in a social light, than it is when examined in an individual and industrial, as it shows the moral force and triumph of innate principle over expedience, so to speak, that manifests itself in the breast of mankind, struggling, as it were, to rise above their fallen condition to that common level from which they fell; or as Milton has beautifully portrayed it in "Paradise Regained," only attainable at the further verge of Time. The change, however, is a work of progression, which at the present time is far from being complete; hence the mixed character of our colleges and other seminaries for education, both public and private, that exist in every division of the kingdom, or we may say throughout civilized Christendom, some being self-supporting, others being partially or wholly supported by Government, either by annual grants, or permanent endowments, or partly by both; and a third class being upheld by charity, either by annual subscriptions or otherwise, or by permanent endowments. A few practical examples will best illustrate the respective merits of these several plans in this concluding paper.

The self-supporting system, the first of these plans, is the one that merits special attention, as it is daily gaining ground in the estimation of the public, being free from many objections to which the others are subject. Its principle of action is that of merit, both teachers and taught having to rely upon their own exertions for their respective interests in the matter, the former for their incomes, and the latter for their pennyworth in the shape of education. If a schoolmaster is an industrious, successful teacher, his merits are appreciated in the locality where his school is situated; a large number of scholars collect, to benefit by his abilities; consequently he reaps a correspondingly large salary in fees. If he is, on the other hand, indolent and unsuccessful in his labours as an instructor of youth, the reverse is the case, few attending his schools, so that his income is correspondingly small. On the part of the boys, their position is of a somewhat similar character; for under a good teacher the yoke feels much lighter, their encouragement to make progress greater, and accordingly they advance in their education more rapidly, costing their parents less money and time for schooling of a superior kind than in the opposite case of a bad teacher, who invariably makes indolent, bad scholars, and an expensive education. In the former case a good education is obtained at a great economy of time and money; in the latter an inferior education at a sacrifice of both money and time. And the gains of the one and losses of the other extend to more than school-fees and the length of time spent at school; for they include also the board and clothing of the boys, and also the influence which these circumstances have upon their future welfare when they enter upon their apprenticeships as young farmers and labourers. In a practical light, therefore, the difference between the two, viz., a good and a bad teacher, is not very easily estimated.

It is not always the greatest scholar or the ablest man in science who makes the best and most successful teacher, more especially in the rudimentary branches of education. And

even in the lecture-room of the college, where a higher standard of scientific attainment is necessary than in the grammar-school, the more talented of two philosophers or learned men may not prove himself the most successful teacher. This arises from the fact that teaching the rising generation any branch of science, as agricultural chemistry or mechanics, is an art and not a science. It is not, for example, the science of agricultural chemistry, but the art of teaching that science; and it very frequently occurs that the most talented chemist or profound scholar in any other branch of science is remarkably deficient of the art of teaching. It is not very easy to describe the distinctive characteristics of the one in comparison with those of the other within the limited space at our disposal, but this is the less to be regretted inasmuch as our readers generally must be practically familiar with the facts of the case themselves, as actual examples everywhere abound which are publicly acknowledged.

It is upon a thorough practical knowledge of the art of teaching that the success of self-supporting schools depends. "The right man in the right place" has become a national proverb, and in no case is it more applicable than in the school and class-room. The truth of the proposition manifests itself in every example, from the infant-school up to the professor's chair of the college; and if it is more conspicuous under the self-supporting system, where teachers are entirely dependent on school fees for their incomes, than under the others, where their incomes are wholly or in part paid by Government, or are obtained from some other charitable source, it is partly because the right man fills the right place on the taskwork principle upon which the former system is founded, and partly because of the routine independence of teachers upon which the latter two systems are founded, together with the little value put upon gratuitous education by the taught, according to the proverb, "Easy got, little valued." It may be fallen humanity, but it is now the natural course of things, from which no section of society is excepted; the stimulus of merit, with its appropriate reward, being essentially necessary to industrial action in every art and branch of science and in every sphere of the industrial world.

Self-supporting schools are very differently constituted. Thus a teacher rents a house for an infant-school, grammar-school, or college, and takes in pupils, his income being entirely derived from fees—generally so much weekly, quarterly, or yearly. The whole responsibility of the concern rests upon himself: his merits as a teacher, for example, are known in the neighbourhood to parents, who enter into an agreement with him for the education of their children. In grammar-schools and colleges he may have a number of assistant teachers in his employment, but the principle of action is the same.

In other cases a number of parents join, rent a school, and engage a teacher, who undertakes the work for the school fees on specified terms. In this case the teacher is more or less under the inspection of his employers, but in other respects infant-schools, grammar-schools, and colleges are similar to the last or first example.

Again, not a few landowners build schools, and engage teachers, who undertake the work for the school fees, being less or more under the supervision of landowners, agents, or those whom they may appoint, as the minister and churchwardens of the parish, or the managers of a dissenting congregation, &c.

Again, self-supporting schools may be either day-schools or boarding-schools, but further into details under this or any of the above it will be unnecessary to go, as they are generally well known.

On the merits of Government or national schools and colleges much need not be said: at best they form a case of necessity, the existence of the least of two evils as it were. The principle on which they are founded, if principle it can be called, is analogous to the old oft-told story of "robbing Peter to pay Paul." The people are unable, for example, or think them-

selves unable, to raise the wind for the purposes of building schools and colleges, and of paying teachers for educating themselves, and therefore they apply to Government for annual grants or a round sum to cover a permanent endowment. And how does the Government raise the wind? Simply by taxing the people, and thus making them pay indirectly for educating themselves. We need not go further into detail to show the reader that as a question of principle the establishment of national schools will not bear a very close investigation. It is only as a question of expediency that their existence can be justified, and even when examined under this view the system is greatly more expensive and less efficient in its operation than the modern self-supporting one already noticed.

Necessity, however, is subject to no economical laws, and therefore Government must in many cases tax the whole community, or rather those who pay the taxes for grants and endowments. This is generally done for the ostensible purpose of erecting schools and colleges for furnishing a suitable education for those who are unable to educate their families as they ought to be educated, and in many cases such is actually the plain matter of fact. It is, however, otherwise in not a few examples, more especially schools and colleges for teaching science such as that of agriculture, for they are only adapted for the more wealthy classes of society, who are able to educate themselves. How few students are there, for example, at the universities of Oxford and Cambridge, whose parents are not well able to pay for their education on the self-supporting principle! and nearly the same thing may be said of the Irish and Scotch universities. No doubt when these great national seminaries were first instituted, landowners and those whose sons they were designed to furnish with a suitable education were in a position similar to what the great bulk of farmers are in at the present time, so that as a question of expediency it may be argued that the young lairds and lords should be turned adrift to shift for themselves, and that these great seminaries, English, Irish, and Scotch, should be modernised to suit the wants of the agricultural body and others usually denominated middle-classes, less able to pay for their education, but who are taxed equally, if not more heavily, collectively speaking, than the upper classes. Either such ought to be the rule, or else if the upper classes are allowed to retain the great national seminaries in question, then they (the upper classes) ought to be taxed to support modern schools and colleges for the middle classes. It is not likely that either of these two propositions will be practically carried into effect; but so far as the agricultural body is concerned, the existing anomalous state of things should be borne in mind by landowners, who get their sons educated principally at the expense of the public, including their own tenants; for so long as the lower and middle classes are thus heavily taxed to pay for the education of the upper and more wealthy classes, they will, as a matter of course, be less able to pay for the proper education of their own families.

It will thus be seen that the existence of the old system, with its rich endowments and less amount of labour to perform in teaching, including the precept and example which it affords, opposes the progress of the more meritorious and self-supporting plan. That our old universities ought to undergo a thorough reformation in the subdivision of labour and class-rooms so as to conform to the requirements of modern times is manifest, and in such a reformation we do not see why teachers and professors ought not to be placed more and more upon the taskwork principle, and wealthy students made to pay higher fees, so as in a great measure to cover their education, Government grants and revenues from endowed properties being confined to buildings, museums, laboratories, and experimental expenses in the different branches of science, without regard to that social division into upper, middle, and lower classes.

The least objectionable mode of Government assistance is where it is confined to purchasing school and college grounds, erecting buildings, furnishing museums and laboratories and other permanent works of this kind, and then leaving teachers and taught to do the rest on the self-supporting plan. For a few years small sums in the form of salaries may, in some cases, be given in order to start the self-supporting system into healthy effective action; but such salaries should be terminable, and the teachers and professors thrown ultimately wholly upon their own industry; for it is clearly, as has already been shown, the more remunerating plan for teachers themselves, also the cheapest plan for the taught, and the best plan

for all parties interested, provided always that the teachers are thorough masters of the art of teaching.

Charity-schools and colleges, endowed or supported by private individuals, are free from many of the objections to which Government ones are subject.

Many of our national seminaries, such as the Universities of Oxford and Cambridge, are largely included under this system, land and money having been left them by private individuals for educational purposes; and in a similar manner many of our large charitable institutions for the education of certain classes of society are less or more mixed up with Government grants, the latter having been found necessary to give efficiency to the former in terms of the bequests of the donors. There is a large portion of the rising generation without the means of obtaining an elementary education, and private charity can hardly be turned into a better channel than in providing such for this class, whose members, it must be borne in mind, are not exclusively confined to the lower orders of society, but include many of the upper ranks. Hence the different grades of charity schools which have been instituted to meet the exigencies of the case, both on the day-school principle and also boarding-school principle.

In a review of this kind of schools the details are far beyond our limits for discussing in a single paper. This is perhaps of less importance, since comparatively little or no charity has been extended towards the education of the practically agricultural body, *i. e.*, tenant-farmers and labourers. No doubt a few bursaries at some of our Universities are open to competition for the sons of the better-to-do class of farmers, and a few who work their way upwards under public or private teaching to finish their education at college; but, when compared with the great bulk of the agricultural body, including small farmers and labourers, they must rather be considered an exception than otherwise.

It must not be inferred from this that we are advocating the gratuitous education of the rising generation of the agricultural body. Nothing could be farther from our mind, for the small tenant farmers and agricultural labourers ought always to be able to pay for the education of their children. No doubt there are a few orphans for whom charitable provision requires to be made, and for them alone we advocate a gratuitous education. Charity advanced in the form of school fees farther than this, is in too many instances charity misapplied. At the same time landowners, including those of corporate towns, may grant schools and colleges rent free, and uphold them advantageously, as some of them do, without any sacrifice of the self-supporting principle, as they would in the vast majority of cases derive indirectly ample interest on their capitals thus invested, while the industry of teachers and taught would be mutually stimulated; by doing so they would in some measure repay the advantages they themselves gratuitously derive from our national universities and schools at which they are educated.

THE LATE DUKE OF RICHMOND.—‘A gay, wild-eyed roan with a white calf brought our eye back to short-horns in the pastures at Old Mills, where Mr. Lawson has a nice herd; and in front of us, about a mile away, the ‘sun shines fair’ on the cupolas and warmly-friated sandstone of the Elgin houses. Hard by it is the celebrated Green, where many a shorthorn Waterloo has been fought, and where buyer and seller have set each other like cocks so often, with ‘The Cock of the North’ to look on. There, too, came ‘The Farmer’s Friend’ in his simple guise, like an old soldier, always in time, and with a kind greeting and a pleasant story on his lips. Buchan Hero of the white eyelash had passed away from Mr. Ferguson Simpson’s hands before that gentleman took up his residence at Coveea, near Elgin. Hence he never joined the bull ranks on the Green; but he won in a still greater fight at Berwick-on-Tweed, against ‘the English bulls, the Scotch bulls, and a’ the bulls. One of his great admirers, who had his eye to a ‘crank’ in the palings on that memorable day, thus describes the contest: ‘I lookit, and they drew them, and they sent a vast of them back; again I lookit, and still the Buchan Hero stood at the head. They had nae doot of him then. A Yorkshreman was varra fond of him. And he wau; and Mr. Simpson selt him to Sir Charles Tempest for two hundred. It was a proud day that for Aberdeenshire and Mr. Simpson.’ We rode through Elgin without drawing

rein. Time was pressing, and we were only just able to admire the thistle on the fountain, to wonder why there should be both a 'Batchen-street' and a 'Batchen-lane,' and to glance from the gaunt-eyed, thin-legged wayfarer who illustrates the psalm over the Arms House door, to the ruined cathedral, where the ivy was shrouding the savage handiwork of 'the Wolf of Badenoch.' The road wound round some curious heather knolls, and the long beech hedges and the Gordon tartan, green with a single yellow stripe, soon showed that Fochabers was nigh. The late Duke of Richmond used to tell with great glee how, when other officers indulged in gaudy papers, he lined his tent at Aldershot with tartan during his stay there with the Sussex militia, and how he proved himself the canny Scot by unfastening it and carrying it back to Goodwood with him, to 'serve in the next campaign.' Shortly before the late Duke's death in 1860, a new outlet was made to the Spey, but it did not just chime in with the temper of this most rapid and unmanageable of Scottish rivers, and taking a turn eastward, it all but cut away the fishing station at Tugnet. Watching the progress of the works to defend the village

of Garmouth and its adjacent part of Kingston, gave his Grace almost a daily object for a four-mile drive during his last summer at Gordon Castle. When he had seen Tugnet, he would often go and visit a small steading which he was putting up near the railway station. The tenant only paid £5 a-year; but he was an old Peninsular man, and there was the great tie. Many and long were his cracks about old times and comrades with Captain Fife, who has also exchanged his sword for a ploughshare. His Grace quite astonished another old 'cannon-ball' of the district, who did not know him by sight, when he asked him to fetch his Sunday waistcoat with the medal on it. The old man could not tell for his life 'how the gentleman kenned I wur theer, and that I wur hit gan down the brae at Orthes; it's true enough. Did ye ever hear the like?' It was the Duke's earnest care that his tenants should do well, and he latterly loved far more to be among his farm improvements and his Southdowns than he did to go to Glenfiddich, where he had once been wont to spend nearly half of his three months' stay.—'Field and Fern, or Scottish Flocks and Herds,' by 'The Druid.'

PROFESSOR SIMONDS ON THE CATTLE PLAGUE.

At a meeting of Norfolk farmers Mr. C. S. Read, M.P., presided; and Mr. E. Howes, M.P., and Professor Simonds were among those present.

The CHAIRMAN stated the result of an interview which he and some other gentlemen had had at the Home-office on Monday with Mr. Waddington. Before they went to the Home-office they proceeded to the Metropolitan Cattle-market, where they found that the inspectors had made a rigorous examination, and had excluded some cattle. They saw some, however, in which they fancied they could discover symptoms of the disease. Professor Simonds accompanied them to the Home-office, where they suggested that the Order in Council which had been issued for the metropolis should be extended to Norfolk. The difficulty stated to exist was that an Order in Council could only be applied to a town or place within certain defined limits. It was suggested that it would be desirable if possible to prevent the removal of diseased cattle to different parts of the country, but there was a disinclination on the part of the Government to make such an order. A suggestion was then made for the more efficient supervision of cattle landed in England and for putting store stock in quarantine. It was objected that there could be no quarantine, as there was no accommodation for the stock; and it was also stated that the existing inspection was considered to be sufficient. Professor Simonds suggested that there should be a better inspection of cattle coming from Russia. This opinion was favourably received. The Chairman, in conclusion, hinted that farmers should agree not to purchase stock in markets or fairs for at least six weeks. This would prevent an importation of foreign cattle and check the spread of the contagion.

Various statements were made as to the state of cattle in Norfolk. From some localities the reports were very discouraging, but in other districts the cattle appeared to be still healthy.

Professor SIMONDS expressed his opinion that farmers might rely upon receiving some assistance from the Government, but that in the main they must rely on themselves. The reason why so little could be expected from the Government was the lamentable condition of our legislation upon these matters. He was perfectly satisfied that the disease would spread in the several places where it now existed, and that sooner or later, unless stringent measures be taken, the whole of the country would be affected. He did not come to this conclusion simply because he viewed the disease as one which spreads its contagion, or, if he took the view of his friend Mr. Wells, because it was atmospherical, but he came to the conclusion from positive experience which had been gained in other countries, and also from the records which were left to us of the experience which was gained in this country 120 years ago, when the disease existed in England. It was recorded that in 1745 the disease made its appearance in England, and that it existed from time to time down to 1757.

When they came to look at the small amount of traffic which then existed among cattle, when they came to look at the state of society as a whole, at that time, and when they considered that, under the circumstances which then prevailed, the plague lasted 12 years, they had certainly not much encouragement or hope for its removal under existing circumstances. It was also not very encouraging for them to remember the fact that at the time of the last disease an Act of Parliament was passed, empowering the King in Council to issue orders for information to be immediately given to the local authorities by farmers and others whose cattle were affected, and upon that information the King was empowered to order all such animals to be killed and buried in pits with their hides on, the additional precaution of throwing quicklime in the pits, and keeping the ground enclosed for a given time, being also taken. All these measures failed to exterminate the disease which existed at the time of which he was speaking; and, as to the identity of the disease with the one which now existed there could not be a question, because those who described it at that time were well calculated to do so, they being chiefly physicians. It was very true that veterinary science was then in its infancy—in fact it was scarcely in existence; but the medical science was of course very different.

The CHAIRMAN asked whether the last outbreak was occasioned by foreign importation?

Professor SIMONDS said it would be difficult to answer a question of that sort, but he had no doubt that the disease was introduced on that occasion as it had been on the present occasion. A statement was on record that two calves were purchased from some persons residing in Holland, the farmer who made the purchase having the idea that the Holland calves would improve his own stock, and when they came to look at the milking qualities of the Dutch cattle they might understand that there was a certain amount of truth in that statement. Another statement was a very important one, and was very likely to be true—namely, that some persons had purchased from Zealand a large number of hides which had been taken from diseased cattle, and they were stealthily brought over to this country for the sake of making more money of them. Either of those statements might be correct, and he (Professor Simonds) was inclined to believe them, but about the introduction of the disease at that time there could not be a question. They must recollect that this was a disease not belonging to England. It no more belonged to us than the Asiatic cholera, the yellow fever, or any other of those diseases belonged to us. It was a disease specially belonging to Russia, Austria, and the Danubian provinces, Bessarabia, and the whole of the countries lying eastward. The countries on the west side of the line were strangers to the disease, save and except upon its introduction. Sometimes it went into Prussia, sometimes into Bohemia, and sometimes into Bavaria; but it never went there except upon the introduction of cattle in

whose systems the disease was either incubated at the time, or the cattle themselves were positively in a state of disease. It was, however, scarcely possible for the disease to be introduced in the latter way, because the sanitary regulations of those countries were such as to prevent animals in that state being allowed to pass. Therefore it could only be brought by animals after the ordinary period of incubation had passed, and before the disease had begun to declare itself. It would always be a knotty point for them to decide; in fact, he dared say they never would be able to decide it to the satisfaction of all their minds. There were such men to be met with in the medical profession, and also in their own profession, who were called contagionists; and there were men not at all favourable to this view, of disease being spread by contagion, or at any rate, not being exclusively spread by contagion; it was difficult, of course, to draw a line between the two opinions. Perhaps it might be that the truth lay in the middle there as it did in other things; but let them at the same time not lose sight of the fact that the disease was contagious, and that it was by infection that it extended itself. It was true that they could not always trace every individual case as it occurred, as they had heard that morning, but it was very difficult indeed to do that when they knew the various sources by which the disease spread and the various *media* that might be brought into operation. For instance, if they placed some sheep with unhealthy cattle, those sheep which were not themselves subject to the same disease would not become affected for a month or two, or more; but, of course, the danger was to other cattle. If they took sheep from an infected to a non-infected lot of cattle—he did not care whether it was a mile or two miles off—and mixed them with a lot which were perfectly healthy, the latter would be as likely to take the disease as though they had been placed with the diseased cattle themselves. He knew of an outbreak which occurred the other day in the neighbourhood of London, where the animals were apparently isolated from all others. It was said, "Oh, here is a case of spontaneous origin." He had inquired into the case, and the fact was found to be that the sheep were placed in pasturage in a park, a portion of the park being let off to dealers, and the dealers were in the habit of not only taking their sheep to the park from the market, but occasionally they would allow them to remain, if not sold, until another market. This being so, he thought they could not wonder at the existence of the disease in the market. Could anybody say that he had had in this country a real good case of spontaneous origin of the disease? He had shown that for more than 100 years this country had been free from the disease, and surely during that time there had been sufficient mismanagement among animals to induce the disease to appear if it could be induced. Not only had this country been free from the disease, but it might be said that the whole of the continent of Europe, generally speaking, had also been free from it for many years. It was a fact, however, that it had now been introduced. How did it get into Norfolk? Directly from the Metropolitan Market. How did it get into Suffolk? Directly from the Metropolitan Market. How did it get into Shropshire? Directly from the Metropolitan Market. He could show them that in almost every case—certainly every case which he had traced out—it was through the Metropolitan Market and through the great traffic of cattle in this country that the disease had spread as it had done. He would give them an instance as to how it had spread in Sussex. Two or three farmers, residing not far from Chichester, were dairy farmers. They were in the habit, as was the custom in some parts of Sussex, of making veal by calves. One farmer went to Chichester market and bought a calf. Believing that it was a country calf, and had been sent there by a brother-farmer, he put it to a cow, and in two or three days afterwards it was noticed to be dead. He was stating a fact which occurred in Sussex. A cow next the calf-pen was first attacked, and then the cow which suckled the calf was next attacked; so that the more directly cattle were together the more certainly there was of the spread of the disease. In the cases mentioned 11 cows and 12 calves died. Another farmer lost 15 cows and 15 calves by introducing into his dairy a calf purchased from the same source. He thought this was an answer to the argument that the disease was an atmospherical affection. It seemed to him that the best way in which this evil could be met was to form in the different counties, where the

disease existed, societies such as that which it was proposed to organize in Norfolk. By such associations they could, for example, in Norwich put in full force an inspectorship of the market, and so on. This would do good, no doubt, but not so much as we might at first sight expect, because there might be a large number of cattle on Norwich-hill which had been exposed to the infection without any one knowing of it; as there might be no signs by which the disease could be recognized at the time; but there would be a moral effect—persons knowing there would be an inspector, and not knowing how soon an animal would show the disease, would hesitate to send such animals to the market, and a great amount of good might thus be done. With regard to seizing diseased animals, that was an important point, and the law could be put in force in all towns where there were corporations or powers sufficient. A great deal might be done by the towns, and a great deal might be done by union on the part of cattle owners, farmers, and others. If they carried out the principle laid down by Sir Thomas Beauchamp, of non-remuneration to an individual who should not within a certain length of time give notice of the existence of the disease, they would be doing an immense amount of good, and he had heard that proposition with great pleasure. There were one or two other points he should like to say a word upon, because they had not altogether escaped those whose duty it had been to take some prominent part in this matter. One was the proposition that they should abstain from buying cattle for a certain length of time, and it was also suggested that they should abstain from buying foreign cattle. He considered that those two recommendations would have contributed greatly to the value of certain propositions of his which had been put in type by the Privy Council, and circulated, he believed, by the newspapers throughout the length and breadth of the land. He hardly knew whether, at a meeting like that, it was legitimate in him to say that those two propositions were really the first two that stood on his list (Hear, hear), but as he was only a servant of the Government it was not for him to disagree with their putting a pen through those propositions, which had been done, not because the Government were desirous of doing what would in any way prevent benefit arising from resolutions of the kind, but that they felt that they might be hereafter called upon to frame some resolution on that basis which they could not practically carry out. For that reason, therefore, those propositions were struck out. His proposal was, not only that no farmers' purchases should be made for six weeks, but that none should be made at all except to the extent of buying animals fit for slaughtering, that no store stock should be bought at a fair or market at all, but that the farmers should buy of each other, and not at the fairs or markets, for a time. With regard to foreign cattle, he had suggested that they should avoid buying them, as it was by them that the disease had been brought into this country. When he said they should avoid buying foreign cattle, he did not mean that they should avoid buying cattle which was food for the people, but that they should avoid buying foreign cattle that were not fit for food for the people, and which when bought they must bring on to their own farms to graze. Let the farmers get their profits—if they got any profits at all—out of their own stock, and not encourage foreigners to send their stock over here (Hear, hear). Mr. Read had very properly drawn attention to the impropriety of sending foreign store stock throughout this country, and he had suggested the other day that store stock should not be permitted to come into our ports. But who was to draw the line of demarcation between a store animal and a lean animal that was fit to be slaughtered? If any of those he was addressing went, as he had done, into the Metropolitan Market, and saw the beast sold to be knocked down by the butchers, they would be puzzled to know what was a store animal and what was a fat animal (laughter). There was such an immense amount of practical difficulty in the way that it really could not be carried out; but they might do something with reference to importations from abroad. So long as they kept westward of the line he had alluded to, there was no risk of bringing the disease into the country; the moment they crossed the boundary, that moment danger arose. It was a question to consider when the danger arose, and he believed it was only within the last two or three months that this kind of commerce had extended its ramifications into Russia, Hungary, Poland, and Galicia, and what had been

the effect of it? He had heard of a lot of Russian cattle coming here. It was told to him in the most incidental manner, and he began to study when he heard of it, because he knew that Russia was the home of the disease, and consequently he knew the risk the English people were running. He inquired how they were coming. He was told they were to be got together at Revel. He asked were they coming over the Baltic, and was told they were, and that probably they would come to Hull. He kept his eye on that cargo, so to speak, and determined to find out all about it. He had no reason to believe that any of those animals were affected by the disease, but he alluded to it to show how the traffic had come. The animals were got together at Revel, and sent over in an experimental boat. They were bought in Russia at a very low price, which left a large margin in England to cover expenses; they were put on board a vessel, they came round by Denmark, stopped at Copenhagen to take orders as to whether they should be taken to Hull, or London, or elsewhere, as suited the policy of the importers, because when they talked about Dutch cattle they probably came directly from Holland, but were not necessarily Dutch, and this was what caused the difficulty with regard to quarantine. In one boat he had alluded to, there were 320, and 145 were sold in Hull, parts of which went to Manchester, Derby, Wakefield, and that district. The remainder, 175, went to London, lay for two or three days in the lay-house close by Islington, where the disease first broke out, and when sold in the Metropolitan Market no less than 120 of them went down to Gosport to supply the shipping. A similar thing had occurred at Plymouth, and only yesterday the town-clerk of Plymouth was with the authorities at the Privy Council-office, and he spoke of the disease existing there—carried there in the same manner by cattle bought in the Metropolitan Market, and sent down for the supply of shipping. Hence it was that the disease got spread. They found that there was a little too much difficulty in the way of coming round by that tempestuous sea the Baltic, and so they adopted the plan of sending the cattle from Revel and other ports to Lubeck, where they were put on the rail and sent to Hamburg and shipped with animals collected together at Hamburg, the whole of them coming over together; so that when they arrived here no one could tell where the cargo came from. Part of them might be perfectly healthy and from a healthy district, while part might come from an infected district. If they could shut the door against importations from those countries he had alluded to, they would be doing much good. Under the Importation Act they were empowered to take any measures they liked; they could even slaughter all diseased animals when they came in, could burn all the material they were surrounded by, disinfest the ship—in fact, the powers were unlimited. Consequently there was plenty of power to regulate the importations; but here was the difficulty—how could they, seeing that the cattle were brought overland to Antwerp by way of Mayence, and shipped there—how could they identify every animal? He believed, however, they might do a vast amount of good by shutting those Baltic ports, and that if they could obtain an Order in Council to prevent animals from being brought from ports of Russia, and if they planted a man familiar with the breeds of cattle and the ins and outs of the cattle trade at Lubeck, if the Lubeck Government would give power to put such a man there, as Mr. Waddington seemed to think they would, they would be shutting out one of the chief sources of the supply to this country of infected animals. If they did not adopt all these precautions they would have importation on importation year after year, from which the result would be a continued loss to this country. It was a most difficult question for the Government to deal with, when they remembered what was the present price of meat, and that the English were a meat-eating people. Their present purpose was chiefly to get rid of the evil now existing. He had before said that every one must look out for himself and his own interest, and to a great extent be his own policeman in this matter as well as a policeman over his neighbour, and he felt assured they would to a considerable extent exterminate the disease from their own districts (Hear, hear).

The CHAIRMAN asked if it were a fact that the development of the Russian cattle trade had only just taken place.

Professor SIMONDS believed that until the last few months absolutely no animals were brought from Russia to this coun-

try, which arose from the fact that they could not bring them by way of Prussia. When he saw some Podolian oxen, he asked some of the proprietors how they got them there. They said they did not know. He asked how they crossed the Prussian frontier, and was told they came by way of Prague. His reply was, that they must have come by way of Cracow, as the rails went there, and he could not understand how they were got here. His own opinion was that they had not come that way at all, but had come by way of the Baltic to Lubeck, and thence overland. It would not answer the dealer's purpose to send them the other way. The delays were too great for them to be brought overland; and this was one of the hopes he had from shutting the Russian ports. The Hungarian oxen they had not much fear of. It is true they might have had something to do with bringing the disease here; but the gathering together of Hungarian oxen at Vienna, the length of time occupied in getting them to Mayence, and from Mayence to Antwerp, and then shipping them here, exceeded the period of the disease; so that if they arrived in a diseased condition it would be perceived by our inspectors, and no harm would be done by them. Besides this, in Hungary a cordon was drawn round a farm immediately the disease appeared; no man, woman, or child was allowed to go off or on, not merely during the existence of the disease, but for three weeks after killing the last animal. Even congregations in the churches were interfered with; roads were turned when possible, to prevent passengers passing too near the infected localities, and the most extraordinary measures, to English ears, were taken to prevent the spread of the contagion. It could only be by passing through a thousand such cordons that the disease could get to this country. Knowing that all these regulations existed there, and that so sharp a look-out was kept, he was inclined to believe that if the Russian ports were shut the disease would be shut out (Hear).

Mr. WELLS asked Professor Simonds whether he really thought the disease was spread by contagion or infection, and in no other way.

Professor SIMONDS said this was not a meeting for discussing the pathology of the disease, and therefore they could not go fully into that part of the question, although it had the highest interest for members of the profession; but he thought that when they looked at all the facts in connection with the disease, they were justified in saying that it only spread by contagion or infection. It was true that it could be hemmed in, and was hemmed in. It might exist in a village where one farm was infected, and there were perhaps twenty cattle on that farm, and although there might be a hundred and fifty or two hundred other cattle in the village, if the regulations were well carried out they kept it entirely within the boundary.

After further conversation, the proceedings terminated.

THE DISEASE IN CATTLE.

SIR,—Having been for above 30 years extensively connected with the trade and sale of cattle, I feel it my duty to forward you the following facts and my experience relative to the present disease in cattle, which I think you will deem ought to be published.

While we naturally view with alarm the disease among cattle, and are anxious that every precaution and proper steps should be taken to stay the spread of such a calamity, yet the public should hesitate before they give credence to the reiterated statements made by certain professors connected with veterinary companies and colleges. We find upon examination of their statements that they do not understand the origin and cause of the disease, neither have they any remedies that have been proved to be of any use or in the least efficacious; also, they are entirely at variance in their opinions among themselves. It is assumed by some that this disease has been imported from abroad, yet though the most strict inspection, under the direction of Government, has been made of every head of foreign cattle, it is not proved that any are unsound, but on the contrary, that they are more sound than English, Irish, or Scotch. This being well known by those who buy and slaughter them, they are especially and almost invariably bought for those parties who are the most particular in their investigation, viz., the Jews. No class of people pay so much attention to the cleanliness, wholesomeness, and sound state of their meat; priests are appointed to see their oxen killed, and most mi-

mutely examine the carcases: this must be admitted as a very distinct test of the soundness of foreign oxen. It is also a fact that 80 per cent. of all the oxen bought to supply the Government contracts are foreign: about 600 per week throughout the year are required for these contracts. All the beasts are subject to a second rigorous official inspection before they are allowed to be killed at the various dock-yards, and then there is a due inspection of the meat.

It is a very serious matter for any person to assert that for which there is not the least proof, viz., that the disease is brought into this country by the importation of foreign cattle. It is a great blessing that they do come to help to supply the increasing demand of food for the people. What would otherwise be the fearful price of meat? Last Monday we had 3,500 foreign cattle in the Metropolitan Market all perfectly sound, some of which, from their excellent quality, made as high price per lb. as English, some moderately-sized beasts from Biemen making £30 each.

One of Professor Gamgee's sapient remarks—that the increased supply by foreign beasts, which is above one-third of the whole supply of the London markets, tends to increase the price of meat—proves that such Professors are merely professors; but those who heard his contradictory statements of his own statistics in the committee of the House of Commons last year, will know what reliance to place on his observations.

As to the proposition of causing foreign cattle to undergo a quarantine for a fortnight, this would be perfectly unreasonable; for where could be the sense or justice of detaining 5,000 cattle per week, if needed for immediate consumption, and which are pronounced by efficient Government inspectors to be sound, in the vicinity of London, where they might imbibe the very disease which is prevalent in this country?

As chairman of a large meeting, held last year, of graziers, salesmen, and others interested in the trade and feeding of cattle, relative to the foot-and-mouth complaint, it became my duty to sign a circular, at the direction of the meeting, addressed to each Member of Parliament, to the effect that, in the opinion of the meeting, the foot-and-mouth disease was caused by a baneful atmospheric influence; Professor Simonds subscribed to and concurred in this opinion, and in each expression of the letter. If the foot-and-mouth complaint was then caused by the bad state of the atmosphere, why not the present disease, which simultaneously attacks animals in various countries where they have not had any contact with foreign cattle? what is to stay the winds of the atmosphere from visiting not only counties, but countries?

In the absence of all proof that this disease is imported, for no foreign stock has been known to be affected until they have been a considerable time in this country, is it not reasonable to conclude that it is a species of cholera in the air? There is nothing antagonistic to this theory in the fact that the cowsheds of London are very generally attacked. In the case of fevers and epidemics, would they not dwell and be fixed in localities that were badly drained, and not properly ventilated? About 130 years since England was visited by a similar scourge; no foreign cattle was then sent.

The importance of the subject I trust will be a sufficient excuse for troubling you with this letter, feeling it my duty to give publicity to facts that come under my extended experience.

I remain, yours obediently,

Stoke Newington, Aug. 11.

JOHN GILBERT.

PROFESSOR FERGUSON'S REPORT TO THE IRISH GOVERNMENT.

In accordance with instructions received from the Irish Executive, I proceeded to London to investigate the nature of the cattle plague now raging in that metropolis, and the best means of preventing its introduction into Ireland. On seeing some of the cases, which were shown to me by Professor Spooner, the principal of the Royal Veterinary College at Camden Town, I immediately recognised the disease as an old European continental acquaintance—one which had frequently ravaged the bovine herds of Europe, particularly those of the northern and midland states. The cattle malady, at present so fatal among the dairies of London, and also to the cattle of many of the English provinces, to which it has already extended, is malignant, contagious typhus—the most important peculiarities of which are its great fatality and rapid

extension by contagion and infection. It is much more contagious, infectious, and fatal, than any other disease affecting the oxen tribe. It is also considerably less amenable to medical treatment, all kinds of which it has hitherto set most completely at defiance. Although by the majority of veterinarians and agriculturists malignant bovine typhus is considered to be invariably the result of contagion or infection, or both, such is not the case. Malignant typhus can be generated in an animal without being the result of either infection or contagion; but once generated here in a single animal it becomes rapidly extended and multiplied by contagion and infection. Some veterinarians deny its being either contagious or infectious. They must, however, be affected either with an obliquity of judgment or an insufficiency of observation and experience relative to the malady in question. It is not alone contagious by immediate contact, but can be propagated from diseased to healthy animals by mediate infection, or the latter coming in close proximity with objects that have been in contact with or the close neighbourhood of the latter. Dogs, cats, and even fowl are capable of becoming the vehicles of malignant typhus infection. This ceases to be a matter of wonder when it becomes known that the mouth-and-foot distemper can be carried from an infected townland or a farm to one at a considerable distance, on which the herds and flocks have hitherto been sound, by crows and other wild birds. These feathered carriers of pustular infection, by walking over the infected pastures, get some of the infectious matter on their feet, and in their flights in search of food convey it to distant fields and pastures. However far-fetched may seem this theory, it has been proved or demonstrated to be true by a pinnioned tame jackdaw being used in an experiment to test it by being made to walk in a pen of infected sheep. His feet would take up and retain a sufficient quantity of pustular infection to infect a hitherto healthy portion of another and distant pasture. The experiment was a successful one. In a few days the sheep confined in a pen on the hitherto healthy pasture, into which the jackdaw had been turned after being among infected sheep, were all affected with the foot-and-mouth distemper. The important question to be now decided by the Government is, what are the best means of preventing the introduction of the cattle plague or malignant contagious typhus into Ireland? There is but one way in which the disease can be prevented from affecting the bovine herds of this island, and that is the immediate prohibition, by an order in council, of the importation of any cattle from the seaboard into Ireland. I wish it to be distinctly understood by the Irish Executive that I regard the total prohibition of cattle importation into Ireland, as long as there is the slightest trace of the disease in England, or those states having the disease in them, from which that country imports cattle, as the only means that have any probability of preventing the introduction of the cattle plague into Ireland. I am thereby adverse to any less stringent measures, such as quarantine. And even should importation be totally prohibited, it is by no means certain that the disease may not become generated from mere atmospheric influence, or propagated by mediate infection, over the vehicles of which Government have no control whatever.

HUGH FERGUSON,

Her Majesty's Veterinary Surgeon in Ireland.

THE CATTLE DISEASE.

A supplement to the *London Gazette* of Friday, published on Saturday, August 12, contains two orders by the Lords of the Privy Council, dated the 11th of August, relative to the cattle disease. The first is in the following terms:—

“Whereas, by an Act passed in the Session of the 11th and 12th years of her present Majesty's reign, intitled ‘An Act to prevent until the 1st day of September, 1850, and to the end of the then next Session of Parliament the spreading of contagious or infectious disorders among sheep, cattle, and other animals,’ and which has since been from time to time continued by divers subsequent Acts, it is (among other things) enacted that it shall be lawful for the Lords and others of her Majesty's Privy Council, or any two or more of them, from time to time to make such orders and regulations as to them may seem necessary for the purpose of prohibiting or regulating the removal to or from such parts or places as they may designate

in such order or orders, of sheep, cattle, horses, swine, or other animals, or of meat, skins, hides, horns, hoofs, or other part of any animals, or of hay, straw, fodder, or other articles likely to propagate infection; and also for the purpose of purifying any yard, stable, outhouse, or other place, or any waggons, carts, carriages, or other vehicles; and also for the purpose of directing how any animals dying in a diseased state, or any animals, parts of animals, or other things seized under the provisions of this Act are to be disposed of; and also for the purpose of causing notices to be given of the appearance of any disorder among sheep, cattle, or other animals, and to make any other orders or regulations for the purpose of giving effect to the provisions of the said Act, and again to revoke, alter, or vary any such orders or regulations; and that all provisions for any of the purposes aforesaid in any such order or orders contained shall have the like force and effect as if the same had been inserted in the said Act; and that all persons offending against the said Act shall for each and every offence forfeit and pay any sum not exceeding £20, or such smaller sum as the said Lords or others of Her Majesty's Privy Council may in any case by such order direct:

"And whereas an order was made in pursuance of the authority of the said Acts on the 24th of July, 1865, by the Lords of Her Majesty's Most Hon. Privy Council, applicable to the city of London and to the metropolitan police district, containing certain provisions for the purpose of preventing the spreading of a certain disorder, of which the nature was at the time of the making of the said order uncertain, but which has since been ascertained to be of a typhoid nature, and is commonly designated as the 'cattle plague,' and which may be recognized by the following symptoms:—

"Great depression of the vital powers, frequent shivering, staggering gait, cold extremities, quick and short breathing, drooping head, reddened eyes, with a discharge from them, and also from the nostrils, of a mucous nature, raw-looking places on the inner side of the lips and roof of the mouth, diarrhoea, or dysenteric purging."

"And whereas inspectors have been appointed in pursuance of the provisions of such order:

"And whereas it is expedient to make further regulations or the district to which the said order is applicable:

"Now, therefore, the Lords of Her Majesty's Privy Council do hereby, by virtue and in exercise of the powers given by the said recited Act, and the several Acts continuing the same, as aforesaid, order as follows:—

"1. That in this order the word 'animal' shall be interpreted to mean any cow, heifer, bull, bullock, ox, or calf.

"2. Every inspector appointed or to be appointed under the provisions of the Order in Council of the 24th of July, 1865, shall have the power of entering upon and inspecting any premises in or upon which he has reason to believe that there is any animal labouring under any such disease, from time to time, as often as he may think necessary.

"3. Every person within any district for which an inspector shall have been appointed as aforesaid, upon whose premises there shall be any animal labouring under any such disorder, shall, as far as practicable, keep such animal separate and apart from all other animals, and no person shall, without the licence of such inspector, send to market, or remove from his premises, any such animal, or any animal which has been in the same shed or stable, or has been herded or been in contact with any animal labouring under such disorder.

"4. Every animal within any such district as aforesaid dying of such disorder, or slaughtered on account thereof, shall be buried, if practicable, on the premises where it has died or been slaughtered, or (if this be not practicable) as near thereto as may be convenient; and if such animal be not buried with its skin, its skin shall be disinfected in such manner as the inspector of the district may direct.

"5. Every person within any such district, on whose premises there shall be any animal so labouring as aforesaid, shall cleanse and disinfect such premises in such manner as the inspector of such district shall direct.

"6. Every person offending against this order shall for every such offence forfeit any sum not exceeding £20, which the justices before whom he or she shall be convicted of such offence may think fit to impose."

The second order repeats the preamble of the first order. It then goes on to say—

"And whereas since the making of the said order the said

disorder has appeared in other parts of England, and it is expedient to extend the provisions of the said order to the remaining parts of England and Wales, and to make further regulations for the purpose aforesaid for the last-mentioned parts of the United Kingdom:

"Now, therefore, the Lords of Her Majesty's Privy Council do hereby, by virtue and in exercise of the powers given by the said recited Act, and by the several Acts continuing the same, as aforesaid, order as follows:

"1. That this order shall extend to all the parts of England and Wales not comprised in the said recited order.

"2. That in this order the word 'animal' shall be interpreted to mean any cow, heifer, bull, bullock, ox, or calf.

"3. If at the date of the publication of this order in the *London Gazette* there shall be any animal labouring under any such disorder in the possession or custody of any cowkeeper, dairyman or dairywoman, or of any milkman or milkwoman, or vendor or purveyor of milk, or of any dealer in cattle, or farmer, or person in possession of cattle, whatsoever, within those parts of the United Kingdom to which this order refers, or if at any time hereafter, while this present order shall continue in force and unrevoked, any animal, being in the possession or custody of any such person as aforesaid within the last-mentioned parts of the United Kingdom, shall be seized or attacked with, or be found labouring or suffering under, any such disorder, notice of the existence of such disorder, or of the first appearance of such disorder in or among the animals belonging to, or in the custody of, any such persons as aforesaid, shall immediately thereupon be given by the person in whose possession or custody such diseased animals or animal shall be, if such person shall reside within any corporate town, to the mayor or other principal officer of the corporation, or, if elsewhere, to the clerk of the justices acting in and for the petty sessional division of the county, or district in the nature of a county, in which he resides; and upon receipt of such notice, or upon any other information which satisfies him or them that such disease has appeared within his or their jurisdiction respectively, it shall be lawful for such mayor, or other principal officer, and for the said justices, if he or they shall think fit, from time to time to appoint some veterinary surgeon, or other person duly qualified, to be an inspector, for the purpose of carrying into effect the following rules and regulations within the corporate town or petty sessional division for which he shall have been appointed, and the same authority may, from time to time, revoke such appointment.

"4. Every such inspector shall have the power of entering upon and inspecting any premises in or upon which he has reason to believe that there is any animal labouring under such disease, from time to time, as often as he may think necessary."

The 5th, 6th, 7th, and 8th rules in the second order are the same as the 3rd, 4th, 5th, and 6th rules of the first order.

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

A monthly meeting of the council of the society was held at Douch's Railway Hotel, Taunton, on the 11th Aug., under the presidency of the Right Hon. the Earl of Portsmouth. There were also present Sir J. T. B. Duckworth, bart., Colonels T. D. Acland, M.P., and H. A. F. Luttrell; Drs. Brent and Gillett; Messrs. D. Adair, G. H. Andrews, R. G. Badoock, W. A. Bruce, C. and R. H. Bush, T. Danger, J. T. Davy, J. Daw, F. H. Dickinson, E. S. Drewe, R. Dymond, M. Farrant, H. Fookes, J. Fry, John and Jonathan Gray, J. Gould, R. N. Grenville, M.P., J. D. Hancock, T. Hussey, H. P. Jones, R. K. M. King, J. E. Knollys, J. Lamb, H. G. Moysey, S. Pitman, G. S. Poole, W. Porter, W. A. Sanford, J. W. Sillifant, and W. Thomson; H. St. John Maule (Secretary), and J. Goodwin (Editor).

THE CATTLE PLAGUE.

Before the regular business of the day commenced, Colonel ACLAND, M.P., drew attention to the importance of taking some steps in reference to the visitation commonly known as the cattle plague, which is causing so much alarm in various parts of England. Through the exertions and instrumentality of Mr. Daw, by whom the arrangements had been projected and matured, a meeting had been held at Exeter on the previous

day, when a District Cattle Assurance Association had been formed, and a committee, comprising several members of the council of this society, had been appointed with Mr. R. R. M. Daw as their honorary secretary: at the instance of that meeting, he (Colonel Aeland) had undertaken to bring the subject under the notice of their council at their present meeting. Mr. Sanford, also, one of their vice-presidents, had specially come among them for the purpose of calling their attention to the subject.

Mr. Daw (Exeter) said the proper way to cope with the evil would be by prompt action in local areas, and he thought it highly desirable that a Mutual Protection Society should be established, in every Poor Law Union in the counties comprised within the Society's area of operations, for the very simple reason that the area of a Poor Law Union was quite large enough for the distribution of insurance risk, and quite as large as consistent with promptitude of action. At the Exeter meeting on the preceding day they utterly repudiated the idea of treating the matter in the form of a county movement, and at one of the largest meetings ever got together in the Guildhall, they had resolved to establish a Mutual Insurance Association, confined to a district coincident with the area of St. Thomas' Union, believing that that would be the best means of dealing with the evil, and leaving the residents in the other unions to follow their example. Hence it was that they had refused to allow several large stock owners in different parts of the county to become insurers in the Exeter District Association, but rather recommended them at once to form associations in their own immediate neighbourhood. This course of action was the more essential because of the peculiar nature of the disease. The Association would be managed by a committee, of which every insurer of 20 bullocks would be eligible as a member, but it would also include persons of influence and intelligence, who, though not actually owners of stock themselves, might choose to show their interest in the objects of the Association by subscribing as though they were. In the event of any animal being affected, the first step would be to call in an inspector, who would have power to order its immediate destruction; and two practical men having assessed the value of any animal so destroyed, its owner would receive two-thirds or three-fourths of the amount as might be agreed on in the conditions of the Association. It must be obvious that in small areas the affair would be much more manageable than in more extensive districts.

Ultimately a committee was appointed to collect and disseminate information on the subject of the disease, and with authority to communicate with the Chairmen and Clerks of the Boards of Guardians in the several Unions in the six western counties, with the hope of calling the attention of agriculturists throughout the district to the importance of adopting due precautions against the spread of the malady.

A motion to memorialize the Government to adopt additional precautions at the outports, in accordance with the suggestions of Mr. Andrews at an earlier stage of the meeting, was negatived by the casting vote of the Chairman.

A meeting of the Committee appointed to collect and disseminate information on the subject of the Cattle Plague was held at Douch's Hotel, Taunton, on Saturday, Aug. 12th, immediately after the rising of the Council. The members present were Mr. E. A. Sanford, in the chair, Col. Aeland, M.P., and Mr. Daw.

The following form of letter to the Chairmen and Clerks of Boards of Guardians in the Poor Law Unions in the counties of Somerset, Devon, Cornwall, Dorset, Wilts, and Gloucester was settled and approved, and ordered to be signed by the Hon. Secretary and Secretary:

"THE CATTLE PLAGUE.

"Bath, August 14th, 1865.

"Sir,—We are directed by the Council of the Bath and West of England Society to communicate to you their opinion that an association for the mutual protection of agriculturists should be established within the area of each Poor Law Union, in consequence of the cattle plague having appeared in the west of England. We have the honour to request that you will be so kind as to take, with the utmost promptitude, such measures as you may deem most suitable to submit the consideration of this question to a meeting representing the different parishes of your union.

"We beg to inform you that such an association has been established for Exeter and the St. Thomas's union surrounding that city. The rules adopted by that association shall be forwarded to you without delay.

The Council have appointed a committee to collect and disseminate information on this important subject; and we are directed by that committee to furnish you with a copy of a circular which has been suggested to the Council as likely to be productive of good effects in arresting the progress of the disease.

"We have the honour to be, Sir,

"Your obedient servants,

"H. ST. JOHN MAULE, Hon. Secretary.

"JOSHUA GOODWIN, Secretary."

The following letter has been received from the Clerk of the Privy Council, by the Secretary of the Bath and West of England Society:

Privy Council Office, Whitehall, 17th August, 1865.

SIR,—I am directed by the Lords of the Council to acknowledge the receipt of your letter of the 14th inst., communicating the opinion of the Bath and West of England Society for the Encouragement of Agriculture, Arts, and Commerce, that an association for the mutual protection of agriculturists should be established within the area of each poor law union, in consequence of the cattle plague having appeared in the West of England, and enclosing a copy of a circular issued by the society; and I am to state that their lordships highly approve of the efforts made by the society with a view to prevent the spreading of the disease, and they trust that the judicious suggestions made by the society will be extensively adopted.

I am, sir, your obedient servant,

ARTHUR HELPS.

The Secretary of the Bath and West of England Society for the encouragement of Agriculture, Arts, Manufactures, and Commerce.

THE NEW OFFICERS.

At the meeting of the Council held at Taunton on Saturday last, Mr. H. St. John Maule, who at a former meeting of the Council had resigned the office of secretary, was elected honorary secretary; while Mr. J. Goodwin, who will still continue to edit the society's Journal, was elected secretary in succession to Mr. Maule: and Mr. Spackman, land agent and surveyor, Terrace-walk, Bath, was elected to the office of official superintendent or director of the show-yard. The business of the Society will henceforth be conducted in offices devoted to that purpose exclusively, a course rendered absolutely necessary by the annually increasing magnitude of the Society's operations.

AN EFFICACIOUS REMEDY FOR THE CATTLE DISEASE is tar-water, made of the best Barbadoes tar, and capsicum. Boil one ounce of capsicum in four gallons of water. When the decoction has cooled down to 100 degrees of heat, pour the same on one gallon of tar, stirring it well ten or fifteen minutes with a flat stick. Let it stand twenty-four hours or more. Then pour off the liquor, and administer to each beast from one to one-and-a-half pints, three times a day, until the whole four gallons are taken, which seldom fails in performing a cure. Smear a little tar on each nostril, and upon every foot, and between each hoof. The cattle-houses should be well cleaned and lime-washed, and the mangers and cribs painted over with hot tar, that which has been used for making the tar-water being sufficient for that purpose. The same, being burned in the cattle-houses, corrects the air in them; but this should be done when they are empty, ere any hay or straw is placed in them, to avoid the risk of fire. Bran-mashes, with a little oatmeal gruel, sweet hay, or sliced turnips may be used as diet, with pure water, and a small quantity of common salt therein. Keep the bowels moderately open with an occasional dose of castor oil and a table-spoonful of sweet spirits of nitre. This is a cheap, safe, and efficacious remedy. Good ventilation, combined with proper drainage for conveying the excrement away through pipes or brick tunnels, is absolutely necessary, to prevent the effluvia arising from contaminating the surrounding atmosphere and spreading distemper amongst the inhabitants, as this is a contagious disease, that ought to be immediately arrested, or direful consequences will be the result.—Weedon House Aug. 26.

PRUSSIAN OFFICIAL REPORT ON THE CATTLE PLAGUE.

The Berlin official *Annalen der Landwirtschaft* publish the following "extract from a report" drawn up by two physicians who had been despatched to Russia by the Prussian government in September, 1864, to inquire into the state of the cattle plague then raging in some of its provinces:

"The findings received from Russia of an epidemic disease which, travelling from east to west, had during the last three years shown itself in men and animals, especially horses, prompted the Prussian Government to despatch Herren Winkler and Dressler, two veterinary surgeons, to Russia in the September of last year, for the purpose of collecting on the spot scientific information as to the cause and nature of this epidemic.

"The Siberian plague, 'Yasva Sibirskā, or Schelvalki,' which by former Russian physicians was called the 'black sickness,' or the 'plague of boils,' but is now known in the scientific world by the name of 'pustula maligna,' 'carbunculus,' and 'lienitis,' was most prevalent in 1864 in the well-watered low lands near Lakes Onega and Ladoga, and along the rivers Nawa, Ocka, Wolchoff, Tscheckona, Malloga, Kyasma, Kuma, Wyatka, and Volga. The flat level plains, extending along these rivers, consist of meadow and pasture land, with a marshy and sandy soil, partly overgrown with low shrubs, and partly with pines and Scotch firs. However carefully you may seek, there is not a trace to be found of an artificial canal anywhere, and as the natural watercourses do not descend in a body of sufficient force, the water remained in a state of stagnation, causing the meadows to resemble more nearly enormous swamps than useful healthy pasture land. Only here and there do the larger rivers, where the shore is tolerably elevated, burst through the impediments opposing their course. Almost without exception the water of these rivers and canals is of a dark brown muddy colour. Hence there is also a very insufficient supply of pure water for drinking; wells of even the most simple construction are scarcely ever to be seen. The ships on these waters are drawn by horses, and as there is a pretty considerable traffic along the principal streams, many horses are constantly employed in this trying sort of work. Notwithstanding this, however, the shores of the streams are not in a condition to justify their being used for this purpose. The towing-path is alternately a villainous stone pavement or a muddy pool, materially increasing the labour required of the horses.

"The cultivated portions of these plains and those used as pastures for cattle are extremely small in comparison with their extent. Even the larger landed proprietors are of opinion that cattle of themselves bring in no material profit, but must be kept for the sake of the manure only. The cultivated tracts are lost amid the interminable plains of meadow, pasture, moor, and forest. Scarcely the tenth part of the surface is appropriated to agricultural purposes, although the soil from its chemical and physical properties, being composed of a most excellent and rich black earth, would yield a most profitable return. Indeed, on comparing this territory with similar tracts of land in Germany, the idea involuntarily presents itself that as yet the inhabitants are mere children, and have not got even through the A B C of culture.

"These low lands are only very scantily inhabited, the villages and estates, with the exception of those along the shores of some of the principal streams—as, for example, the Wolchoff—lying at a great distance from each other. The houses, which in the villages are chiefly of wood, are built quite close to each other in a double row, and two storeys high. Some few look tolerably comfortable, but mostly they are made to face any and all directions, bearing no signs of ever undergoing repair, though wood is left to rot along the roads. Even in the towns—as, for instance, Tver, on the Volga, where we changed horses—the small inns, having large courtyards and extremely roomy but low-roofed coachhouses, were almost rendered inaccessible by insurmountable masses of filth. In the stables there was a superabundance of dung. Altogether, agriculturists in Russia are at a very low ebb of civilization. With some few good qualities, there still prevails among them

extreme ignorance, superstition, barbarism, disorder, and uncleanliness. As they religiously observe every holiday in the Russian church, they sink into idleness, and consequently into poverty. The possession of large estates is not a guarantee of intelligence and economy in their management; there is no such thing, as with us, of the beneficial influence which a large enterprising landowner exercises over the smaller ones, by trying new experiments and introducing agricultural improvements.

"Although men and animals live in close proximity, kind feeling for the domestic creatures reaches only so far as is rendered indispensably necessary. So long as the country is not covered with deep snow they must seek their sustenance for themselves in the large meadows; consequently, they at times live in the enjoyment of great abundance, and at others with difficulty find the means of subsistence. In like manner domestic animals must slake their thirst wherever they can. This they do in the muddy water on the shores of the rivers, or in the hollow tracks left by the cattle. Proper troughs for cattle are not anywhere to be seen. In the winter they find but slight shelter from the snow and inclement weather in the ill-kept courtyards, in sheds, and in narrow dark places, where very insufficient food is given them, as the owner of cattle never aims at possessing anything like an adequate supply of winter provender. No sooner has the sun melted away the snow than the cattle are driven to the pastures, still inundated with water, where, exhausted by the starving process of the winter, they speedily consume what has been left from autumn, as well as the first buds of spring, which the rapid vegetation of that country quickly develops. As the herbage grows the temperature increases in warmth, and the exhausted animals have not sufficient stamina to oppose to the great extremes of heat and cold which day and night offer. Added to which, double work is required of the horses; for, on the one hand, there are the labours of the field which spring always brings with it, and which are universally done by one horse at a time, and, on the other hand, the rustics undertake to tow the numerous barges along the wide swampy rivers, and often against tide. These heavy vessels, which are nearly square, looking more like oblong chests than ships, and demanding in their towage an enormous waste of strength, carry as much as 40,000 cwt., and are laden with corn, stones, bricks, hay, and wood. The hard work of towing continues the whole day without abatement, and this for many days in succession, while during the short night, with heavy dews falling, the weary animal has to seek his food for himself. The work they have to perform is oftentimes so fatiguing that the poor creatures barely progress at a snail's pace, being only capable of putting one foot before the other, and requiring to be continually goaded on. Even loose horses find it difficult in autumn to overcome the difficulties which these unmade roads occasion. On September 29, when the authors of this report were travelling in the country, 2,000 horses were still engaged alone in towing the barges along the canal of New Ladoga to Schlüsselburg. On the Volga, near Tver, where a very active navigation and traffic prevails, each barge, mostly laden with hay and corn, had ten horses in a row to tow it along, while three men on foot, furnished with shrill whistles of a peculiar construction, were urging the animals to exert themselves to the utmost. A still greater strain is put upon such horses as are conveyed in the vessels themselves, sometimes to the number of 50, and who have to keep on at the labour for months together. Of these, 12 and more work at the same time at one single crank, to get the slip away by means of anchors sunk at a distance.

"The cattle have still less consideration shown them than the horses. Fewer of them are bred, as they are comparatively less profitable. Sheep and swine, which supply the population with food and clothing, live with the moujiks, enjoying perfect liberty, but also exposed to the pernicious influences of the unhealthy climate.

"SPREAD OF THE YASVA.

"As early as the beginning of the 18th century the Yasva,

as stated in ancient documents of the Church, occasioned processions through the streets and prayers in the churches. To the same end a statue was erected at Tobolsk to St. Nicholas, which afterwards began to work wonders, and attained great fame among the orthodox. A little later, Pallas, Gmelin, Renovatz, and other scientific travellers collected more reliable information on the subject. Since 1740, when Gmelin discovered the first traces of the malady on the banks of the river Irtysh, where it had been prevalent long before, it has been a permanent scourge of Western Siberia, breaking out every year in the hot season, and chiefly killing men and horses. Sometimes more, sometimes less violent, it gradually spread beyond its original home, following in its course the rivers Irtysh and Tobol, as well as their tributaries, and affecting alike high lands and low lands, sand and swamp, and, indeed, every sort of soil and geographical situation. All domestic animals without distinction were liable to be attacked by it, but its most numerous victims were horses and men. Its appearance always followed closely on the advent of the hot season; cold weather, or a refreshing rain, as it counteracted the ravages of the mediæval plague, equally put a stop to the Yassa. In 1798 the Yassa, advancing further west than ever before, reached the Caspian Sea and Ukraine, penetrating at the same time as far as the White Sea in the north, and even showing itself in Lithuania and on the Russian shores of the Baltic. In the first half of this century the disease continued to exist in its original haunts, and, slowly progressing towards the east, made its appearance in the more remote districts of Siberia, as far as the Chinese frontier. In 1823 it visited the provinces of Kasan, Cherson, and Taurida, where it had never shown itself before, and raged at Charkow, Kasan, and all along the lower course of the Volga; but it is only in the last three years that it advanced again in a westerly direction, and infecting all the country from Astracan to Lithuania and Vitebsk, reached St. Petersburg, Olonetz, and the shores of the White Sea. Its principal victims on this latter occasion were horses; next, in point of numbers, came cattle; then sheep, swine, and, as the last in the scale of suffering, men. In some places all domestic animals were liable to be attacked; in others, horses and cattle only.

According to official, though, perhaps, not quite reliable statements, the number of horses alone that perished of this malady in 1864 amounts to 72,309; but the loss is popularly estimated at 100,000. Of cattle 60,000 head succumbed in the same year. Looking at some of the provinces infected, we find 26,000 horses to have died in Novgorod, 12,000 in Yaroslav, 4,860 in Olonetz, 4,109 in St. Petersburg, 4,000 in Tver, and 2,182 in Vologda. In six districts of the Province of Novgorod 13,888 horses, 4,300 cattle, and 2,308 swine and sheep died, while only 1,059 horses, 578 cattle, and 95 sheep and swine that had been attacked by the malady were saved. In some parts of the district of New Ladoga all horses employed in dragging barges were carried off; in other parts there were but few deaths, in some none at all.

According to the same official sources, 938 persons were attacked by the yassa in 1864, of whom 302 died. In the above-mentioned six districts of the province of Novgorod, the number of deaths amounted to 207, and the number of persons saved to 360.

No doubt the weather was particularly active in spreading the yassa in 1864. There had been much snow in the winter, but spring was late, and when it came at length rather hot. The snow then passing away rapidly, the water inundated the lowlands, and a luxuriant vegetation sprung up from the combined influence of heat and moisture. The air was close, oppressive, and impregnated with noxious miasmas. In the beginning of June the temperature rose on the banks of the Upper Volga to 30 degrees of Réaumur in the shade, while the nights were cool, and, in consequence of the over-charged state of the atmosphere, wet and dewy. Thus all tended to promote the spread of the murrain. On the 12th of June it broke out in the province of Vologda, on the 17th in the province of St. Petersburg, on the 22nd in Vladimir, on the 25th in Olonetz, on the 26th in Tver, on the 27th in Kostroma, on the 9th of July in Yaroslav and Orel (where it ceased of itself after a week's duration), on the 26th in Wilna, and on the 27th in Moscow. It reached its climax from the 20th to the 28th of June, when the heat was at its height. On the temperature becoming cooler, the malady rapidly decreased, and in some localities disappeared altogether. From the 14th of July the

heat began to increase again, and with it the plague; but from the 20th, when a heavy rain purified the air, few or no fresh cases occurred. In September, when the authors of this report were travelling in the provinces that had so much suffered from it, the disease had already died away.

"DIFFERENT KINDS OF YASSA.

There are two kinds of yassa, generally speaking, which may either occur separately, or both at the same time, and in the same locality. In the later case a variety of intermediate stages have been observed by the physicians. The yassa is either an acute or apoplectic disease, when it kills its victims very rapidly; or it is chronic, when it is called diptheritic, or exanthematic, from the boils and swellings accompanying it.

The apoplectic kind kills the animal in an hour and less. The animal suddenly begins to tumble, looks dull and stunned, cannot stand fast on its legs, breathes heavily, now and then emits a strange, half-involuntary sound, falls prostrate on the ground, and dies with or without spasms. As a rule no boils or blisters have been noticed in cases of this nature; though when death was a little longer delayed than usual incipient pustules might be discerned on the skin. The apoplectic kind is the rarer of the two, and always fatal.

The exanthematic kind does not necessarily end in death. It begins with sudden and painful shiverings, which, after the lapse of an hour, are followed by the appearance of small pustules chiefly on the withers, breast, belly, udder, and penis, or, more rarely, on the ribs, hind legs, and crup. These pustules rapidly increase in size, penetrating deep into the cellular tissue. They are neither very hot, nor particularly painful; sometimes elastic, and allowing of being moved this way and that way with the skin, sometimes hard, fast, and sticking immovable in the body. On dissecting the animal, they are found to contain decomposed ingredients of the blood. As the pustules grow larger the animal begins to tremble, and becomes feverish and doleful. It stands quite still, with its eyes fixed, and its head hanging down. Notwithstanding the fever and its increasing violence, the appetite does not altogether cease, the normal functions of the body continuing at the same time much as ordinarily. In many cases horses have suddenly fallen to the ground, and died with food in their mouths. Death, which is the ordinary termination of this the milder species of the malady, as well as of the apoplectic one, ensues always within a fortnight, and, as a rule, without any premonitory warning. Recovery is initiated by a gradual discussion of the tumour, and the peeling off of the inflamed part of the skin, and the infected membrane.

In some cases pustules have not been noticed until after the fever had already continued for some time. This species of disease always brought on death in a few days.

The carcasses become rapidly putrid, emitting a horrible stench. The normal apertures of the body are frequently filled with sanguinary, frothy matter. At the beginning of the disease, the dead animals were frequently allowed to remain where they had breathed their last; or they were thrown into the rivers, and, being washed up to the banks, deposited in some stagnating pool by the current, whence they filled the air with pestilential vapour. It is said that St. Petersburg remained free from infection until a very large number of dead horses had been floated up to one of the metropolitan islands by the waters of the Ladoga Canal.

The *post mortem* examinations of apoplectic animals showed abnormal secretions of blood in the cellular tissue, and near the lungs, the liver, and the spleen, which latter organ was very soft, spongy, dark-coloured, and turgid. The secretions were of a dark red colour, and mostly clotted.

In cases of exanthematic yassa, the pustules were frequently of enormous size. At the bottom of the pustules there was always some yellowish sedimentary matter, which penetrating into the body from its outer circumference, pierced its texture, and even got as far as the great internal cavities and the organs disposed in them. The fat had always entirely disappeared, having been changed into that yellowish, sedimentary matter; and the blood was dark brown, like tar, and in most cases serous. The organs of the abdomen were full of dark-coloured blood and soft and spongy in texture; spleen and liver in the same condition, as in the cases of apoplectic yassa. If the seat of the pustule were in the pectoral cavity, the heart and lungs were similarly affected.

"There was little difference between the symptoms evinced by the carcasses of horses and cattle. Sheep are generally affected by the apoplectic form, and there is nothing reliable known as to the yasva of the swine.

"Among the human part of the animated creation the male sex is more liable to the disease than the female. In this case the symptoms of the malady, occasioned or manifested by the yasva pustule, are identical with those of the well-known disease, *pustula maligna*. Acute pain first indicates the spot where the pustule is to appear. A swelling of the skin ensues, and there is a reddish hue noticeable on and near the spot mentioned. At length a red point becomes visible, expanding gradually into a bluish blister, varying in size between a pea and a threepenny piece. These blisters have been observed on the face, throat, breast, arms, legs, hands, and feet. If there are but few blisters, and if they are small and confined to the arms, hands, and feet, the general state of the patient remains tolerably good, and the inflamed portion of the pustule being segregated from the rest, and falling off in course of time, recovery follows as a rule. In case of numerous blisters studing, however, the face and upper parts of the body, the state of the patient becomes feverish and typhoidal. A painful enlargement of the tumours is accompanied with headache, giddiness, and nausea, and death takes place after a few days, or even hours, in consequence of a putrid decomposition of the blood.

"It has been asserted by many peasants and village doctors in Russia that the contagion is not always communicated to man by animals, but will also attack men and animals at the same time. The fact might be accounted for easily enough by assuming the atmospheric and other local influences at work to poison the human as well as the animal organism under certain circumstances; and there are, indeed, cases recorded where the number of men and women infected exceeded that of the horses, while in other places human beings are said to have caught the infection long before the animals. As a rule, however, the contrary was the case.

"THE CAUSES AND CONTAGIOUS NATURE OF THE YASVA.

"As we have seen, the primary causes of the Yasva must be sought in a variety of circumstances, peculiar to the locality—the low state of culture and civilization in those easterly parts; the many stagnating rivers and swamps evaporating noxious miasmas, and converting the air into a most injurious and oppressive sort of malaria atmosphere; the bad water used for drinking; the sudden advent of summer, and the rapid change of the weather from cold to warm and from warm to cold; the wet and swampy grasses eaten by the animals after the dry and scanty fodder given them in winter; and the excessive work to which the horses are put when the large-dragging and agricultural season begins—all these are so many circumstances which cause the animals to catch cold very frequently, and which, by deteriorating the normal condition of the blood, increase their disposition for the prevailing disease. To these must be added the peculiar tendency of the Russian horses to suffer from congestions of the skin, a disorder frequently attended with the bursting of veins, or causing the animal to tear open with his teeth the vessels of the skin when heated. This tendency is nothing but the consequence of the want of proper cleanliness, and often ceases when the horse is tended and curried, as is the custom in other countries. Nothing, therefore, being more frequent than a sick, sensitive skin and the loss of blood from the capillary veins, we need not doubt that this is the very reason of the pustulous or exanthematic form of the plague committing such ravages among the poor neglected beasts.

"The plague being already extinct when the authors of this report were travelling in Russia, they had no means of testing the different opinions on the contagious nature of the Yasva. The majority of the peasants and village veterinarians, supported by some of the learned doctors, contend that the disease is not contagious. Sick and healthy cattle, they say, had been frequently kept together without the latter being infected; and the village veterinarians who had never dreaded touching diseased animals, even though their hands might have happened to have open wounds and sores, had done so with impunity. Other peasants are, however, convinced that the contrary is the case, and that the disease is propagated by its victims. They observed, however, that in some places the plague did not break out until after the return of the horses from the river work, and that the cattle and other animals caught the infec-

tion from the horses. As to the experience of medical men, it undoubtedly goes to prove that persons attacked had come into frequent and habitual contact with sick and dead animals; that they had been engaged in curing or otherwise preparing for sale their hides, hoots, and horns, or that they had only transported these articles from one place to another, or touched the stable utensils of diseased herds. As a rule, where the intellectual condition of the peasants was lowest, the Yasva was most virulent among cattle and men; although it is but right to add that precautionary measures might have been more stringently enforced in most parts of the realm. Horses, for instance, although diseased, and sure to die within a few days, were put to work all the same, and frequently expired in harness. In the neighbourhood of St. Petersburg many hides of diseased horses were sold to the tanners and curriers, which led to their men being infected in great numbers, and not a few carried off by the disease. On the other hand, it is equally undeniable that persons were taken ill and got pustules who had never come into contact with diseased animals; that hospital attendants, whose duty it was to nurse a large number of the sick, were not infected; and that in some places a single animal would be attacked without propagating the contagion among the others.

"Wasps, infusorias, and a variety of harmless insects have been charged with spreading contagious matter, and it is not altogether improbable that the poison, in some cases, may have been communicated by the sting of a bee, or some other tiny animal of the kind. Indeed, some person would assert they had been stung by insects on the very place where the pustule subsequently showed itself. Suspicion principally attaches to the stinging and sucking species of breeze-flies, such as *Tabanus* and *Stomoxys calcitrans*, and the mischievous gnat of Kolumbatz (*Rhagovalbum Caccensis*), which at times will appear in swarms in swampy localities.

"THE CURE OF THE YASVA, AND SANITARY MEASURES TAKEN TO PREVENT ITS SPREAD.

"The apoplectic species of the malady leaves no time for cure, and the means employed in cases of exanthematic Yasva are, as a rule, without effect unless applied at a very early stage. People used to cut open the pustules when forming, to burn and cauterize the wounds with sulphuric acid and sulphate of trali; to apply cataplasms of dough, linseed, hayseed, and tobacco leaves impregnated with sal ammoniac; and also to keep the wounds cold, and put ice on them, if possible. In some cases peasants would apply ants' poulitices, or foment the tumours with hot bricks and stones, so as to slightly burn the skin. Embrocations with a mixture consisting of 1-9th of creosote and 8-9ths of turpentine are also recommended as useful. Men and women have been frequently benefited by applying poulitices saturated with vinegar of saturn and spirits of sal ammoniac in equal proportions directly the skin became painful and a tumour visible.

"As a precautionary measure it was formerly prescribed to kindle large fires, the smoke of which was intended to kill noxious insects and warn off travellers.

"On the late appearance of the epidemic in Western Russia, 80 veterinary surgeons—a large number, when the scarcity of professional men in the country is taken into account—were sent to the infected provinces by Government. But although instructed to offer assistance and medicine gratis, their activity was not attended with any remarkable result.

"We may also mention that it was only after the plague had been raging for some time, that people were ordered to bury the carcasses at once, and in deep pits.

"The supervision of domestic animals by Government physicians, as exercised in the ordinary routine of business, is no guarantee against the spread of contagious diseases. A herd is simply driven past a Government physician, counted, and the number compared with that mentioned in the passport. How, then, is it possible for the physicians to distinguish the sick from the healthy? The authors of this report heard a woman say that she had washed off the purulent matter from the nose and eyes of an infected cow just before the arrival of the medical man. In no case have diseased animals been killed by order of the Government, or indemnification offered to owners who should kill them of their own accord.

"We believe ourselves justified in inferring from the above that the Yasva is not a new and distinct malady, but only a peculiar species of the well-known Lienitis, or inflammation of

the spleen, which has been frequently witnessed in Europe and America under local circumstances similar to those of the Russian plains. The authors of this report had the satisfaction of seeing their view of the case adopted by Herr Haupt, the

famous chief veterinary surgeon of the Government, who, having represented the Yawsra as a distinct malady in his work on epidemics among animals, after rediscussing the subject with them, now classes it with Lientis.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR AUGUST.

Although the temperature has been tolerably high, the progress of harvest work in all parts of the United Kingdom has been very slow. Immense quantities of rain having fallen, the grain has remained in the fields some time after being cut, and much of it has been carried in a damp state. The wheat trade has, therefore, shown signs of firmness, and an advance of from 2s. to 3s. per qr. has taken place in the quotations. At that amount of improvement, however, the business doing has been only moderate. Millers generally are aware that the stocks of old wheat on hand are large, and that very extensive supplies of foreign have been purchased for immediate shipment to England. It is, however, very evident that for several months really fine wheat will be comparatively scarce and high in price, although it is admitted on all hands that the yield of the new crop as to quantity is nearly, or quite equal to last season. Nearly the whole of the growth of barley has been secured in our forward districts. The yield is certainly a full average; but most of the samples show a great want of quality; hence, fine parcels have been held for more money, and enhanced rates are anticipated during the coming season. The produce of the oat crop is even smaller than was at one time anticipated. We shall therefore be chiefly dependent upon supplies from abroad to meet the consumption. Beans and peas are a very middling crop, though certainly larger and of better quality than last year.

From the above remarks it is obvious that both wheat and barley have seen their lowest range for some time; but we are not prepared to say that there will be any excitement in the demand. Continental and American advices are opposed to any great activity in the trade. The produce of the crops is represented as large, but not of very fine quality. The prices at which it is offered are considered low, and we could be readily supplied with wheat at rates which would leave a fair margin of profit in this country.

The crop of potatoes in almost every county is proving unusually large, and, with some few exceptions, wholly free from disease. The great abundance of the growth, and the low prices, 50s. to 100s. per ton, at which it is offered, must to some extent have a controlling influence upon the value of the better kinds offered. On the continent the crop is certainly not equal to some former years. The probability is, therefore, that the importations during the winter months will be on a very moderate scale.

The turnip crop is a partial failure; but, where successful, it is very large. Swedes, mangolds, &c., promise the largest return ever known; indeed it is doubtful whether they can possibly be consumed, owing to the small numbers of stock in the country.

It is a fortunate circumstance, however, that the supply of food is large at a time when butcher's meat is very high in price. An abundance of keep will tend not only to fatten the stock somewhat rapidly, but likewise to allay the present excitement caused by the spread of disease in various localities. The great abundance of food will, likewise, materially lessen the feeders' outlay for linseed and cake.

Notwithstanding that the heavy rains have produced mould in some localities, the growth of hops in Kent, Sussex, &c., is likely to turn out unusually large, and of good quality. New qualities have been disposed of in the Borough at from 140s. to 150s. per cwt. As the stock of olds and yearlings is nearly exhausted, present rates are considered safe for fine parcels.

The advance in the Bank rate for money to four per cent. has somewhat checked the demand for English wool; nevertheless very little change has taken place in the quotations. The public sales of Colonial qualities, which, in the aggregate, will amount to nearly 140,000 bales, have progressed steadily.

Really fine qualities have changed hands freely at full prices, although the demand on continental account has been inactive when compared with the previous series. Inferior and faulty wools have given way 0½d. per lb. The improved demand for woollen goods in America is likely to bear considerable influence upon our manufacturing trade for some time.

The first cut of hay has at length been secured. It has certainly exceeded last season, and the second cut in the southern and eastern districts has been somewhat heavy. Meadow hay has sold in London at from £1 15s. to £6 10s., clover £5 to £7, and straw £1 8s. to £2 2s. per load. The pastures have presented a most luxuriant appearance, and much difficulty has been experienced in keeping down the grass.

The crop of apples is a partial failure, but the growth of most other kinds of fruit is very large. The deficiency in the crop of apples will be severely felt in our cider districts.

In Ireland fair progress has been made in harvest work. Wheat and barley are about average crops, but other produce presents a deficiency. The various markets have been scantily supplied with grain, for which the demand has ruled steady on rather higher terms.

The harvest in Scotland is tolerably forward, much less rain having fallen than in England, and most accounts agree in stating that wheat, barley, and oats will be fair average crops, though not of fine quality. The growth of potatoes is enormous, and it is expected that very large shipments will be made to the south during the winter. As a whole, the crop is free from disease.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Much excitement has prevailed throughout the country, owing to the spread of disease amongst cattle in various quarters. Every precaution has been taken to prevent contamination—diseased animals have been seized in large numbers, and inspectors have been appointed with adequate powers to condemn meat unfit for human consumption. The losses amongst the cows in the metropolitan dairies have been serious, and it has been found necessary for the Privy Council to stop the export of cattle to Ireland. These precautions have certainly become necessary, because we do not hesitate to say that the new disease which we term gastric fever is an importation from the continent. We do not suppose that the import of foreign cattle will be prohibited; but our advice to the graziers is, not to purchase foreign store animals for grazing purposes, and to the dairyman, to avoid mixing foreign cows with English breeds, although they may give an immense quantity of milk. If our views are carried out we shall hear very little more of disease in any quarter.

Fair average supplies of beasts have been on sale in the London market, but at least two-thirds of them have been beneath the middle quality. Prime Scots, Devons, Herefords, shorthorns, &c., have changed hands freely, at very full prices. All other kinds have moved off heavily, on rather lower terms. Foreign store beasts have been offered as low as 2s. to 2s. 6d. per 5lbs.

The numbers of sheep brought forward have been moderately good, but mostly in poor condition. Prime Downs, half-breeds, &c., have sold freely, at enhanced quotations, and even the most inferior breeds have realized extravagantly high rates. The lamb trade has been devoid of animation; nevertheless, prices have been supported.

In the value of calves very little change has taken place; but pigs have produced more money. The prices paid for the latter in some parts of the country have been unusually high.

The imports of foreign stock into London have been as follows:—

	HEAD.
Beasts	16,536
Sheep	54,333
Lambs	6,727
Calves	3,287
Pigs	8,251
Total	89,134

COMPARISON OF IMPORTS.

	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1864	11,475	39,114	2,716	2,786	4,326
1863	9,502	34,937	4,125	4,327	4,108
1862	5,630	30,652	5,204	2,060	3,297
1861	6,551	32,210	3,176	1,874	3,718
1860	6,647	38,249	1,856	2,520	4,075
1859	6,502	29,175	3,308	3,254	1,805
1858	8,293	19,500	2,764	3,512	2,935
1857	4,692	21,215	1,760	2,661	2,322
1856	5,677	17,801	1,271	2,301	1,901
1855	5,341	22,605	984	2,484	3,476

The total numbers of stock exhibited in the Metropolitan Markets were as under:—

	HEAD.
Beasts	29,600
Cows	170
Sheep and lambs...	147,520
Calves	3,828
Pigs	2,175

COMPARISON OF SUPPLIES.

	Beasts.	Sheep and Lambs.	Calves.	Pigs.
1864	29,420	154,300	3,426	3,046
1863	26,264	149,430	3,070	2,622
1862	24,072	151,920	2,354	3,012
1861	23,420	159,740	2,952	3,229
1860	22,290	151,500	3,346	2,070
1859	23,170	165,090	3,322	2,320
1858	26,915	151,530	2,127	3,510
1857	20,695	143,755	3,173	2,450
1856	21,271	147,250	3,354	2,875
1855	20,816	151,870	3,356	4,272

This district supplies thus compare with the two previous years:—

	Aug., 1863.	1864.	1865.
From Lincolnshire, Leicester-shire, & Northamptonshire	14,000	12,500	9,520
Other parts of England	4,000	3,700	3,000
Scotland	101	133	739
Ireland	560	297	520

The comparison of prices stands thus:—

	Aug., 1860.		Aug., 1861.		Aug., 1862.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef from	3 0	5 6	2 10	4 10	3 4	4 10
Mutton	3 8	5 6	3 2	5 4	3 8	5 4
Lamb	5 4	6 6	5 0	6 0	5 0	6 4
Veal	4 2	5 6	3 4	4 6	4 0	5 0
Pork	4 0	5 0	3 10	4 8	3 8	4 10
	Aug., 1863.		Aug., 1864.		Aug., 1865.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef from	3 4	4 10	3 4	5 0	3 0	5 6
Mutton	3 6	5 2	3 10	5 4	4 4	6 8
Lamb	5 0	6 8	5 8	6 8	6 0	7 0
Veal	3 4	4 8	4 0	5 0	4 2	5 4
Pork	3 6	4 6	3 6	4 6	4 0	5 0

The supplies of all kinds of meat on sale in Newgate and Leadenhall have been very moderate. Prime qualities have changed hands freely, at full quotations; otherwise, the trade has been in a most inactive state. Beef has sold at from 3s. 4d. to 4s. 10d., mutton 4s. 4d. to 5s. 10d., lamb 5s. 4d. to 6s. 4d., veal 4s. to 5s., and pork 4s. to 5s. 4d. per 8lbs., by the carcase.

NORTH LINCOLNSHIRE.

The crops are being rapidly ingathered, although much impeded by the late rains. Sprouted wheat is spoken of freely; and potatoes, in the Isle of Axholme, are said to have suffered

greatly from the rain-storms. Turnips seem to have reaped a peculiar advantage from the wet weather, which after Monday ceased; but, until then, was almost incessant. Mangolds generally look well, especially so on heavy land. Potatoes on the Wolds are in prime condition, and realizing £16 to £17 per acre, to be taken up and paid for in October, with the usual ten or twelve days' grace. The cattle murrain has not at present made a sign in this locality; the railway officials, acting up to the instructions of the Board of Trade, are busily occupied in remedial measures, so far as the transit of stock on their lines is concerned. This is evidently a capital plan. The cattle-trucks are lime-washed, and the dose is repeated after any of them have been used by foreign stock, and in some cases by suspicious-looking animals passing through our own locality. At Hull, which is the chief port for cattle from abroad, and transhipped in our neighbourhood, the authorities are on the alert, and every care is shown by them in the examination of stock, and placing any suspicious-looking beast in quarantine; but at present there has not been any case at all analogous with the Russian rinderpest, and no case indeed calling for any special application for veterinary skill.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASHFORD LAMB FAIR, (Tuesday last.)—The supply was about an average, and for good lots a brisk trade was done at high prices, but very few remaining unsold at the close.

BEDFORD FAIR.—A poor show of fat cattle; those sold made from 11s. 6d. to 12s. per score pounds. Best half-bred wethers made from 8d. to 9d., ewes from 7½d. to 8d. per lb.; good tegs sold at from 35s. to 40s., lambs from 30s. to 32s. each. Small fat porkers made from 7d. to 7½d., large 6½d. to 7d. per lb.

BODMIN FAIR.—The following prices were made: Fat cattle £3 5s. to £3 10s. per cwt., Sheep 7½d. to 8d. per lb. Store cattle made good prices. A brisk sale throughout the day.

BRACKNELL FAIR.—The supply of horned cattle was very large, and in a healthy condition. There was a good demand for fat beasts, which sold at from £18 to £24 each, and store stock for grazing were in request, well-grown steers selling at from £13 to £15, and heifers at £10 to £12. In most instances a warranty was required against existing disease. Among dairy cows there was but little business transacted; for although dairy farms are being greatly increased in this county for the transmission of milk to London, yet the cattle plague, which is so fatal among milch cows, deters country dairymen from buying fresh stock. However, the prices made were from £17 to £22 each. Many droves of lean and store cattle were not sold. In the horse fair there was a good sale for best descriptions of animals, some realizing 35 to 40 guineas.

COCKERMOUTH FAIR.—The general average price given for lambs was 17s. 6d., but 18s. and 19s. a-piece were obtained in some instances. Half-bred Leicesters were sold at 17s. to 25s. each, but went off slowly at the latter figure; the more improved breeds realized 26s. to 32s. each, and several lots were sold. Pure-bred Leicesters were scarce, and sold at 40s. to 50s. each. A sum of £2 15s. was asked for one, but no purchaser was found. Mr. Robinson Mitchell sold a lot of half-bred Leicesters at 24s. 6d. each. There was a small lot of Irish wethers shown, but they were not sold; 50s. each was offered for them, but refused. Ewes were bought at 52s. and 55s. each, but transactions were few. The supply of cattle was confined to a few lots of Irish two-year-old heifers, which realized £6 to £7 a-head. Upon the whole the prices were considerably in favour of sellers, and though buying was not brisk, before the fair concluded a large business was done.

CREDITON FAIR.—There was an average supply of bullocks; sheep, above average. It was a "selling market," and cattle fetched rather high prices. Sheep sold at 8d. per lb.

GLOUCESTER MONTHLY MARKET was moderately supplied with fat cattle. The quality generally was rather inferior, but trade was firm at advanced prices. The supply of sheep and lambs was short, and the demand was consequently active. A clearance was soon effected. The prevailing prices were—Beef, 7d. to 8d.; mutton 8½d. to 9½d.; lambs, 9d. to 10d. per lb.; pigs, 10s. 6d. to 11s. per score.

GRANTHAM FAT-STOCK MARKET.—A small show compared to late markets. Trade brisk. Beef 8s. 3d. to 9s. per stone, mutton 8d. to 9d. per lb.

HINCKLEY FAIR was the duller ever observed in this town. Almost impossible to state the prices given. Fat cattle were sold at an advance of from 1s. to 2s. per score pounds.

IPSWICH LAMB FAIR.—The cattle disease, no doubt, affected both the attendance and the supply. The Corporation had taken every precaution that no diseased cattle should reach the fair. An inspector was stationed at every approach to the field, and on every road, whether highway or by-way. As yet sheep and lambs have been considered safe from the infection; but, nevertheless, there were fewer pens than usual. Trade was brisk among the sheep. Lambs made 35s. to 37s., blackfaced ewes 60s. to 70s. 6d., half-breds 50s. to 60s. Fat beef fetched 9s. to 9s. 6d. per stone.

LANARK SECOND LAMB MARKET brought together a large gathering of dealers from various parts of Scotland, and a few from Ireland and the bordering counties of England. The morning dawned fair, and excepting a shower which fell during the forenoon, the weather was favourable for the transaction of business. The number of lambs was upwards of 16,000, which added to those sold the previous evening, would run up the total show to 20,000 head—the largest number that has been brought forward at the second lamb market for many years. The condition of all the lots was fair, though some were perhaps more unequal than usual, owing to the severity of the winter. In the afterpart of the day blackfaced wether lambs could not be sold at all, and a great many lots failed to find new owners. Blackfaced ewe lambs would be up from 2s. to 3s. on the prices of the corresponding market of last year, and Cheviot ewe lambs from 1s. to 1s. 6d. Blackfaced wether lambs were back from 1s. 6d. to 2s. on the prices of the market held at Lanark a fortnight ago. Cheviot wether lambs also declined in value, and compared with the rates going at Lockerbie last week, they indicated a fall of from 1s. 6d. to 2s. Crosses fetched nearly the same money as at recent markets. Blackfaced ewe lambs sold at from 18s. 6d. to 24s. clad, wether lambs at from 15s. downwards; Cheviot ewe lambs, seconds at from 17s. to 20s., and wether lambs at from 16s. to 22s. each.

LINCOLN FORTNIGHTLY MARKET.—A good show of beasts, but a thin supply of sheep. The former made 8s. 6d. to 9s. per stone, and the latter from 8d. to 9d. per lb.

LUDLOW FAIR.—There was a numerous attendance of dealers; but the number of sheep was not so large as last year. Fat sheep averaged 8½d. per lb. Store sheep sold briskly. The pig market was remarkably high, fat porkers fetching from 6d. to 6½d. per lb. The supply of cattle was comparatively unimportant, this being essentially the sheep-fair of the year. Fat beasts, of which there were very few, realized 7d. to 7½d. per lb. There was a poor show of horses. Cart-horses were sold for £20 to £23 each. Of those of an inferior description but few changed hands.

MARLBOROUGH FAIR.—Most of the pens of ewes and lambs were in prime condition, and met a ready sale, at an advance of from 10s. to 12s. per head on last year, and fully 5s. per head in advance of Britford Fair. There were several strings of good cart-horses, and cobs in great variety. Cows met rather a dull sale; but there were large numbers offered. On the whole, the sale was good, at greatly-enhanced prices.

MARTOCK FAIR.—The attendance was not so large as was expected, owing, no doubt, to the fine weather. There was, however, a good number of fat beasts, which sold well. Sheep and pigs fetched very high prices.

MELTON FAIR.—Owing to the prevailing epidemic, the pitch of beasts was smaller than on any previous occasion. Only few store cattle were offered. Meated beasts were in good supply, and found ready purchasers at very full prices, especially for prime quality. In-calfed beasts were very slow of sale, at reduced prices, none being at present required for the London trade. The pitch of sheep was larger than usual, especially of store lambs, prices for which ranged as high as 40s.

MONZIE LAMB MARKET.—There was a great deficiency compared with the corresponding market last year. The high prices asked by holders in the morning would not be acceded to by buyers, and consequently the day was well advanced before many sales were effected. About ten o'clock sellers gave way a little; and immediately afterwards a consi-

derable number of the best lots were picked up at the subjoined prices: Mr. Hugh McLaren, Dunnichen, sold his best lot of cross-bred lambs at 23s. per head, and seconds at 19s. each. Mr. John Wilson sold the top lots of the Morenish Cheviot lambs at rates ranging from £23 to £25 per clad score. The inferior lots brought prices varying from £16 10s. to £20 per clad score. Mr. Wilson also sold the Claggon lambs, Lochtayside, which consisted principally of blackfaced stock. The top price was about 20s. per head; seconds ranged from 15s. to 18s. each. The current prices of cross-bred lambs ruled from £20 to £22 per clad score. Blackfaced lambs formed a large portion of the stock, and numerous lots of small inferior lambs were shown. Mr. Thomas Patton, Glenalmond, sold his best lot of blackfaced lambs, to go to Kinross, at £17 per clad score, and seconds at £15. Mr. Duff, Berryhill, sold his blackfaced lambs to the same gentleman at similar rates. The other lots of the blackfaced stock brought about the same rates, and some inferior lots ranged from £5 to £11 per clad score. Prices generally ranged from 4s. to 5s. per head higher than last season.

NEW ROMNEY LAMB AND WOOL FAIR.—There was a brisk demand for lambs, some of which changed hands at the highest prices ever known. The average was about 29s. per head, but a great many fetched 31s., and as high as 36s. per head. There was not much doing in wool, though there were several buyers present. The highest prices offered were £23 per pack for Kent fleeces, and £15 for lamb wool. Flockmasters held for £24 per pack for fleeces, at which price a large quantity was offered.

NORTHAMPTON FAIR.—Scarcely anything selling; no dealers or graziers. Some fat beasts were disposed of, but at very high prices, so extravagant, that they cannot be sold at a profit for less than 9d. or 10d. per lb.

OLD RAYNE FAIR.—Like all the other markets at present, the turn-out of cattle was small. Fat beasts sold at 70s. per cwt. Mr. Brown, Knoekollochy, sold 4 stots at £23 10s.; Mr. Middleton, Clatt, a pair of stots for £40, and a pair of queys for £37 10s.; Mr. George Hay, Netherhall, a pair of prime queys for £54 10s.; Mr. Wilson, Moss-side of Newton, three at £17 10s.; Mr. Edwards, Wellheads, sold 4 yearlings at £11 10s. Mutton fetched 7d. to 8d. per lb. Mr. Grant, Drumbulg, sold wethers at 25s.; Mr. Singer, Williamston, a lot of ewes at 21s.

PENRITH FORTNIGHTLY MARKET.—Beasts were in demand, but the rates remained unchanged. Average prices: Beasts 7s. 6d. to 8s. per stone, sheep 7½d. to 8d., lambs 8½d., and calves 8d. to 8½d. per lb.

SETTLE FAIR was well supplied with sheep and lambs, and the attendance of the trade was numerous. A heavier demand than usual was experienced, but the prices were about the same.

SHAFESBURY FAIR.—About 3,000 sheep were penned, which readily changed hands at high prices. Lambs made 33s. to 50s. the head, ewes 48s. Of stock there was not much shown, but there was a ready sale at high prices.

STROUD FAIR was unusually "slow." Very little stock was shown, but that disposed of realized high prices.

MR. RIGDEN'S SOUTHDOWN SALE.

The annual sale and letting of Mr. Rigden's Southdowns took place at Hove on Friday last. The day was very fine, and there was a large attendance of flockmasters, both from the county and other parts of England. The ewes, principally four-shear, and 100 in number, were sold in lots of five, and averaged £2 18s. The highest-priced lot of ewes were bought by Mr. Harris, of Chichester, at 45 10s., and the second priced lot for Miss Talbot, of Gloucestershire, at 44 15s. Out of the 30 rams which were in the catalogue, seven were sold at an average of £15 5s. 10d., and ten were let at £15 11s. 6d. The six-shear Battersea gold medal sheep, which has now made about 300 gs. in lettings, was let to a "Shrop" flockmaster, Mr. Green, of Great Marlow, who also hired another at 18 gs., and bought four at 11 gs., 11 gs., 15 gs., and 23 gs. Mr. Tomline, M.P., hired three, at 20 gs., 15 gs., and 15 gs.; Mr. Turner, of Chyngton, hired one at 20 gs.; and his Grace the Duke of Richmond another at 16 gs. Messrs. Humphrey, Selby, Symes, Filder, Croskey, Harris, &c., also hired sheep. The great feature of the sale was the demand for tups to cross with "Shrops."

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

"Rain in harvest" has ever been a terror to husbandmen, from the patriarchal age down to the present; and we regret to make an unfavourable record of the character of the past month. The fear in July and in the previous months was drought, and the traces of its effects have still been left in a deficient crop of oats and a light one of hay; but the month just passed away was without seven days' consecutively fine weather. The bean crop, indeed, if well harvested, has been made by the copious fall, and esculents have become luxuriantly fine; but the potato disease has certainly sprung up among the later sorts, and the bulk of the corn crops has sustained much damage as to condition, while the quality of the wheat was very various previously, from the unusual fluctuations of temperature. The samples of new that have hitherto appeared create but sorry forebodings as to the entire yield; but, happily, there are exceptions, and perhaps farmers, anticipating the improved value of everything fine and dry, have kept these back for yet better markets. Nor can we blame those who have the good fortune to possess them, for so doing. We scarcely like any further reference to disasters; but accounts from Poland (once the granary of Europe) are doleful in the extreme, and we hope they are exaggerated, for hail as well as rain have come down heavily on the corn in that country, and almost driven farmers to desperation. In France, too, they are decidedly short this year, as well as in Southern Russia, while the Western States of America have suffered so severely as to give birth to speculation in New York, at advancing rates. But if we go a step further in the catalogue of woes, we must face something still more to be deplored—"that terrible cattle-plague," which has come as the most dismal heritage of free-trade, and fastened upon us with such a grip that the whole island is in consternation, from north to south. As there is, however, one Being who can control the elements, and stay the plague effectually, let us hope that both will cease at His merciful command, and confidence in His goodness ultimately fill the land! We need not, however, say much in referring to what has already happened, in vindication of our opinion that very low prices for corn seem next to impossible. The following rates have lately been quoted at the places named: The best wheat at Paris, which has now become one of the cheapest markets, was quoted at 45s. per qr., red at Antwerp 47s., Zealand wheat at Maestricht 44s., red qualities at Hamburgh 46s. 6d. per qr. The best old highmixed Polish at Dantzic was held at 58s., cost, freight, and insurance included; red at Cologne, 43s. per qr., at Straubing 36s., at Venice 37s. per qr. Floating cargoes of Ghirka from Odessa have been placed in quantity at 43s. per qr., Berdianski 43s. 3d. per qr., Wallachian 37s. per qr., red at Stral-

sund 40s. 6d., Stettin 43s.; spring wheat at Chicago, 28s. 3d. per qr. of 480lbs. New York quotations note the value of Milwaukee Club as about 35s. per 480lbs, amber Western 36s. per 480lbs., winter 48s. 3d. per 480lbs.

The first Monday in Mark Lane opened on small English supplies of wheat, with moderate arrivals of foreign. The show of samples this morning from Kent and Essex was scanty, and with the return of rain the market closed 2s. to 3s. per qr. dearer; but the latter advance was made with difficulty. Foreign also improved 1s. to 2s. per qr., the qualities most in demand being good dry Russian. Cargoes off the coast improved in value fully 1s. per qr. The varied character of the weather through the week similarly affected the several country markets; those held early followed the London rise of 2s. to 3s., then 1s. easier terms were accepted; and as the close brought more rain, there was again some enhancement of values. Wheat at Glasgow was 1s. per boll higher, and the rise at Edinbro' was 1s. to 2s. per qr. Holders of foreign in the Irish markets insisted on higher prices; but not much business was done.

On the second Monday the English supplies were scanty, but the foreign liberal. The morning's show from the near counties was moderate, with a good proportion of new, poor in quality and condition. Old samples were still dearer, say 1s. to 2s. per qr.; but the sale was not brisk; new continues quite neglected, as unserviceable to millers. A fair amount of business was passing in foreign, at a further improvement of 2s. per qr., Russian sorts again being in principal request. The floating trade was also improved to the extent of 1s. to 2s. per qr. The weather being again very catching, and the several country markets affected accordingly, many were 2s. to 3s. per qr. dearer, though little reliance could be placed in the stability of so sudden a rise. Liverpool on Tuesday was excited, but calmed down again on Friday. Glasgow noted an improvement of 1s. 6d. to 2s. per boll, and Edinburgh was 1s. to 2s. per qr. dearer. The advance paid at Dublin on foreign samples was fully 1s. per barrel.

The returns of the third Monday were small, both in English and foreign qualities. The morning's show was also scanty, with but a small proportion of old. These latter sold at the value of the previous Monday; but new were exceedingly difficult to dispose of, from their inferiority and unfitness for milling. The foreign trade remained firm, but no advance could be quoted. With the weather somewhat improved, there was less demand for floating cargoes, which were 1s. per qr. cheaper. Though Wednesday was a pouring day, and very damaging, as some of the days intervening were very hot and fine, a good deal of corn was carried, and there was not the same universal advance,

many places quoting no higher prices; but the majority were 1s. to 2s. per qr. dearer, thus making the country dearer than London, and the markets held on Saturday were generally of this upward tendency. Glasgow made no alteration. Edinburgh was 1s. per qr. dearer. Dublin was only firm, no further advance being practicable.

On the fourth Monday the English supplies were but moderate, though there was plenty of foreign. There was a rather better supply this morning from Essex and Kent, mostly new, the condition of some of which was little above that of grains. The upward movement had then ceased. Even old English samples did not sell freely, though only the former Monday's rates were demanded, and new, from being worse conditioned, were of very doubtful value, though occasionally a fine parcel was offered for sale at about the price of old. The foreign demand was less brisk; but Friday's advance was insisted on for all fine dry Russian sorts, such as Saxonska and Ghirka; but secondary quality Danzig was not dearer, and the demand slackened for floating cargoes as well, with prices below those of Thursday.

The imports into London for the four weeks were, in English qualities, 15,035 qrs.; in foreign, 74,807 qrs., against 15,939 qrs. English, 72,689 qrs. foreign in 1864. The London averages commenced at 46s. per qr. and closed at 48s. 4d. The general average opened at 42s. 10d. and closed at 43s. 1d. per qr. The imports into the kingdom for the four weeks, ending 10th August were, in wheat 1,753,805 cwt.; in flour, 263,852 cwt. There were no exports of wheat or flour from London.

During the past month the flour trade passed from a state of extreme depression and dullness into one of full activity, with a corresponding advance. Business in Norfolks and all country descriptions had previously been at the lowest ebb, the manufacture entailing almost certain loss, but every market-day noting an improvement of 1s. per sack. Norfolks have become fully worth 33s., some holding for more; while barrels, notwithstanding their relative dearness, have gained 2s. per barrel. Town millers raised their top price on the 14th to 43s., at which it has since stood. The stock of barrels in London is very reduced, and the rise at New York is not favourable to large imports. The imports into London in four weeks were 53,905 sacks English, 2,174 sacks 19,105 barrels foreign, against 49,906 sacks English 1,406 sacks 56,332 barrels foreign in 1864.

The barley trade during the month has been on a small scale, the season not having yet commenced, and the arrivals of new malting being hitherto extremely scanty; but prices have gradually hardened for all kinds, in consequence of the smallness of stocks and the roughness of the weather, foreign Baltic having improved in value 1s. to 1s. 6d. and low grinding about 2s. per qr., Danube being worth 22s. to 23s. per qr. As much barley has been out in the rain, fine bright quality for malting is likely to be very scarce, and full prices paid for it; but there must of necessity be much that will prove discoloured and coarse, which may weigh upon the markets. Not much dependence can be placed on foreign this season to

supply any deficiencies of our own, as Northern Europe, like ourselves, has had much wet. The imports into London for the four weeks were 855 qrs. English, 12,168 qrs. foreign, against 1,110 qrs. English, 11,850 qrs. foreign in 1864. With the weather so much against the barley crop, malt has been steadily advancing in value, till fine qualities have become worth 66s. per qr.

The past month, like its predecessor, has been extraordinary for its imports of foreign oats; but with the weather damaging to the small crop on the ground, the market has borne the unusual pressure well, not having given way more than 1s. per qr., a decline of 6d. per qr. taking place on the second and fourth markets. Fine 40lb. Danish and Swedes are now worth about 22s. 6d. per qr., and Russians in proportion; so, if there be any falling off in the foreign supplies, we expect this last 1s. will be recovered: but as yet there is no sign of it. The imports into London for the four weeks were—in English sorts 1,594 qrs., Scotch 1,952 qrs., Irish 455 qrs., and foreign 271,643 qrs. (half of which arrived on the fourth Monday), against 2,954 qrs. English, 40,094 qrs. Scotch, 14,127 qrs. Irish, and 229,495 qrs. foreign for the same period in 1864.

Beans have been very steady through the month, being all along high priced; but on the fourth Monday they advanced fully 1s. per qr., some of the new crop being cut, and reported to be damaged by the wet weather. This grain, however, is too high for speculation, and as they have a crop of Maize in America this year, and shipments have been coming forward for Ireland, we may see some decline if the bulk of the crop escapes damage, or should only be damp. Egyptian have lately been selling freely at 38s., and Mazagans at 40s.. The imports into London for four weeks were—1,937 qrs. English and 5,691 qrs. foreign, against 2,358 qrs. English and 1,451 qrs. foreign, in 1864.

Though the trade in peas has been small, prices have been gradually hardening, old foreign having followed the value of beans, and new coming as yet in too small quantities to lower prices. Fine new boilers are worth about 42s., but extra foreign are held for more—grey at 36s. to 37s., and the other sorts in proportion. The imports into London for the four weeks were 910 qrs., exclusively English, against 1,896 qrs. English and 4,204 qrs. foreign for the same period in 1864. With a rise in wheat and flour, and probable advance in meat, it seems likely that fine boilers may improve in value as Christmas approaches.

With good arrivals of linseed at the commencement of the month from India, and some dullness as the consequence, prices eventually hardened again, both for seed and cake, and the price which well-fed cattle now readily make prevents much probability that rates will decline, more especially as the crops abroad have been reported as deficient.

The seed trade has been in a state of abeyance in consequence of the doubtfulness of the weather. The high prices at which the small stock of cloverseed left off at the close of the season, has prevented any speculative inquiry; but holders with

present prospects have been little disposed to sell. Trefoil, too, has improved in value. Old mustard-seed has found some speculative inquiry, the new being endangered. Canary seed has also risen from its long neglect, and become worth 2s. per qr. more; but new winter tares, offered in greater plenty, have fallen in value to 7s. 6d. per bushel.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

	Shillings per Quarter.
WHEAT, Essex and Kent, white	new 3s to 50 ... 44 to 53
	red " " 38 44 ... 44 47
Norfolk, Lincoln, and Yorkshire, red	" " " " 44 47
BARLEY	27 to 30.....Chevalier, new 30 37
Grinding	26 29.....Distilling 28 32
MALT, Essex, Norfolk, and Suffolk	58 66
Kingston, Ware, and town-made	58 66
Brown	50 54
RYE	26 28
OATS, English, feed 19 to 23	Potato..... 22 27
Scotch, feed 18 23	Potato..... 22 27
Irish, feed, white 17 20	Fine..... 21 24
Ditto, black 17 20	Potato..... 21 24
BEANS, Mazagan 36 39	Ticks..... 36 39
Harrow 39 41	Pigeon..... 41 46
PEAS, white, boilers 37 41	Maple 37 to 40 Grey, new 35 37
FLOUR, per sack of 280lbs., Town, Households	38 43
Country, on shore 31 to 34	" " 35 36
Norfolk and Suffolk	31 33

FOREIGN GRAIN.

	Shillings per Quarter.
WHEAT, Dantzic, mixed	47 to 51.....old, extra 51 to 57
Königsberg	45 49.....extra..... 49 51
Rostock	45 49.....fine..... 50 51
Silesian, red	43 45.....white..... 46 48
Pomera., Meckberg., and Uckermark.....	red old..... 43 49
Russian, hard, 38 to 39	St. Petersburg and Riga 42 44
Danish and Holstein, red	41 43
French, none	Rhine and Belgium..... 41 49
American, red winter 44 to 47, spring 43 to 46, white	47 50
BARLEY, grinding 22 to 25	distilling and malting 27 32
OATS, Dutch, brewing and Polands 18 to 23	feed 17 21
Danish and Swedish, feed 19 to 22	Stralsund..... 19 23
Russian, Riga 19 to 22	Arch. 18 to 21.....P'sburg 20 24
BEANS, Friesland and Holstein	35 38
Königsberg	35 to 39.....Egyptian..... 37 38
PEAS, feeding and maplo 36 39	fine boilers..... 39 41
INDIAN CORN, white 30 35	yellow..... 30 34
TARES	Lentils..... — —
FLOUR, per sack, French 32 35	Spanish, p. sack 32 35
American, per brl. 22 24	extra and d'ble 25 27

PRICES OF SEEDS.

LONDON, MONDAY, August 28. — Cloverseed is without business passing and unaltered in value. Trefoils are steady in value. Winter Tares, with improved supply and small demand, were noted 6d. per bushel lower. New Rapeseed, with small supply, is fully as dear.

BRITISH SEEDS.

MUSTARD, per bush., white	9s. 6d. to 10s.
CANARY, per qr.	52s. —s.
TARES, winter, new, per bushel	7s. 3d. 7s. 9d.
CLOVESEED, red	—s. —s.
CORIANDER, per cwt.	—s. —s.
TREFOIL	27s. 28s.
LINSEED, per qr., sowing 56s. to 60s., crushing	54s. 58s.
RAPESEED, per qr.	72s. 76s.
LINSEED CAKES, per ton	£9 10s. to £10 10s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS.

CORIANDER, per cwt.	20s. to 22s.
CARAWAY	—s. 33s.
TREFOIL	25s. 26s.
HEMPSEED, small —s. per qr., Dutch	—s. 48s.
LINSEED, per qr., Baltic 55s. to 60s. Bombay	68s. —s.
LINSEED CAKES, per ton	£9 10s. to £11 0s.
RAPE CAKE, per ton	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Aug. 28.—Our market has been supplied with about 1,500 pockets of the new growth, which, considering the early period of the season, have met with a good demand, prices ruling for Sussex from 120s. to 140s. and for Kents 115s. to 180s.

The demand for yearlings continues good, and the recent advance in value is fully maintained.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Aug. 28.—The arrivals of home-grown Potatoes are tolerably large. For most qualities the trade is dull, and prices have a downward tendency. There was no import into London last week.

Regents	60s. to 90s. per ton.
Shaws	50s. to 70s. „

COUNTRY POTATO MARKETS.—DONCASTER, (Saturday last).—A good supply of new potatoes, which met a good demand at the following rates: Wholesale prices from 8s. to 9s. per load, and retail 1d. per lb. MANCHESTER, (Saturday last).—Potatoes 5s. to 10s. per 252lbs. YORK, (Saturday last).—The supplies, though fair, do not come to hand very liberally, but, owing to there being no complaints of the quantity likely to be produced in England, and the accounts of the Scotch potato crops being favourable, the prices rather receded: we may quote them at from 7s. 6d. per tub of 280lbs., and from 6d. to 8d. per peck retail.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, August 28.—Trade with us is in a most sluggish state, with drooping prices; indeed, quotations are quite nominal.

Dorset, fine	120s. to 122s. per cwt.
Devon	112s. to 114s. per cwt.
Fresh	11s. to 14s. per dozen.

GLASGOW, (Wednesday last).—The arrivals of cheese, both by steamer and rail, continue large, and are quickly bought up, at sellers' prices. About 31 tons passed the weighing scales. Some prime lots of Cheddars brought 2s. to 3s. above our highest quotations. Old Dunlop 60s. to 66s., new ditto 56s. to 60s., old Cheddar-made 64s. to 67s., new ditto 58s. to 62s., skim-milk 24s. to 26s. per cwt.

CORK BUTTER MARKET, (Friday last).—Prices of Butter per cwt.:—Heavy-salted: First quality 117s. to 114s., second ditto 114s. to 111s., third ditto 107s. to 104s., fourth ditto 106s. to 103s., fifth ditto 94s. to 91s., sixth ditto 74s. to 71s. Mild-cured: First quality 121s. to 118s., second ditto 118s. to 115s., third ditto 116s. to 113s. Currency: Heavy-salted, 10s. per cwt. less; mild-cured, 10s. ditto; sponged butter, 2s. ditto.

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, Aug. 28.—For nearly all kinds of English wool the demand continues very inactive, both for home use and export. In prices, however, very little change has taken place. The supply on offer is very moderate; and we understand that the stocks held by the leading manufacturers are limited.

CURRENT PRICES OF ENGLISH WOOL.	s.	d.	s. d.
FLEECES—Southdown hoggets.....per lb.	1	8	to 1 9
Half-bred ditto	1	11½	2 0½
Kent fleeces.....	1	10½	1 11
Southdown ewes and wethers	1	8½	1 9
Leicester ditto	1	10½	2 0
SORTS—Clothing.....	1	6	1 11
Combing.....	1	5	2 0½

BRESLAU WOOL REPORT, Aug. 21.—We had again a pretty brisk demand for most descriptions of middle-fine combing and clothing wools, with transactions amounting to about 3,000 cwt. Prices have been generally well maintained, and in most instances were in favour of the sellers. Only fine and superline qualities are continuing comparatively neglected, with the exception of lambs', which are much required and very scarce. The bulk of the above-mentioned quantity, consisting of Hungarian, Volhynian, and Polish fleeces, has been acquired by home and Saxon manufacturers and combers at from 66 to 75 thalers, whereas shipes, skin-wool, in bundles, refuse, and Charkow scoured wools have been purchased at late quotations by Netherland, Hamburg, and French commissionners. In general, business might well be livelier at this season of the year; but there is no reason to despair of a soon return of greater activity, as provisions are by no means very large, at prices increasing at most staple places.—GUNSBERG BROTHERS.

THE FARMER'S MAGAZINE.

S E P T E M B E R , 1 8 6 5 .

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CAUTION.—CHLORODYNE.

In Chancery,

Vice Chancellor Sir W. P. WOOD stated that Dr. J. COLLIS BROWNE was, undoubtedly, the Inventor of Chlorodyne: that the statements of the Defendant, FREEMAN, were deliberately untrue, and he regretted to say they had been sworn to. Eminent Hospital Physicians of London stated that Dr. J. COLLIS BROWNE was the discoverer of Chlorodyne; that they prescribe it largely, and mean no other than Dr. BROWNE'S.—See *Times*, July 13th, 1864. The Public, therefore, are cautioned against using any other than Dr. J. COLLIS BROWNE'S CHLORODYNE.

THE Original and Only Recipe for the Manufacture of Chlorodyne was confided by Dr. Browne, late Army Medical Staff, DISCOVERER and INVENTOR,

Solely to J. T. DAVENPORT, consequently there can be NO OTHER GENUINE preparation.

This INVALUABLE REMEDY produces quiet refreshing sleep—relieves pain, calms the system, restores the deranged functions, and stimulates healthy action of the body—without creating any of those unpleasant results attending the use of opium. Old and young may take it at all hours and times when requisite. Thousands of persons testify to its marvellous good effects and wonderful cures, while medical men extol its virtues most extensively, using it in great quantities in the following diseases:—

CONSUMPTION, ASTHMA, BRONCHITIS, HOOPING COUGH, NEURALGIA, DIARRHŒA, RHEUMATISM, SPASMS, &c.

EXTRACTS FROM MEDICAL OPINIONS.

* * * *Earl Russell communicated to the College of Physicians that he had received a Despatch from her Majesty's Consul at Manilla, to the effect that Cholera had been raging fearfully, and that the only remedy of any service was Chlorodyne.*—See *LANCET*, December 31st, 1864.

Extract of a Despatch from Her Majesty's Consul at Manilla, transmitted to J. T. Davenport by Earl Russell:

"The remedy most efficacious in its effects (in Epidemic Cholera) has been found to be CHLORODYNE, and with a small quantity given to me by Dr. Burke I have saved several lives."

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Head Office—21, Lombard-street.

At the Half-yearly Meeting of the Proprietors, held on Thursday, the 3rd of August, 1865, at the London Tavern, Bishopsgate-street, the following Report for the half-year ending the 30th June, 1865, was read by the Secretary. W. Champion Jones, Esq., in the chair:—

REPORT.

The Directors have the pleasure to submit to the proprietors the balance-sheet of the Bank for the half-year ending 30th June last.

They have also to report that, after payment of all charges, interest to customers, and making ample provision for bad and doubtful debts, the net profits amount to £106,821 5s. 1d., which, added to £18,629 12s. 3d., brought forward from the last account, makes a total of £125,450 15s. 4d. for appropriation.

The Directors have accordingly declared the usual dividend of 6 per cent., with a bonus of 9 per cent., making together 15 per cent., for the half-year, which will amount to £111,790 8s. 4d., and leave £13,660 7s. to be carried forward to profit and loss new account.

They regret to announce the decease of their esteemed colleague Edward Huggins, Esq., and have to report that Edward John Hutchins, Esq., has been elected a Director in his stead.

The dividend and bonus (together £3 per share), free of income tax, will be payable at the Head Office, or at any of the Branches, on and after Monday, the 14th instant.

BALANCE-SHEET OF THE LONDON AND COUNTY BANKING COMPANY, 30th JUNE, 1865.

DR.			
To capital paid up.....	£750,000	0	0
To instalments unpaid	105	0	0
			£749,895 0 0
To reserve fund	£250,000	0	0
To instalments unpaid.....	105	0	0
			249,895 0 0
Amount due by the bank for customers' balances, &c.	£10,904,272	4	11
To liabilities on acceptances	2,998,434	0	4
			13,902,706 5 3
To profit and loss balance brought from last account	£18,629	12	3
To gross profit for the half-year, after making provision for bad and doubtful debts	284,860	2	4
			303,489 14 7
			£15,205,985 19 10
CR.			
By cash on hand at head office and branches	£1,531,962	13	4
By cash placed at call and at notice	1,098,924	9	0
			£2,680,887 2 4

Investments, viz. :—			
By government and guaranteed stocks	£1,005,714	13	3
Other stocks and securities	113,495	15	0
			1,119,210 8 8
By discounted bills, and advance to customers in town and country	11,163,912	15	10
By freehold premises, in Lombard-street and Nicholas-lane, freehold and leasehold property at the branches, with fixtures and fittings	132,305	1	11
By interest paid to customers	71,213	11	0
By salaries and all other expenses at head office and branches, including income tax on profits and salaries	85,457	0	1
			£15,205,985 19 10
DR. PROFIT AND LOSS ACCOUNT.			
To interest paid to customers	£74,213	11	0
To expenses as above	85,457	0	1
To rebate on bills not due, carried to new account	18,368	8	2
To dividend of 6 per cent. for the half-year ...	44,716	3	4
To bonus of 9 per cent.	67,074	5	0
To balance carried forward	13,660	7	0
			£303,489 14 7
CR.			
By balance brought forward from last account	£18,629	12	3
By gross profit for the half-year, after making provision for bad and doubtful debts	284,860	2	4
			£303,489 14 7

We, the undersigned, have examined the foregoing balance-sheet, and have found the same to be correct.

(Signed) WILLIAM NORMAN,
 R. H. SWAINE,
 JOHN WRIGHT, } Auditors.

London and County Bank, 27th July, 1865.

The foregoing Report having been read by the Secretary, the following resolutions were proposed and unanimously adopted:—

1. That the Report be received and adopted, and printed for the use of the Shareholders.
2. That the thanks of this Meeting be given to the Board of Directors for the able manner in which they have conducted the affairs of the Company, and that a sum of £2000 be added to their annual remuneration, to take effect from the 1st of January last.
3. That the thanks of this Meeting be presented to William M'Kewan, Esq., and to the Principal and other Officers of the Bank, for the zeal and ability with which they have discharged their respective duties.
 (Signed) W. CHAMPION JONES, Chairman.
 The Chairman having quitted the chair, it was resolved and carried unanimously,
4. That the cordial thanks of this Meeting be presented to W. Champion Jones, Esq., for his able and courteous conduct in the chair.
 (Signed) P. P. BLYTH, Deputy Chairman.
 Extracted from the Minutes.
 (Signed) F. CLAPPISON, Secretary.

LONDON AND COUNTY BANKING

COMPANY.—NOTICE IS HEREBY GIVEN, that a DIVIDEND on the Capital Stock of the Company, at the rate of 6 per cent. for the Half-year ending the 30th June, 1865, with a BONUS of 9 per cent., WILL BE PAID to the Proprietors, either at the Head Office, 21, Lombard-street, or at any of the Company's Branch Banks, on and after Monday the 14th inst.

By order of the Board,
 W. M'KEWAN, General Manager.

21, Lombard-street, August 4th, 1865.

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Prepared only by Thomas Bigg, Chemist, &c., at his Manufactory as above, and sold as follows, although any other quantity may be had, if required:—

4 lb. for	20 sheep, price, jar included	.....	£0 2 0
6 lb.	30 " " " "	.....	0 3 0
8 lb.	40 " " " "	.....	0 4 0
10 lb.	50 " " " "	.....	0 5 0
20 lb.	100 " " " (cask and measure	.....	0 10 0
30 lb.	150 " " " included)	.....	0 15 0
40 lb.	200 " " " "	.....	1 0 0
50 lb.	250 " " " "	.....	1 3 6
60 lb.	300 " " " "	.....	1 7 6
80 lb.	400 " " " "	.....	1 17 6
100 lb.	500 " " " "	.....	2 5 0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

MOST IMPORTANT CERTIFICATE.

From Mr. HERAPATH, the celebrated Analytical Chemist:—
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Sir,—I have submitted your Sheep-Dipping Composition to analysis, and find that the ingredients are well blended, and the mixture neutral. If it is used according to the directions given, I feel satisfied, that while it effectually destroys vermin, it will not injure the hair roots (or "yolk") in the skin, the fleece, or the carcase. I think it deserves the numerous testimonials published. I am, Sir, yours respectfully,

WILLIAM HERAPATH, Sen., F.C.S., &c., &c.,
Professor of Chemistry.

To Mr. Thomas Bigg,
Leicester House, Great Dover-street, Borough, London,

He would also especially call attention to his SPECIFIC, or LOTION, for the SCAB, or SHAB, which will be found a certain remedy for eradicating that loathsome and ruinous disorder in Sheep, and which may be safely used in all climates, and at all seasons of the year, and to all descriptions of sheep, even ewes in lamb. Price FIVE SHILLINGS per gallon—sufficient on an average for thirty Sheep (according to the virulence of the disease); also in wine quart bottles, 1s. 3d. each.

IMPORTANT TESTIMONIAL.

"Scoulton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your invaluable 'Specific for the cure of Scab in Sheep.' The 600 sheep were all dressed in August last with 84 gallons of the 'Non-Poisonous Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continued getting worse. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your Specific proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use. I remain, dear Sir, your obedient servant,
"To Mr. Thomas Bigg," "For JOHN TINGEY, Esq.,
"R. RENNEY.

Flockmasters would do well to beware of such preparations as "Non-poisonous Compositions" it is only necessary to appeal to their good common sense and judgment to be thoroughly convinced, that no "Non-poisonous" article can poison or destroy insect vermin, particularly such as the Tick, Lice, and Scab Parasites—creatures so tenacious of life. Such advertised preparations must be wholly useless, or they are not what they are represented to be.

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No. 1, Vol. XXVIII.

OCTOBER, 1865.

[THIRD SERIES.]

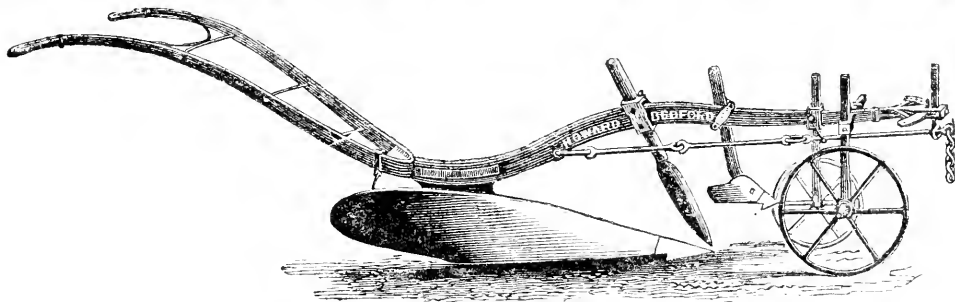
THE
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MONTHLY JOURNAL
OF
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OCTOBER, 1865.

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“Dr. Curtis has conferred a great boon by publishing this little work, in which is described the source of those diseases which produce decline in youth, or more frequently, premature old age.”—*Daily Telegraph*, March 27, 1856.

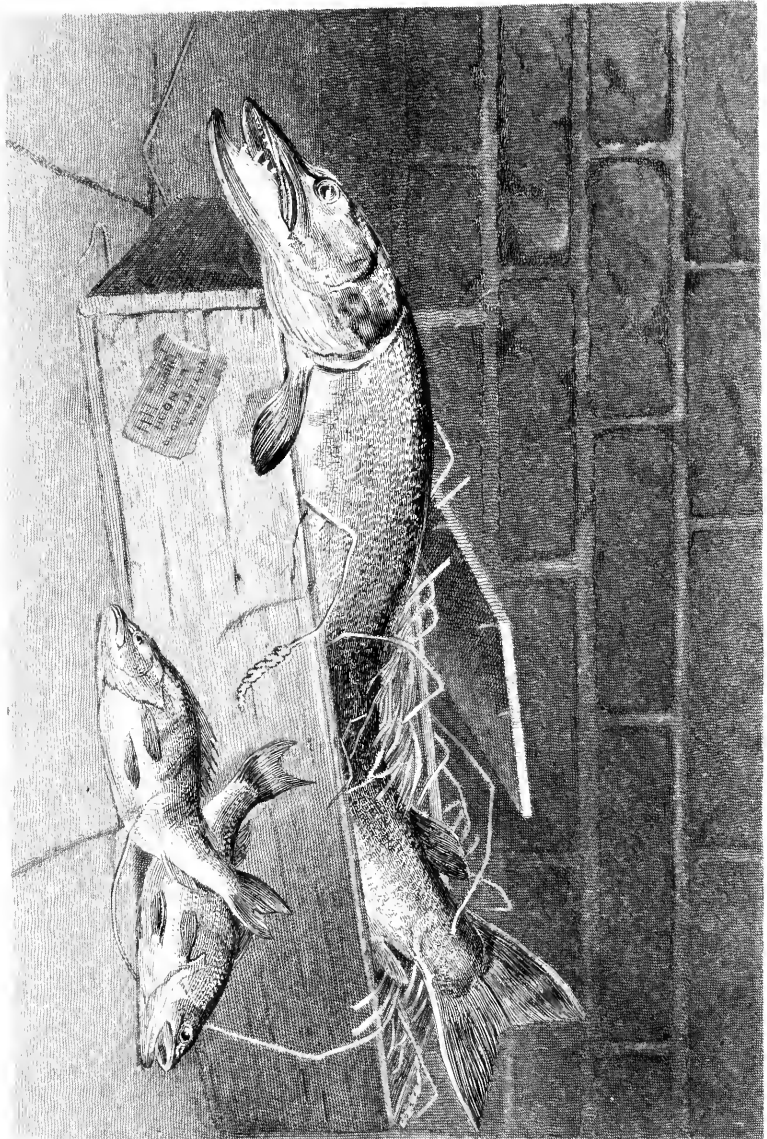
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THE FARMER'S MAGAZINE,

OCTOBER, 1865.

PLATE I.

SPANGLE 2ND; A ROYAL PRIZE HEREFORD COW.

Spangle 2nd, bred by the late Mr. Rea, of Monaughty, and calved on September 16, 1859, is by Wellington (1112) out of Spangle, by Chieftain (930), her dam Young Venus by Cholstrey (217)—Venus by Albert (330)—Countess by Old Court (306).

Wellington, red with a white face, bred by Mr. P. Turner, of The Leen, and calved September 23rd, 1851, was by Duke, a son of Northampton (600), out of Miss Forester, by Forester (398).

At the Worcester meeting of the Royal Agricultural Society in 1863, Spangle 2nd, in company with Diana 2nd, took the first prize of £15 for the best pair of Hereford heifers in milk or in calf. These were exhibited by the executors of Mr. Rea, of Monaughty; and at the dispersion of the herd which followed in the autumn, Spangle was sold to Mr. Baldwin, who, however, gave up his purchase to Mr. Rea, of Westonbury. This gentleman's premature death occurred soon afterwards; and at the Newcastle-upon-Tyne Royal meeting, in 1864,

Spangle 2nd, entered in the name of Mrs. Rea, took the first prize of £20 as the best Hereford cow, Kate the 2nd, from the same herd, taking the second place.

We thus spoke of Spangle, on first seeing her at Worcester: "The local prizes brought out but a short lot, chiefly noticeable for a pair of rare massive heifers shown by the executors of the late Mr. Rea, of Monaughty." And again at Newcastle: "A certain zest was given to the exhibition of Herefords by the entry of Mrs. Rea's two cows, a couple of grand animals, with size, breed, and quality, all in proof of their right place." At the Westonbury sale, in the October following, Mr. Baldwin, of Luddington, again became the purchaser of Spangle, at 101 gs., but she was unfortunately not in calf, and is now in the stalls preparing for the Christmas shows. They have still strong hopes, however, that she may breed, so that this grand cow may possibly again return to the herd after her visits to the Birmingham and Islington Halls.

PLATE II.

A JACK IN THE BOX.

From Waterford to London traces the birthright of our fish; and the O'Gorman thus writes of the Irish pike:—

"The small trout, the roach, the salmon-fry, a small herring, the tail of an eel spangled and tinselled, are excellent; so is a small jack, and sometimes a good-sized one; so is a goldfinch, a swallow, or yellow-hammer. My method of putting up a fry, or small trout, or roach, is to have a hook come out in the middle of its side, with a curve in the tail to spin. The head (when I was intent on real destruction) I fastened with another hook let slip down on the wire, or gimp, with a small loop well armed, and the latter hook came out through the back part of the head. I have often taken more pike, and even trout, with the upper hook than the lower; for fish of prey generally make at the head.

David Burke's method of catching pike was curious. He fished with a double hook, without a swivel, put his chain through the fish's mouth, and drew it out of the navel, tied the chain about the tail, and left the double hook projecting through the mouth of the trout, or fry, or frog. In this way the bait was dragged tail foremost; but he did not care, and laughed at any other method, and he always killed a great number of pike, and sometimes an odd salmon or so. He left the bait a very short time to any fish, and generally had him well booked. This should seem an unnatural method, but it is a sure one.

"They are very whimsical fish, and the kind of bait must be frequently changed. I have often shot a pretty small bird for a bait, and killed large pike with it, when they would not look at trout

or roach. A good-sized pike-fly is often very good. The largest pike I ever killed was thirty-two pounds weight; he had a trout of four pounds entire in his maw, which he must have taken only just before he had made at a small roach which I had on a single brass wire; and it must have been from sheer wantonness, or sport, that he seized it; he was only three feet four inches in length, but as thick as a salmon."

Of the perch, the same pleasant authority speaks with as vigorous decision and indisputable experience: "They are a most bold, daring, and destructive fish, eat small fry of all kinds voraciously, root up the spawn beds, will even scare trout from the feeding places near the shore, like noise, and are fond of music, which attracts them to the surface. One of my sons (now I hope happy) assured me that he saw a vast shoal of them appear over water, attracted by the sound of the bagpipes, when a Scotch regiment were marching over a neighbouring bridge, and that they remained there until the sound died away in the distance. How much

superior the ear of the perch to that of Paganini! who, on hearing the Scotch pipe, prostrated himself on the floor, declaring that it must have been invented by the devil.

"Perch like their bait moving, and will take small fry, roaches, small trout, loaches, little frogs, and small eels, and will often rise at salmon flies and large lake flies; they will also take the large blue-head worm, and the leg of a frog put on a middle-sized hook; they are a most excellent fish—almost so good as to make amends for the mischief they do. And now for dressing them: Split for about three inches along the great fin, and as much in the belly; do not scrape, scale, or gut (it is a clean-gutted fish), broil well on a gridiron; when sufficiently done (which you will know by the skin rising well), take up; split the remainder of the belly, and the back; raise off the skin, which will come away easily; take off the head (to which the gut will attach, and come away clean); you then have a nice fish: eat it with cold butter, and, if you do not like it, you must be hard to please."

OUR SUPPLY OF WATER.

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

The purity of the water consumed by our live stock and by ourselves can hardly be too carefully regarded. That the water we use materially influences our health is a well-known fact. Cholera, typhoid, and other diseases, indeed, ever select for their earliest attacks the consumers of impure water, the dwellers around stagnant collections of liquid impurities. Our domestic animals suffer materially in this way—the horse is peculiarly sensitive and discriminating in the selection of his water: he avoids that containing animal matters; refuses even to drink from a pail that has held soap; the appearance of his coat is affected by using hard water. The groom, who is well aware of these facts, takes care to give his horses soft water. The trainer of race-horses sometimes carries the water with him to which they have been accustomed.

Thus regardful of the water for our horses, it would be reasonable to expect the same care in our own cases. But how very different is the ordinary mode of supplying ourselves! Think of the cesspools into which we drain our houses, in close proximity to, and their contents soaking into, our wells. Examine the waters with which many of our towns are supplied, and ask ourselves if these are such as we ought to consume?

It is, indeed, far too little known how widely varying is the composition of different spring, river, and well waters. It will not therefore be a profitless research if we inquire on this occasion into these matters.

We need hardly remind ourselves that the primary source of all waters is the rainfall. The rain descends upon the earth, not, as was once supposed, entirely pure, but nearly so; it is the purest of all the waters of which we have to inquire, it merely containing a minute proportion of ammonia, nitric acid, and other foreign substances. It is when that rainwater descends upon the earth, that, percolating our soils, it dissolves various soluble substances, and has its purity diminished.

In a very able work on "The supply of water to towns," well worthy of my readers' perusal, Mr. Baldwin Latham, the engineer to the Croydon Board of Health, has well traced the origin and course of rain-water. As he

observes, "Rain is the result of the condensation of aqueous vapour, which is, at all temperatures, more or less present in the atmosphere. The quantity of aqueous vapour capable of being suspended in the atmosphere increases in a greater ratio than the temperature; and the phenomenon of rain occurs when the air, saturated with moisture, loses its temperature, and precipitates the excess it is no longer capable of containing, either in the form of dew, rain, hail, or snow. It is found that the first causes of rain are identical with those that produce the winds and currents in the atmosphere, viz., the changes of temperature, to some extent the electrical state of the atmosphere, and the magnetic state of the earth; consequently it very naturally follows that the winds have a very close connexion with the rainfall. Thus, winds blowing from a warm climate over a great expanse of sea would be completely saturated with vapour, which, upon coming into a cooler climate, would be precipitated; on the other hand, a wind blowing from the frozen regions of the Arctic ocean, and deriving its moisture from the ice and snow of those severe regions, would, when it arrived in a warmer climate, by lowering the temperature of the atmosphere of that climate, diminish its power to retain aqueous vapours; and if, at the time, it was surcharged with moisture, a fall of rain must ensue. The physical conditions of every locality have some effect upon the rainfall. Thus, from observation, it has been ascertained that the rainfall is greater in mountainous districts than in level countries, which is probably owing to currents of air saturated with vapour striking against the mountain-sides, and losing temperature by contact or by reason of being compelled to ascend into higher and colder regions; there is, however, a limit to the effects produced by elevation, for there are regions too high to experience any heavy rainfall, for the rains of Switzerland and the Alpine regions are not greater than those in the north of this country. The amount of rainfall is considerably influenced by the position of the locality with respect to the currents in the atmosphere: for example, it is found that the prevailing winds in this country are

westerly, and come to us from a warmer climate: after sweeping over the face of the great Atlantic ocean they are naturally saturated with moisture, and, striking the ridges and high lands on our westerly coast, discharge the greater portion of their burden there. Thus we find it is nothing uncommon in the counties of Cumberland, Westmoreland, and Lancashire, to have an annual depth of rainfall equal to 6 feet; while in Cambridgeshire on the eastern side of the country, the annual rainfall seldom exceeds 22 inches. The rainfall also varies with the seasons of the year, the rainfall of this country being greater in winter than in summer, because the temperature of the atmosphere is decreasing in winter, and with it its capacity for retaining vapour, while in summer the opposite is the result. But it will also be found, as a rule, that heavier rains fall in summer than in winter, although there may be fewer showers; because in summer the atmosphere has greater powers for retaining moisture, so that when the causes that induce a fall of rain are brought into action, there is a larger amount of moisture to be precipitated. In Germany the rainfalls of winter and summer are about equal; at St. Petersburg the rainfall of winter is but little more than one-third the rainfall of summer; while in Siberia the rainfall in winter is but one-fourth that of summer."

In our island the average amount of the rain annually falling, varies from about 20 inches in Essex and in Bedfordshire to about 50 or 60 inches at Keswick and Kendal, or to more than 100 inches on some of the Westmoreland and Cumberland hills.

The next question is the varying extent to which the rain water is absorbed by our soils. Upon this branch of our inquiry Mr. Latham well remarks that "the amount of rain capable of being absorbed by the surface upon which it falls depends, in a great measure, upon the temperature, the geological formation and physical outline of the district. Under such varying conditions, the amount of water absorbed, and capable afterwards of being used, when issuing from springs, or by sinking wells, is extremely capricious. The greater the quantity of water evaporated or retained by vegetation, the less will remain to be absorbed. Rain descending upon a dry and parched surface in the heat of summer, or during the occurrence of drying winds, will be nearly all evaporated, so that the rate and amount of absorption depend materially upon the absorbent properties of the soil. Thus in the sands of the red sandstone formation the rainfall is absorbed as fast as it touches the surface, and the same may be said of the rain falling in many places on the chalk formation, while upon the clay soils or impervious formation the greatest part of the rain would generally be directly conveyed away by surface streams. The contour of a country, in a measure, affects the rate of absorption, as the rainfall on mountains or hilly districts has a greater tendency to gravitate rapidly to the rivers, while on table-lands the water lingers, and consequently such lands are favourable to absorption.

"Experiments made by Dr. Dalton, extending over three years on the new red sandstone formation, show that 25 per cent. of the whole rainfall percolated to a depth of 3 feet. Experiments made at Ferrybridge, in Yorkshire, by Mr. Charnock, on the magnesian limestone formation, resulted in giving but 19.6 per cent. of rain percolating to a depth of 3 feet, and a like experiment made by Messrs. Dickenson and Evans, on the sandy gravelly loam which covers the chalk about Watford, gave as much as 30 per cent. of the rainfall percolating to a depth of 3 feet. In the latter experiment the average rainfall was found to be 26.33 in. per annum, and the average mean filtration 7.92 per annum. Of this quantity 7.34 in. were absorbed between October and March inclusive, which was at the rate of 55½ per cent. on the rainfall of that period, whilst

between April and September inclusive, only .58 in. of rainfall was absorbed, which was at the rate of 4½ per cent. of the rainfall of that period. From this experiment it appears that the largest amount of rainfall is absorbed during the months of November, December, and January, when practically all may be said to be absorbed, and that the least amount at any time absorbed was in the month of August, when practically it was nothing. It has been calculated by Mr. Beardmore, that of the rainfall absorbed in winter 60.7 per cent. is carried off directly at the time of the rainfall, leaving 39.3 per cent. to supply rivers and wells; and of this probably only 3½ per cent. of the rainfall absorbed really goes to furnish a supply for wells, which in a measure will account for the failing of many ordinary wells in certain seasons of the year. This process of absorption plays a very important part in the economy of nature, as by it the rainfall is stored for the purposes of utilization by both the vegetable and animal kingdoms. Were it not for this, our rivers would only flow in times of rainfall, and at such times their impetuosity and floods would be so great as to prove a great drawback to their subservance for the purposes of man, and at other times their channels would be dry, which would probably be a greater disadvantage, as all vegetation would suffer materially, if it could survive the droughts we should experience; as it is, the water falling on the surface penetrates it to various depths, forming for itself subterraneous reservoirs, and it is from these reservoirs the water is emitted which keeps our rivers flowing and supplies water for vegetation, even in the time of the greatest drought."

The different modes of obtaining a supply of the water which thus flows from the heavens is the next portion of this important inquiry. Here let us again refer to Mr. Latham's excellent work. He observes, p. 13, that "these are five in number, viz., 1. By the interception of the rain-water before it has reached the ground, as from roofs, &c. 2. By collections on the impervious surface of the ground before it has run off. 3. From streams. 4. From natural springs. 5. From wells." As to the first means of supply, he continues:

"One of the simplest modes of securing a supply of water is by collecting and storing the rainfall that falls direct upon the roofs of our houses, or upon the paved surfaces of yards, &c. This mode is no doubt very ancient, and was probably one of the first expedients adopted for securing a supply wherever man had advanced to such a state of civilisation as to require a house with an impervious covering for his shelter. The amount of surface available and suitable for receiving the rainfall is generally limited, so that the quantity of water capable of being stored is also limited; yet there are many places that depend upon this mode of procuring their principal supplies of water. A large portion of the supply of water for Jerusalem, Constantinople, and other ancient places, was procured by storing the rain-water in underground cisterns, some of which are in use to the present day. The city of Venice is an example of one of many places supplied principally by rain-water; but it is found that, in long dry seasons, the inhabitants of such places as are dependent on this mode of procuring a supply of water are often put to great straits for a supply; and if we assume that 60 feet of roof or impervious surface is available for each individual of the population, with an annual rainfall of 30 in. if all of it were collected and stored, it would only give two-and-a-half gallons per day as the quantity for each individual. Professor Leslie made a calculation with respect to a lofty house in Paris containing twenty-five persons, and he found that each person might procure a supply of a little over one gallon per day. When these quantities are compared with the twenty to fifty gallons per head per day at present used

by populations having a constant supply of water, it is easy to see the disadvantages of depending entirely upon the rainfall collected on roofs and other surfaces connected with our dwellings as the sole mode of supply."

Then as to the collection of water from gathering grounds, such as that which is carried off by the surface and other land-drains of our fields. This is a question peculiarly interesting to the readers of this magazine, since the collection and use of this water, as in irrigation for instance, is far from being generally understood. The amount capable of being collected in this way from a given surface of course varies with the nature of the soil and the amount of rain which it receives. "If," says Mr. Latham, "the surface of the drainage area is porous, resting on impervious strata, a much larger quantity can be obtained by under-drainage than if the water was taken from the surface only. The quantity of water capable of being taken by under-drainage, if the strata is uniform, will depend upon the depth of the drains. An experiment made by Mr. Milne, of Milne Garden, in Berwickshire, extending from June, 1845, to April, 1849, shows that under-drains, 3 feet deep, laid 15 feet apart, gave nearly 36,000 gallons per acre; while drains laid 3½ feet deep and 20 feet apart, gave at the rate of 47,000 gallons per acre, which was about one-tenth the rainfall of the district. It is clear from this experiment that a considerable portion of the rain descending on the surface either ran off at the time of the rainfall, and consequently did not penetrate to the depth of the drains, or it passed below them and out of reach of their action. In every porous soil a large portion of the rainfall could not be collected by drains placed a distance apart, as the water would penetrate deeper than the drains. From observations of some of the various works constructed for the supply of water from drainage areas, the amount of water taken and used varies from one-sixteenth to over two-thirds the rainfall of the district. There can be no doubt that if the surface of every drainage area was, or could be made, impervious, and sufficient slope be given to it to carry off the water quickly, a very large percentage of the rainfall might be used. But the great drawbacks to making the surface that should receive the rainfall impervious are—first, the expense; and, secondly, the restriction it would put on agricultural pursuits. The expense of making a surface impervious has been estimated by Mr. Hughes at £242 per acre, which price would exceed the value of the water that would be collected from it, so that if this system had to be put in operation at the present prices paid for water it would not pay. The sufficiency of the rainfall to furnish a supply of water may be derived from the fact that if two-thirds of the rainfall of England and Wales could be collected, it would furnish a supply to each individual of the population of a quantity exceeding 2,500 gallons per day; but the rain falling on the sites of our cities and towns would not be sufficient for a supply according to the present rate of consumption. For example, the most crowded parts of London are peopled at the rate of one person to every 12½ yards; now, taking this area with a rainfall of 24.8 in., if two-thirds of it could be collected, it would furnish 2.63 gallons per head per day. In the City of London one person has 40½ yards area, which with the same rainfall and at the same rate would furnish 8.54 gallons per head per day."

The water which flows from field drains or collecting grounds is far from being pure. It contains small portions of the soluble matter contained in the soil from which it flows. Some specimens of the water from the drains of various cultivated soils were some time since examined by Professor Way (*Jour. Roy. Ag. Soc.*, vol. xvii., p. 123). The following were the foreign matters (given in grains) contained in an imperial gallon of two (previously

filtered) drain waters, from two fields on the farm of Mr. Paine, at Farnham, in Surrey :

Silica	0.95	0.41
Phosphoric acid	trace	0.12
Salphuric acid	1.65	5.15
Chlorine	0.70	1.10
Lime	4.85	7.19
Magnesia	0.68	2.82
Peroxide of iron	—	—
Ditto and alumina	0.40	0.05
Potash	trace	trace
Soda	1.0	2.17

Then as to the soluble organic matter, ammonia, and nitric acid, found in land-drainage waters, in seven different specimens, from the lands of Mr. Paine, there were obtained (grains in imperial gallon)—

	Soluble organic matter.	Nitric acid.	Ammonia.
1	7.0	7.17	0.018
2	7.40	14.74	0.018
3	12.50	12.72	0.018
4	5.60	1.95	0.012
5	5.70	3.45	0.018
6	5.80	8.05	0.018
7	7.40	11.45	0.006

The ammonia and nitric acid contained in the rain water which supplies this drainage water varies considerably in different months. That falling at Rothamsted, in Hertfordshire, 20 miles from London, has been examined by Professor Way (*ibid.*, vol. xvii., p. 143). He found (grains) in an imperial gallon in—

	Ammonia.	Acid.
January	0.092	0.017
February	0.104	0.042
March	0.086	0.021
April	0.123	0.035
May	0.080	0.035
June	0.135	0.080
July	0.061	0.017
August	0.080	0.060
September	0.095	0.021
October	0.061	0.036
November	0.054	0.018
December	0.067	0.017

Of river water I need hardly remark that its quality varies with the nature of the country in which its springs arise, and through which they flow. Thus the water of the Clyde contains in an imperial gallon about 9 grains of foreign matter; that of other of our rivers as follows:

The Severn	about 4 grains.
The Thames	23 "
The Ouse at Ely	32 "
The Lea	24 "
The Colne	21 "
The Trent	50 "
The Dee	4 "
The Don	9 "

The most general mode of supplying our farm houses with water is from wells. The use of this kind of water in irrigation is common in oriental countries where a large amount of water is thus procured by either manual labour or other very simple and laborious modes. That the use for irrigation of the water obtainable from wells might be very beneficially extended in suitable situations I have no reason to doubt. The amount of water thus obtainable is much larger than is generally understood. There are two wells at Croydon, each of which supplies 1,000,000 gallons per day to that town; and it is from these, where the water drains from the town as sewerage, that the 250 acres of land at Beddington are so well irrigated. From other wells still larger supplies of water are obtained. The reader must remember that the water of the great wells, such as that of Croydon, all contain various saline and earthy substances. Mr. Latham has in the following

table given the results of the analysis of a gallon of five of these well-waters :

	LONDON shallow wells.	Exs, up- per part of city.	BURTON on TRENT.	CROFT- DOG.	BRAIN- TREE.
Carbonate of lime	30.50	25.10	15.51	15.14	2.40
Carbonate of magnesia.....	—	—	1.70	.61	11.30
Sulphate of lime	8.20	15.36	18.95	.53	—
Sulphate of magnesia.....	—	—	9.95	—	1.70
Chloride of magnesia.....	—	.18	—	—	—
Chloride of sodium.....	12.30	10.88	10.12	1.51	44.00
Alkaline sulphates.....	14.70	16.97	7.65	1.03	—
Alkaline nitrates.....	16.70	28.88	—	—	12.80
Iron alumina.....	1.10	.71	.60	—	traces
Silica.....	—	.11	.79	.93	1.30
Organic matters.....	—	.68	—	1.09	—
Total.....	83.50	101.90	65.28	21.11	72.50

The result then of the examinations of the water with which our lands are supplied, is full of interest and instruction. It is so, whether we regard that water as

merely for the use of our houses and homesteads, or as applicable for the irrigation of our grass lands. The grains of saline or organic matters per gallon which the water we employ contains we have noted to vary considerably in amount; and that variation there is no reason to doubt produces a material effect upon the health of the consumer. Neither must we omit to remark that the value of the soluble matter carried off from our soils by the drainage water is far more considerable than is commonly known. We can easily make an approximate calculation of the amount thus removed from our fields. If we take the rainfall at only 25 inches, that upon an acre of land is equal to 567,168 gallons, or about 2,532 tons a-year. Now about two-fifths of this quantity soaks or drains away, and about three-fifths evaporates, so that only one grain of any substance in a gallon of water amounts on the whole annual drainage of an acre of land to about 240,000 grains, or more than 34lbs. And this amount in those counties where the fall of rain is so much more considerable is proportionately increased.

THE HERDS OF GREAT BRITAIN.

CHAPTER XLVII.

THE SHOLEBROKE HERD.

'Twas June, when insects flushed with sun
Make horses kick and heifers run,

and a smart eight-mile ride we had of it behind two blood greys, one of them bred by the late Sir Tatton, from Blisworth Station to Sholebroke. Blisworth Gorse lay to our right, and a line of trees marked the boundary of "Tidfield Poor Allotments," which the Grafton pack know well. Lord Pomfret's house closes up a stately avenue of elms in the park, which is next year to be the scene of the Northamptonshire Agricultural Society; and another half-mile brought us to Towcester, on whose walls not a few quarters of good Midland wheat had just been transmuted into political paste. The time for another great county grapple was drawing nigh, and the Pomfret Arms and Talbot Hotel had broken out respectively into quite a Knightly blue and Grafton scarlet rash. Still, amid all this excitement, a few of the quieter spirits had time to think of more earthy matters, such as the building of a corn exchange, which Towcester needs right sorely.

Sholebroke lies about three miles from the town on the road to Buckingham, across the Royal forest of Whittlebury. The ring of the mattock and the axe has been heard in that forest for many a long year from Stoney Stratford to Astwell, and Porter's Wood no longer stands to mark its northern edge. On the uplands to the right, which gradually die off into Mr. Drake's country, and marked more especially by a tall tree clump, is Foscoote, where "Old Val" Barford lived for many a year, a breathing pastoral in himself, and firm to the last in his boast that his Bakevells were as much alike as his bees. The ghosts of the long arguments with which he used to enforce his infallibility, must still go sighing round those elms, like thin voices of the night, over the meagre result of the sale which sent the greater part of the flock to Cambridgeshire. Another mile, and we turned off sharp across a few fields, and there, lying snugly at the end of a small sloping glade, in which the fox cubs come out to play from the forest remnants on each side, is the white outline of Sholebroke Lodge, among its dainty purple beeches and rose trees. It was once the Deputy Ranger's Lodge,

and troops of red and fallow deer still roam among the oaks of their old Whittlebury Park domain within a bowshot of its windows.

Captain Oliver came here for the sake of the hunting in 1855, and took 400 acres, a hundred of which is arable, along with the Lodge, from Lord Southampton. The land is a strong clay, and grows wheat, oats, and beans well. Mangel's prosper fairly, but turnips have been a failure, and the land is too wet to feed them off with sheep. So far the Captain has cast in his lot with Shrops, and used tups of Freeford, Holland, and Bradburn blood. He lams about 130 ewes each year, and sells off the wedder hogs, and gimmer culls after shearing. Up to 1860 he was content with the common Shorthorn of the country, and then nothing short of pure blood would satisfy him. No man has bought more carefully or yet more dashingly at sales, and at present his herd numbers some sixty head. He is fond of a little rosette practice, but he seldom wanders farther afield than the Royal, the Northamptonshire, the Buckinghamshire, and occasionally the Yorkshire shows, and puts nothing under high pressure after it is eighteen months old. So far he has only visited the Royal twice, but he has never returned without cash or card. Lalage 2nd was second to Mr. McIntosh's Lady Oxford 5th in the heifer calf class at Worcester, while Roving Butterfly was commended among the bull calves, and again when he went to Newcastle.

Orange Blossom, from Mr. Crawley's sale in '60, was the first entry in his "Herd Book" pedigree. Then the Milcote sale furnished three more—Old Queen Anne by Baron Warlaby; Festoon, of the Finge tribe, by Kirk-leavington 4th, and Sincerity, of "the Charmer sort," as shorthorn men always phrase it. As yet, the Captain had not taken the oath of allegiance to any "sort," and that summer found him at the Ring-side, when Mr. Dudding's century made their fifty all round. From Panton he returned with three heifers—Rose of Cambridge by Superior, Autumn Rose by Vanguard dam by Baron Warlaby, and Anna by Vanguard. After that he looked out for Bates, and has made it his general rule to have it with an occasional dash of Booth to get more solidity. The general tendency of his breeding corresponds with our

old friend Easton's "Field and Fern" definition of Mr. Barclay's line of action at Keavil: "*We've mostly Bales, with a mixture of Booth for emergencies.*" The journey to Mr. Peel's sale at Lancaster was one of good omen. It was there that he first took his show-yard cue, by buying not only Lalage by Prince Imperial (15443) the dam of Lalage 2nd, but Cowship, the dam of Malachite, with her six weeks' calf Campanula, which was the second yearling, in a large class, to Lady Pigot's Rosedale at Stamford, and headed her class at Buckingham. Lalage was not easily bought, as Mr. Young from Keir was in the vein, and Captain Oliver had as smart a finish with him as he ever had with "The Squire," Mr. Percy Williams, Captain Pettat, and all the other silken heroes of his Croxton Park and Gorhambury days. However, at 230 gs., Mr. Young would have no more of it, and the Captain's "*and five*" decided it. He had to yield in turn four years after, when Mr. Barclay and Easton came all the way from Dunfermline to Lawford, to look after Seraphina 13th. But the latter shall give us this episode in his own words once more, as he told it to us when we were quartering Scotland like a pointer dog, for book lore: "*Come over my Seraphina 13th.* I met Captain Oliver lately, and he asked very kindly after her. He was our opponent at Lawford. He's not easily beaten off. I said to Mr. Barclay, 'Go in and give him another choker—it's as well to do right as wrong.' So we got her for 250 gs. She will be just three years and nine months, and she's had two calves, and in-calf again * * *" and so on.

Up to this point the Captain had not required a bull, but late in the January of '61, he turned his face Townley-wards on this very difficult errand. Culshaw gave him the choice of five, and he finally fixed on one of the twins, Romulus Butterfly by Butterfly's Nephew from Pageant, at 250 gs., and never repented his visit. Mr. Surtees's sale at Dane End furnished Baroness and her two daughters, Viscountess and Rose of Dane End, at an average of 63 gs. each; and then he once more set off North in search of a bull for these three, and to cross in future years with the Romulus Butterfly heifers. Mr. Atherton's sale was his destination, and Seventh Grand Duke his destiny. The Seventh was then a six months' calf, and as Mr. Robinson was equally hot on him, he and the Captain stood right and left of Mr. Stratford, and made their deliveries. They were no

"Simple pair, who simply sought renown,
By holding out to tire each other down,"

as the roan was something to be in earnest over. However, the Captain not only stayed longer than "Clifton Pastures" up to 320 gs., but took the four months Cherry Duchess 9th (140 gs.) as well, to fill up the North Western horse box.

Crinoline by Highborn (13028), a roan of great size and substance, with her head quite a study, was a purchase from Mr. Longland of Grendon, who brought the Duke of Devonshire's Lord of Oxford at upwards of 200 gs. into the county. She and Sonora were both dropping to calve, and it was a very fine point whether they would hold up long enough to get within the Royal limits. The 28th of June came and went, and so did the 29th, and each morning the spirit moved us to awake in the grey twilight, and peer into the glade from our lattice, to see if Crinoline was uneasy. On each of these mornings she "roamed mid the dew," and while Sonora "broke down on us," another Eastonian phrase, with a red heifer calf, eleven hours before July came in, Crinoline held happily on with a roan bull calf to the 2nd. Both of the youngsters were by Seventh Grand Duke. Three roans, for whom "The Seventh" and Romulus Butterfly were supposed to have lived and loved in vain, were spending their last summer-days in

the Stripe. One of them was Baroness, a fine old roan with a down-curved horn; Barmaid, bought from Ellis Clark, now Mr. Roberts's bailiff, was a great milker in her day; and Autumn Rose made up the trio. Another two months' trial has induced a belief that they have all turned over a new leaf.

From this Penitence Pasture, we passed to the Far Field, where the jilts are freshened up again after being put on short commons. Orange Blossom by Tambour (15366) and her daughter Orange Bud by Romulus Butterfly were both there, the former a very good-looking cow, and it was a thousand pities to find another like Rose of Dane-end under a cloud. From here we went back to the farm-buildings, part of which were the "old original" Grafton kennel. The cows were in a sort of covered barn, reminding us of the "Clifton bins," and furnished with stalls along one side, and those good old-fashioned wooden neck-stocks which fasten each cow in an instant, and save chains. "Malachite's dam for a thousand" would rise to any one's lips, if they had ever seen the bull, and, save in the dams of Forth and the Hereford Sir Richard, we have seldom seen such a likeness between dam and offspring. This Cowslip 5th by Chieftain (10048), from Cowslip 2nd by Duke of Norfolk (5952), is no belle of the steading, but she has been a serviceable one both to Mr. Ambler and Mr. Peel, as well as the Captain, during her 14 years. Her birthday record must have been lost, as she heads the catalogue simply as a "roan of 1851." The neck is a peculiar feature in her, and she is a rare milker. One calf by Duke of Geneva died since she came to Sholebroke; but the tribe has prospered in females, as her Campanula by Valasco and Crystallina by Grand Duke 7th are both in the herd, and so is her granddaughter Campanella by the same bull from Campanula. Near her was the perverse Anna by Vanguard, dam Adora by Belvedere 4th, the breeder of three white bull calves, and then of a roan in succession. The neighbourhood profits therefrom, but it is to the Cherry Duchess and Lalage lines that Captain Oliver looks for his bulls. The white Festoon had put out one roan blossom in Filigree by "Duke," and another Adkins (which never leaves her side), Sincerity of the Charmer sort, with fine depth of flank, and a shoulder which old Sir Charles would have paused over in his day, had fused with Romulus Butterfly in Sonora, on whom the bull had put his own gay head. Then came the lengthy red Lalage with her fine speaking eye, and the dam of three heifers. Her Lalage 3rd died; but Lalage 2nd was there, relieved from all show toils, and with that sweet arm and deep breast which set off the good form and flesh points, that carried the second honours for her at "the faithful city." Orange Fruit by Booth's First Fruits was a useful cow, and had made up the quartet of Oranges with her Orange Flower. Romulus Butterfly and the deep-bodied Autumn Rose by Vanguard, from Admiration by Baron Warlaby, had hit nicely in Adela; but she was out of sorts that day. Wily Witch, with a deal of Mr. Wetherell's blood in her, was there to tell of Bashey; and Cherry Duchess—with her fine eye, back, and quality—of the July day at Speke. She has been a lively breeder, and at three years and four months we found her the dam of Cherry Grand Duchess, and Cherry Grand Duke by her railway partner of that day.

Some side-bins were then opened, and out came the prize-fighters of the hour—the white Campanella, and Creole by Hayman (son of Highborn) from Crinoline by Highborn. In-breeding had not affected her rich deep flesh, but there was a chubbiness about her forehead which pulls off a point or two for elegance when she is drawn up with the bigger Campanella. The Captain had therefore duly declared to win with the latter in the Northamptonshire Show, and did it cleverly enough. There were two pro-

missing ones of the younger generation, roan and white—Crystallina and Lalage 4th, both of them by Seventh Grand Duke. A close kinsman, King Christmas, the first from "the Worcester calf," was in the boxes outside, with his half-brother King Bomba, who was out of form, but still nice in his touch. Little Cherry Grand Duke was near them, with only six weeks, and a wedge-like white blaze on his head, and the blood of four Grand Dukes—First, Second, Third, and Seventh—in his veins.

From him we journeyed past the hayfield and the remnants of the kennel to which the Grafton hounds adjourned from Sholebroke. The farm-bailiff lives in Tom Rose' and George Carter's old house, and the groom and garrulous dealer in the first and second whips'. A troop of white dorkines were in possession of the boiling-house, and the kennel-yard was partitioned off for bull-boxes. Tom Ross and George Carter were men of very different styles. The former loved his "wild boys" to the close, and gave as his reason that "nine out of ten days I am in a wood, and those are the sort that will have him. What you call a good pack will never catch a bad fox, and as I want to hunt *him*, instead of his hunting *me*, my hounds are the ones for the country!" George Carter, on the other hand, fought hard to make them steady, and, in the words of Sir Charles Knightley, he "was the first man in that country who could ever catch a good one over the open." But three-and-twenty seasons have rolled over since the hounds were seen in that paddock, and Cherry Grand Duchess, a very thick-fleshed, good-looking red, like the

Lalage lot, and her half-sister Adelina browse there now. So on we went to the bull house, and into the lion-headed presence of Romulus Butterly, a fine grey roan, with a beautiful touch, and a remarkably good coat. Legs, loin, and head were all grand points in Seventh Grand Duke, who carries out the fine level promise of his calf-hood, and has never been made up in his life. Half-a-mile more and we are riding past the fox-proof fence, which runs round the flower gardens of Whittlebury, from whose blackened ruins Lord Southampton's new house is beginning to rise. Grafton kennels about here are as thick as deserted gipsy encampments in the Cambridgeshire lanes; and we found the third at the edge of the Forest, from which, when Lord Southampton gave up the mastership in '61, the hounds moved on to Wakefield Lawn. Stowe Obelisk is just visible in the distance. The direction of Wicken Park is indicated to us, and we learn that the grand old Marmaduke and Duke of Geneva are about to arrive there, on a visit from Penrhyn—the latter with an eye to the Northamptonshire bull championship which he won. The name of Robarts and Lillingstone Dayrell bring back Lady Barrington, Diadem 4th, Roan Duchess by Mayduke, and many another good fight amongst Mr. Stratford's waggons; and we meet some sturdy specimens of Lord Southampton's waggon horses, all blue roans and a dozen strong, as we head back to Sholebroke for the night.

H. H. D.

THE NEW PART OF THE ROYAL AGRICULTURAL SOCIETY'S JOURNAL.

THE CATTLE PLAGUE.

The summary of contents to the new Part of the Royal Agricultural Society's *Journal*, as now just published, is very suggestive of the spirit of the age in which we live. Practice with Science would appear to have fairly tired of trying to grow corn at our present prices and prospects, and accordingly all the leading papers turn on the care and cultivation of stock. The opening article is a prize essay on the management of sheep by Mr. Coleman, and the second an inquiry into the reproductive powers of domesticated animals by Professor Tanner. Then, Mr. Reynolds, a veterinary surgeon, writes on a new form of disease amongst lambs; while Mr. Dixon gives us a history of the Shorthorn, and Mr. Evershed comes in again with something more upon sheep. The comparative profit from making cheese or butter, selling milk, or grazing, is the subject for a comprehensive treatise provided by the Society, and written up to by Mr. Heywood, well-supported as this essay is by another from Mr. Carrington on Dairy Farming. Mr. Herbert, as usual, supplies us with the statistics of live stock, of dead meat, and of wool, and Mr. Clayden writes briefly of the advantages of lucerne as fodder for animals on the farm. Thus, of eleven leading articles, as it were, Mr. Clutterbuck and Professor Voelcker are only allowed to trespass on the more popular questions of the day, the former with a rather dry treatise on water-supply, and the Society's chemist with some observations on the functions of soda-salts in agriculture. Amongst the head-and-tail pieces there are also Mr. Dent Dent's well-digested report on the exhibition of live stock at Plymouth, an address by Mr. Ellman on the breeding and management of sheep, and another by Doctor Budd on typhoid fever in pigs. On such a showing there is little doubt but that many a member will cut into his copy of the *Journal*

with more anxiety than usual, and yet we question whether he will not be more than ever disappointed. This is the concluding Part for the year 1865—a time memorable in the annals of Agriculture for the sensation created by the outbreak of the Cattle Plague. And yet the future historian will turn and search in vain through the pages of the Royal Society's *Journal* of this same year for a single sentence referring to the disease, its ravages, or the preventive measures adopted. The Editor has not a word to say on so momentous a subject, the College has clearly had no time to make any communication, and the Veterinary Committee, curiously enough, do not ask for a few pages wherein to reprint the address they have so recently been circulating in the form of a letter. It is true there was not much new matter in this, but the paper was carefully drawn, and included so many authoritative suggestions and directions as to render the *Journal* the place of all others for its embodiment, mainly of course by way of a reference for hereafter. A man binds his books and burns his letters: and if the address of the Veterinary Committee was worth issuing, it was certainly worth preserving in some more substantial form. So far as we have yet had any opportunity of studying the Michaelmas part, we only gather from Mr. Herbert's article, which is given without any date, that "fortunately very few losses have been sustained by disease in any of our leading grazing districts; but we understand that just at the end of June a kind of gastric fever broke out amongst the cows and heifers in various parts of the country, which, unless speedily checked, is likely to lessen our supplies materially." Surely, considering the time that the sheets of the *Journal* are passing through the press, we might, in the

way of an occasional foot-note or otherwise, have heard something a little more definite as to this kind of gastric fever, even if the Editor were too much engaged to give any summary of all that had occurred so far, or the Veterinarians to send in their rules and regulations for the due observance of symptoms or the adoption of preventive measures.

This reticence is the more remarkable in such a quarter, as there is scarcely a paper or a periodical but which has had something to say on the subject. This something, we are quite ready to admit, has not been always offered on the highest showing; but one of the first means for our safety must be in directing men's minds to the matter, and where should we look with more reliance than to the pages of the national Society's own organ? Anybody may write to *The Times* or *The Mark Lane Express*; while a communication inserted under the auspices of the Hanover Square Council would of course carry every possible weight and authority with it. But the probability is that we shall have to wait for another half-year, or until the disease has died or been starved out, before we get any further advice from head-quarters. In the interim we must be content with what we can glean from the papers, and certainly our powerful contemporary in Printing-house Square evinces every disposition to give everyone a hearing. Indeed, in *The Times* of last Thursday there are two letters following on in the same column, that come in amusing comment one on the other. In the first place Mr. Edmund Tattersall, of the well-known Hyde Park firm, is allowed to express his belief that the disease is the rinderpest, as that he believes "nothing of the spontaneous nonsense theory." To be sure, he offers no proof of either one or the other, as no one has yet been able to trace the introduction of the evil from abroad, whilst there are many causes existing amongst us that might have tended to generate such a plague. However, Mr. Tattersall has met with an officer in the Austrian service who spoke confidently of the disease being rinderpest, as that it would kill a great proportion of the cattle in England. And this is the remedy: "He told me that when it had made its appearance in Austria, as soon as it broke out in a particular district, a line was drawn around the parish, varying in circumference, and every head of cattle killed, whether attacked or not, and no cattle allowed to go on to the infected ground for a given period. Experience had proved that it was the only effectual means of stopping this dreadful disease, which he had known to destroy immense herds. I inquired who compensated the owners of the cattle, and he said the Government!" Whereupon J. R. H., writing from the Union Club, tells how "a farmer in Suffolk had the disease among some of his cattle, but had also quite separated from them, and shut up in a separate shed, with the door almost constantly closed, a perfectly healthy fat heifer, which he did not show to the inspector, but sent to market when ready. It appears to be distinctly admitted that there had been no contact between this animal and the diseased ones, but it was supposed that some diseased animals had been driven past the door of the shed it was confined in. For this, which the magistrate construed into 'contact,' the farmer was fined £10 and costs." And further, "To show the ignorance of the inspector, I refer to your columns, where it appears that the only two cows out of a herd of thirty that were saved had been condemned by this very official, but as they were in a part of the field out of his jurisdiction the farmer refused to kill them." Mr. Tattersall, speaking as a consumer, says, "Take the bull by the horns, and kill everything;" while J. R. H., who does not pretend to be disinterested in the matter, but owns to being a large landed proprietor and to having over 120 herd of cattle, maintains that "the present sys-

tem of indiscriminate slaughtering, though it may greatly raise the price of meat, will never effect what we want—a cure." For our own part, and as in some way reconciling these contradictory opinions, we are inclined to think that the precautionary means already adopted under the active agency of the Government have done much to stay the spread of the disease, and that it may be eventually subdued without proceeding to such extreme steps as those which Mr. Tattersall and his Austrian friend advise; even admitting that the plague is of foreign introduction. In some districts we know that a kind of panic has come from the very slightest causes, and though cattle have been kept back from many of the autumn shows, this has been done almost invariably as an extra precaution, and not from any "ease" being really known of in the neighbourhood of the meeting. In referring last week to the abandonment of the Hereford Show for this year, we concluded that the great Hereford Fair would also stand over; but Mr. Duckham now writes to say "it will most assuredly take place unless some visitation of which we are not at present aware should befall this county. Thank God, the stock of the county was never in a more healthy state than at the present moment, as far as I know; and even if otherwise, I feel I should not be long before being made acquainted with it."

We subjoin some very sensible remarks from *The Times*, as to the commonly-accepted theory of the plague having been brought from abroad, when the Veterinarians cannot as yet offer an atom of proof to that effect:—

If the plague is epidemic, it will travel in spite of the most complete isolation of diseased cattle, nor could we stop it by the instantaneous slaughter of every infected herd. This theory would enable us to attempt a cure, and to resort to remedial measures, instead of endeavouring to extirpate the pestilence by the wholesale massacre of sufferers. Upon these principles, if they could be approved, our whole policy might be modified. We should look for the causes of mischief at home rather than abroad, and should think more of our own cowsheds than the conditions of pasturage in Russia.

The other theory is one which in former times was applied to all plagues whatever, but which in all cases, except this new case of a cattle plague, has been deliberately exploded. What is said now of the Russian "*rinderpest*," was said in as many words of the Egyptian plague. That plague used to visit us periodically, and was invariably ascribed to a shipload of infected substances; yet we never get the plague imported now. We are told that a century ago this very cattle disease came to us from the same source. That it should be traced to foreign importation then was perfectly natural, for nobody believed in any other origin of plagues; and it is precisely because the doctrine is still calculated to commend itself to our prejudices that we should begin by putting ourselves on our guard against the temptation. It is so conformable with our old notions of pestilence to believe that the disease is none of our own, that we should be suspicious of so plausible a theory. So many matters are settled, so many questions put at rest, and so many obligations dispensed with, by looking at this plague as a spark thrown among us, to be stamped out with the foot, that such a view of the case should be very narrowly examined. A really philosophical inquirer would think the chief burden of proof thrown upon those who declare the cattle plague to be a purely Russian disorder brought hither by Russian beasts.

Let it be conceded at once, for it does not seem to be anywhere questioned, that the disease now among us is identical with the disease well known in Russian pastures, and there termed the "*rinderpest*,"—the next step is to prove that the *rinderpest* could arise nowhere but in Russia. It has been observed that the conditions of animal life on the Eastern steppes must needs be peculiar, and likely, therefore, to generate a peculiar disease. Possibly; but then we know that this disease in itself, so far from being peculiar, is the very commonest, most universal, and most easily produced of all the diseases known to man. It is nothing whatever, notwithstanding its outlandish name, but typhus fever—the name indeed by which the French actually call it. We know fur-

ther, too, that if the susceptibilities of cattle resemble those of men, the conditions of life in metropolitan cowsheds are far more naturally calculated to generate typhus than any state of things which could exist upon open steppes. Doubtless the fact remains, and is not without its weight, that our cattle did not get typhus fever till now, however ill they might have been housed; but then it should be remembered that British cattle of 1865 are not exactly the British cattle of former years. We have imported very largely, and mixed our stocks, and we have been rearing and feeding our beasts on entirely new systems. Then, the season has been a most exceptional one, and for months together we have had the burning heat of more southern climes. Again, however, it is to be stated that just when this plague did break out, cattle did come in from Russia; but, again, it must be asked in reply, Did not cattle

ever come in from Russia before? We know perfectly well that within the last few years murrains just as fatal and destructive as our own have ravaged all manner of lands, especially Egypt. Was it really from Russia that the cattle plague got to the Nile? If there was nothing in the air, but everything in contagion, is it not remarkable that a Cattle Plague should have travelled about the shores of the Mediterranean, just as another plague, not traceable to Russia, is doing now? Is it not curious that the disease should appear here and there on the continent of Europe, and go away again as mysteriously as it came? Is it not strange that in our own country at this moment we should have cases of infection, like that of Lord Sydney's cattle for instance, which not even the most overstrained theory of contagion could possibly explain?

THE BUCKS AGRICULTURAL ASSOCIATION.

MEETING AT AYLESBURY.

This Society carries a more lengthy title than it would be convenient to place in a head-line, having been known for the last seven years as "The Royal Bucks Agricultural Association and Central Bucks United." Union in this instance, no doubt, has been strength; for, strange as it may sound, the uses of the annual meeting were for some seasons fairly frittered away by two shows held at the same place, and embracing precisely the same district. There was the old original Royal Bucks, so long identified with the late Duke of Buckingham, more especially during the time he represented the county as Marquis of Chandos; and the new Central Bucks, which traced its establishment mainly to the advancing interest of the Rothschild family. Considering that these rival houses agreed, at any rate, in making Aylesbury their head-quarters, the absurdity of such antagonism soon became apparent, and an amalgamation of forces was necessarily brought about. This centralization, however, is by no means so complete as it should be, for the Royal Bucks or the Central Bucks means, after all, but little more than the Hundreds of Aylesbury, and the gathering altogether scarcely assumes to anything higher than a certain local influence. This is easily accounted for, as there is another Buckinghamshire Show to be celebrated at Buckingham next week; and thus, while the neighbouring counties of Bedford and Northampton have brought all their tributaries to one fountain-head, Buckinghamshire like Oxfordshire encourages a succession of minor meetings that hardly rise beyond the character of parish ploughing-matches. There is a narrow-mindedness about this hole-and-corner business that cannot be too soon corrected, although we are fain to admit that we have been anticipated in much we were prepared to say as the result of our visit on Wednesday, by the President of the occasion. If the exhibition itself be of no great moment, there is always something of a treat in hearing a finished orator like Mr. Disraeli address his constituents; and it was amusing to see some of these driving up just too late for the show, but just in time for the dinner. It is only to be regretted that this should continue to be held in the narrow room at "The George," as surely there should be some public building better fitted to the purpose, however well such accommodation may have answered five-and-twenty years since. As we have intimated, Mr. Disraeli was in the chair, and no one certainly could have performed the duties of such an office more efficiently. Avoiding, as is now his wont at these meetings, any political manifesto, he touched lightly on the harvest and the elections, traced the cattle plague back to the days of Virgil and the Georgics, and then earnestly addressed himself to advanc-

ing the fortunes of the Association whose business he had been called upon to conduct, in a speech that should give it a far higher standing amongst such institutions: "If I look technically over our usual authorised catalogue, and compare it with those which have been published for the last three, four, or five years—even from the time when the junction took place between the two societies, and which it was supposed would give increased energy and greater exertion to the county—I cannot see that there is any material feature to call your attention to. The aggregate entries of the last five or six years are not reduced, the number of exhibitors is not diminished, the amount of money given in prizes is not decreased, and one might make a very plausible, popular appeal upon each, and come to the conclusion that, if not progressive, we are at least conservative in our position. But when I analyze this catalogue, I find some results and circumstances which, to me at least, are not satisfactory. If I look to the number of contributors to the exhibition, I find that nine-tenths of them are furnished by the county of Buckingham. That does not look as if there was any great competition with other counties; but what is more, these nine-tenths of the county of Buckingham consist of dwellers within a particular district of the county. That has a tendency as little as in the former institution to competition, which is supposed to be the mother of excellence. That is one feature well deserving of attention. There is another which I do not like. I do not see that the landed proprietors of the county are included in the increase, in the manner which we have a right to expect. Indeed, with the exception of one who is absent—the squire of Aston Clinton (Sir Anthony de Rothschild)—whose boundless liberality and good-natured energy have exhibited themselves on these occasions with so much effect, I scarcely find any individual of that order doing what I conceive to be his duty to the county of Buckingham under these circumstances. And what is the cause of this? I cannot believe that the landed-proprietors are deficient in a sense of duty; I know they are the reverse. I cannot believe that amongst the tenant-occupiers of Buckinghamshire there is any want of emulation; I know from personal experience that the contrary is the fact. There must be some reason for the present state of things. Why is the state of Buckinghamshire different from that of the county of Northampton, or any other county? We have here a county association. It is invested with the halo of Royal patronage. It meets, and you know the consequences of its meetings. They are different from those which occur in contiguous counties. A gentleman has recently given me a description of the show in the county

of Northampton which may be interesting. Now, there is nothing in the county of Northampton which should give it an advantage over the county of Buckingham. But the Agricultural Association of the county of Northampton met the other day in the city of Peterborough, and I have been told by more than one gentleman that there was an exhibition of stock like that of the Royal Society in miniature, and hardly in miniature. There were contributions from men in distant counties competing for prizes; there were hundreds of pounds taken in the show-yard from those who were anxious to view the exhibition. The first gentry of the county of Northampton were present, and there were troops of tenant farmers not only from every part of Northamptonshire, but from the bordering districts, full of animation, of the spirit of rivalry, and of the creative spirit of competition; and such were the numbers and such was the excitement and interest created, that the show was kept open for two days. I want to know why these things do not happen in the county of Buckingham. Gentlemen, I want to put the question before you in a business-like point of view. It is not always viewed in that way, and can only be viewed properly through the medium of an enlarged and considerable experience. Now, what was the consequence of the great change in the laws which regulated agriculture some years ago? We are not here now to question the propriety of those changes which we have witnessed, and which have been the subject of controversy; but we have a right, and it is our duty, to ascertain the results of that change, and I say that the results of that change are no doubt these: That the owner or the occupier of the land can no longer count upon the price of wheat as the principal source of his revenue or his profit. Well, though you are placed in a different position, you have less cause to complain than most men have, for a bountiful Providence has favoured the county of Buckingham in possessing the finest pastures in the country. You mainly depend upon your herds or flocks; but when you form societies like the present, the principle of which—to use the language of your constitution, and better language was never before employed—is, though I may not quote it correctly—but I give the spirit of it—to promote the cultivation and improvement of agriculture and husbandry, to improve stock, to encourage and foster all experiments that may tend to the advantage of the soil, to offer premiums for the emulation of all classes, and for the improvement of all implements in agriculture; I ask, what does that language mean? It means this, that the society is formed really to maintain and increase the sources of your wealth. You must consider in forming these societies whether you attain objects by which your wealth is to be maintained and increased. Gentlemen, I must say that I do not think the present system is one which will effect the object. The reason is that the position we have taken is by far too local. Now, I should be the last person to speak with any depreciation of the local sentiment; for the local feeling is the dearest and most precious, as well as the most captivating and enduring influence that can govern men. But for all things there is a season. The hedger, the thatcher, the dairymaid, the ploughman, the cottager, who is encouraged to practise habits of cleanliness by rewards—these are parties who can very fairly be brought under the influence of a local institution. But when you come to the exhibition of stock—stock which is to be the source of your worldly prosperity—what you want is excellence, and you can only obtain that excellence by competition. Therefore, I describe your position as somewhat unsatisfactory; for really you have been attempting to do two things at the same time which are perfectly incompatible—to reward local merit, and to aspire to national and general excellence. But the thing has been so done that that which has been and ought to

be in its constitution a great county and a national society, has been mistaken by the landlords of the county for a mere Aylesbury ploughing-match. I think the time has come when we ought to consider how we shall meet the difficulties of our position. How should we answer the question, Why is the great county of Buckingham inferior to Northampton? Why have we not those great exhibitions which are an example and incitement to all England? Now, I ask why do not these events take place in this county? I do not believe that it is possible for us to shun this question. My opinion is this, that you have made a mistake in mixing two things together which ought never to have been united. There are of course local qualities, accomplishments, and virtues, which only those who are on the spot can recognize and reward. Let those be attended to. Let us in this district maintain and fulfil those objects of a local nature; for I must confess my belief that all those local rewards which have been offered have hitherto been perfectly successful. At the same time let us by some decided step appeal to the county, so that we may have an annual exhibition of stock and skill which will test the position of the county of Buckingham in the country to which it belongs.²⁷ This admirable address may be studied with advantage by the directors of other associations where the aim has been to farm out the premiums year after year amongst their noble selves and a few friends and neighbours, as to regard the stranger who can show a better animal with jealousy, or some yet stronger prejudice. It is contrary to the spirit of the age to imagine that a locality can advance proportionately with the rest of the world by keeping itself to itself; and even the best of men may grow weary of winning each other's money. As it was, the success of the show of Wednesday last was materially weakened, from prudential considerations having led to the withdrawal of the cattle, which would otherwise have supplied the chief feature of the occasion. There are a number of well-bred Shorthorns now to be found about Aylesbury, and the catalogue went far to confirm this; but, about a week since, Mr. Robinson, of Clifton Pastures, and Mr. Coleman, of Woburn, the appointed judges, were countermanded, and the actual exhibition confined to horses, sheep, pigs, roots, and poultry. These several sections were respectably filled, and amongst the cart-horses, without any particular deference being evinced for any fixed stamp or sort, there were many useful working animals. Mr. Mumford, of Chilton, took first and second in a good class of all-aged plough-horses; Mr. F. Cox, of Beachendon, the first prize, and Mr. Kingsley, of Boarscroft, the second, amongst the two-year-old geldings; and Mr. Terry, of Quarrendon, first and second in the companion class of fillies, where Mr. French, of Upton, showed another good one, and Mr. Rose a nice yearling, also commended, and out of his first-prize mare, where Mr. Beunett, of Rousham, finished second in the face of no further competition. The riding-horse classes scarcely came up to the standard which one would look for in the famous Vale of Aylesbury, although amongst the horses or mares for hunting purposes there were two or three very clever young ones by the Baron's horse, North Lincoln. The winner, Mr. Allender's three-year-old, is a very stylish taking colt, full of quality, and with noticeably fine action, having the walk of a race-horse. He is already known in the show-yard, having taken a prize at Oxford during the summer, and finished a close second in a good class at that great Peterborough meeting to which Mr. Disraeli referred so continually in the way of example. Acting on some extraordinary impulse, Mr. Denchfield, of Burston, entered a very clever yearling filly, also by North Lincoln, here, instead of in her own proper class, where she must have won; but his two-year-old, though the best yearling of last season, is grow-

ing a deal more like a harness-horse than a hunter. The dozen of hackneys were about the most incongruous collection ever brought together; and as there was not a decent goer amongst them, shape and make declared in favour of a really sweet mare to the eye, exhibited by Mr. G. A. Lepper, but bred by Baron Rothschild, by Kingston, and as thorough-bred as Eclipse, but not much of a hack to ride, though said to be a clipper with a collar over her head. The five nag yearlings entered for the Baron's Cup were a weedy lot, with the exception of the prize—a big-boned powerful black colt of Mr. Curtis', that looks like growing into money; though Mr. Denchfield's bay filly would have had an easy victory had she been entered here, and the judges were half inclined to have her back again. Hitherto, we hear, the offer of this cup has been coupled with a most extraordinary condition. Although given under the auspices of the Association, Baron Rothschild has stipulated for the appointment of his own judge, in preference to leaving this in the hands of the gentlemen nominated by the committee. Such a plan has worked anything but satisfactorily, as at best but a bad compliment to the officers of the Society; and we would really suggest to the latter that, if only out of respect to themselves, they should respectfully decline to recognize any premium associated with any such terms. The class had far better be exhibited at the donor's own place.

The Oxford Downs find most favour here amongst the sheep, and Mr. Disraeli at the dinner claimed the first-prize cup for a protégée of his own, as "a cross between the Down and the Cotswold, so that the observations I made at one of your meetings last year have been sanctioned and confirmed by the opinion of your judges." The award, however, in favour of Mr. Morris's sheep was not so emphatically confirmed by the public, who rather went for Mr. Shrimpton's theaves as the best pen in the yard, and a very handsome uniform lot they were. Amongst the other winners for sheep were Mr. Treadwell, of Winchendon, with an old ram bought at Battersea of Mr. King Tombs, but tracing back to Mr. Gillett's flock; Mr. G. A. Lepper, second in the same class; Mr. J. K. Fowler, first and second for ram lambs; Mr. R. Fowler first, and

Mr. Badrick second for fat ewes; Mr. T. P. Terry, second to Mr. Morris' cup pen of fat wethers; Mr. T. Hughes and Mr. J. Osborne first and second for long-wool ewes; and Mr. Shrimpton first and Mr. Badrick second for Down or Oxford Down ewes.

There was a suspicion of disease amongst the pigs, so that Mr. Allender kept his Berkshires at home, and some of those exhibited were in quarantine; but Mr. Ducking's whites all the way from Lincolnshire were of course invincible; and Mr. Clarke of Haddenham with his Berkshires, Mr. Elliot of Hulcott, and Mr. Treadwell of Winchendon were also successful with some very smart pigs. Mr. J. K. Fowler is a really great man with "twenty pens of poultry" at his back; there were some capital collections of roots, and some clean lumps of butter fresh from the Aylesbury grass grounds; while on the plough Messrs. Ransomes and Sims were still emphasizing the success which has this season attended their career. Their man was again the champion ploughman, though the Howards won the day previous at Woodstock, and could not here come into competition, not having entered in time; but they had the satisfaction of seeing one of their ploughs win in the local class, and Mr. Taylor of Studham taking the silver cup as the owner of the prize team. There were also well-arranged prizes for farm-labourers, shepherds, herdsmen, and dairymaids, with ten pounds offered by the President of the year for the best collections of cottage-garden produce—very equivocal means to a good end, at least in the opinion of some people, though we rather concur with Mr. Disraeli in "the belief that all these local rewards have hitherto been perfectly successful."

The following gentlemen acted as judges—

Horses: Mr. H. Corbet, Farmers' Club, London; Mr. Wiggins, Thumbly Hall, Worminghall. Sheep: Mr. Longland, Grendon, Northampton. Pigs and Ploughing: Mr. C. Hedges, Eaton Bray, Dunstable; Mr. J. Godwin, Troy Farm. Butter: Mr. T. Lipton, Newgate Market. Root Crops: Mr. J. Lucas, Weedon Lodge; Mr. G. M. Allender, Shipton Grange. Roots in the yard and Vegetables: Mr. E. Stone, Wotton Underwood; Mr. J. P. Parrott, Ford.

DERBYSHIRE AGRICULTURAL SOCIETY.

The annual meeting of the Derbyshire Society was held on September 20. The display of first-class stock was good, indeed there were few inferior animals exhibited. In the principal classes the entry was not large, but the stock which was sent was equal to any that has been seen in this part of the country for some time past. The horses were excellent; the mares and foals having never been surpassed at any meeting of this Society, and the whole of the classes were fairly represented. The show of pigs was poor. Some excellent specimens of sheep were shown, and in this department the show may be said to be fully equal to those of former years. The judges were—Cattle: Mr. Buckley, Normanton; Mr. Brough, Allsopp-en-le-Dale. Horses: Mr. Bland, Thorpe Lodge, Newark; Mr. Wright, Wandip, Leicester; Mr. J. E. Bennett, Husbands Bosworth. Sheep: Mr. Dixon, Barff House, Beverley; Mr. May, Elford Park, Tamworth. Pigs: Mr. Lowe, Tamworth; Mr. Whitworth, Measham, Atherstone.

The following is the award of premiums:

CATTLE.

Four cows for dairy purposes.—1st, 10*l.*, J. Hodgkinson, Allestree; second, 5*l.*, J. Brough, Kirk Langley; 3rd, 3*l.*, R. Gibson, Swarkestone.

Pair of cows for dairy purposes.—1st, 5*l.*, W. Fletcher, Radmanthwaite; 2nd, 3*l.*, J. Foster, Thulston.

Shorthorned cow, combining in the greatest degree milking and grazing qualities.—1st, 5*l.*, W. Fletcher, Radmanthwaite; 2nd, 3*l.*, S. Wade, Mickleover.

Pair of heifers under three years old.—1st, 5*l.*, W. Fletcher, Radmanthwaite; 2nd, 3*l.*, J. Faulkner, Breby; 3rd, 2*l.*, J. Tomlinson, Allestree.

Pair of heifers adapted for dairy purposes.—1st, 3*l.*, J. Porter, Weston-on-Trent; 2nd, 2*l.*, J. Faulkner, Breby; 3rd, 1*l.*, E. Canner, Locko Grange.

Pair of storks under two years old.—1st, 3*l.*, W. Fletcher, Radmanthwaite; 2nd, 2*l.*, ditto; 3rd, 1*l.*, ditto.

Pair of storks for dairy purposes.—1st, 3*l.*, J. Faulkner, Breby; 2nd, 2*l.*, R. Sybray, Snitterton; 3rd, 1*l.*, J. Milnes, West Hallam.

Shorthorned bull, two years old and upwards.—1st, a silver cup or plate value 5*l.*, Charles Bosworth, Dishley; 2nd, 3*l.*, R. Sybray, Snitterton Hall.

Shorthorned bull under two years old.—1st, 5*l.*, J. Ironmonger, Measham; 2nd, 3*l.*, Wm. Fletcher, Radmanthwaite; 3rd, 2*l.*, E. Canner, Locko Grange.

Best yearling bull of the pure Shorthorn breed.—1st, 5*l.*, W. Fletcher, Radmanthwaite.

For the best animal in the first 10 classes, a silver cup or plate value 5*l.* to W. Fletcher, Radmanthwaite.

Four rearing calves.—1st, 3*l.*, J. Brough, Kirk Langley; 2nd, 2*l.*, George Bryer, Markeaton; 3rd, 1*l.*, J. Brough, Kirk Langley.

Fat ox or steer of any breed.—1st, 3*l.*, G. J. Mitchell, Newton Solney; 2nd, 2*l.*, W. T. Cox, Spondon.

Fat heifer or cow of any breed.—1st, a silver cup or plate

value 6*l.*, W. Fletcher, Radhaunthwaite; 2nd, 4*l.*, W. T. Cox, Spondon; 3rd, 2*l.*, G. J. Mitchell, Newton Solney.

HORSES.

Brood mare and foal for agricultural purposes.—1st, a silver cup or plate value 5*l.*, J. Beeston, Mackworth; 2nd, 3*l.*, R. Gilman, Longford; 3rd, 2*l.*, W. Weston, Burley Grange.

Two-year-old gelding or filly for agricultural purposes.—1st, 5*l.*, J. G. Thompson, Chilwell; 2nd, 3*l.*, W. Bull, Egginton; 3rd, 1*l.*, E. Thompson, Breaston.

One-year-old gelding or filly for agricultural purposes.—1st, 3*l.*, J. Beeston, Mackworth; 2nd, 2*l.*, Mrs. Tatam, Little Eaton; 3rd, 1*l.*, R. Marple, Aston-on-Trent.

Brood mare and foal, for breeding hunters or hacks.—1st, 4*l.*, Eggleston Thacker, Ambaston; 2nd, 2*l.*, J. Pegge, Littleover.

Pair of horses for agricultural purposes.—1st, 3*l.*, W. Wilkins, Weston-on-Trent; 2nd, 2*l.*, Ann Eley, Hill Top, Longford.

Colt or filly, of the value of 50*l.*, not thorough-bred, under four years of age.—1st, 5*l.*, R. Sale, jun., Normanton.

Best cob, under 14 hands, for riding or harness purposes.—1st, 3*l.*, Mrs. Hartley, Kedleston; 2nd, 2*l.*, W. Chambers, Coxbench.

Best hunter, four years old and upward.—1st, 10*l.*, J. Stevens, Dale Abbey; 2nd, 5*l.*, G. Wheelton, Derby.

SHEEP.—LONG-WOOLS.

Five breeding ewes, having had lambs in 1865.—1st, 3*l.*, C. Bosworth, Dishley; 2nd, 2*l.*, M. Scorer, Scarliffe; 3rd, 1*l.*, C. Bosworth, Dishley.

Five long-woolled theaves.—1st, 3*l.*, M. Scorer, Scarliffe;

2nd, 2*l.*, George Bryer, Markeaton; 3rd, S. Saint, Alkmonton.

Five long-woolled ewe lambs.—1st, 2*l.*, S. Saint, Alkmonton; 2nd, 1*l.*, C. Bosworth, Dishley.

Long-woolled ram of any age above a shearing.—1st, 3*l.*, T. Tomlinson, Hall Fields; 2nd, 2*l.*, ditto; 3rd, 1*l.*, Robert Sybray, Snitterton.

Shearing long-woolled ram.—1st, 3*l.*, T. Tomlinson, Hall Fields; 2nd, 2*l.*, ditto; 3rd, 1*l.*, M. Scorer, Scarliffe.

Five long-woolled fat wether sheep, not exceeding 22 months old.—1st, 2*l.*, C. Bosworth, Dishley; 2nd, 1*l.*, ditto.

Best Leicester ram.—1st, 3*l.*, M. Scorer, Scarliffe; 2nd, 2*l.*, T. Johnson, Kirk Ireton.

SHORT-WOOLS.

Five breeding ewes, having had lambs in 1865.—1st, 3*l.*, F. Camp, Etwall; 2nd, 2*l.*, J. Rose, The Ash; 3rd, 1*l.*, F. Camp, Etwall.

Five short-woolled theaves.—1st, 3*l.*, F. Camp, Etwall; 2nd, 2*l.*, John Ironmonger, Atherstone; 3rd, 1*l.*, ditto.

Five short-woolled ewe lambs.—1st, 2*l.*, John Ironmonger, Measham; 2nd, 1*l.*, F. Camp, Etwall.

PIGS.

Boar, of any age, most adapted for general use.—J. Hawksworth, Barton Blount; 2nd, 1*l.*, ditto.

Sow of any age.—1st, 2*l.*, Mrs. Eley, Longford; 2nd, G. J. Mitchell, Newton Solney.

Sow of any age, small breed.—1st, 2*l.*, Dr. Hewgill, Repton.

Pig, the property of an agricultural labourer.—1st, 2*l.*, J. Moorley, Thulston; 2nd, 1*l.*, T. Ling, Markeaton; 3rd, 10*s.*, ditto.

PLAIN SPEAKING AT LUDLOW.

THE CATTLE AND OTHER FARMERS' PLAGUES.

At the dinner of the Ludlow Agricultural Society, on Sept. 15, Mr. Jasper More, who has succeeded Sir Baldwin Leighton as one of the members for South Shropshire, in returning thanks for the County Members, said, "There was a question which had engaged the attention of both France and England, viz., the cattle-plague. Now he was one of those who thought this subject had been very much exaggerated—that there was no ground for the panic which seemed to exist in many counties. On the other hand, he did not regret that the panic existed, because he thought it would educate England in that sanitary knowledge in which she had been especially deficient, and make her pay more attention to those matters of cleanliness and good ventilation of cattle-sheds, in which it was said she had been behindhand. He believed that the alarm was raised solely by Professor Gamgee writing a letter to the *Times* when that journal had a special death of information, in which he said the disease came from Russia, and which he was pleased to call by the German name of "rinderpest," which had nothing to do with Russia. They might perhaps recollect that Professor Simonds was in 1847 sent out for the purpose of investigating the Russian cattle disease and giving us an accurate description of it, and Professor Simonds said that that disease was totally different to the cases which had broken out in this country—that, in fact, there was nothing in common between them. Professor Simonds laid it down that a cow attacked with the Russian plague was always subject to twitching spasms of the mouth, which were totally wanting in the cases which had occurred in this country. But although it was of little moment whether the disease came from Russia or Germany, it was most important it should not be stated there had been cases of cattle plague here unless it were really the case. He had exchanged information on the subject with many practical anatomists, and he felt that there was more alarm than there was occasion for. The cow, it was well known, was more subject to blood disease than any other animal; and there were diseases common to animals all over the world; for instance, distemper in the dog, influenza in the horse, and bronchitis in the pig; and with regard to sheep, the smallpox and many other diseases, which, with the diseases

of the cow, would fill half a veterinary dictionary. He thought, therefore, it was more than probable that many of the cases which had been related in the *Times* were not rinderpest, but simply mere ordinary diseases to which the cow might any day be subject ("Oh, oh!" and marks of dissent). And this view led him to ask whether they thought it desirable to form those associations which were so much recommended on all hands. He found it was proposed that irresponsible bodies of men should collect capital and distribute it as they pleased, without any practical guidance as to the actual nature of the disease (No, no); and he thought it was doubtful whether it was to the interest of farmers to join those associations without careful consideration. About a century ago cattle disease broke out in England, and he should be happy to show them—from *The Gentleman's Magazine*—the almost parallel opinions with those of the present day which were then expressed, both as to the nature of the disease, the country it came from, and the remedies to be applied. And it was a most important fact to notice that the longer it remained in England the milder the form it assumed; while the best remedies were found to be the keeping of the cattle in a strong and healthy condition to resist the attack ("Oh, oh!" and laughter). An eminent man last week told him that the same treatment should be applied to a cow as a physician would apply to a patient in a case of typhus fever, viz., good living to enable the disease to be resisted; that as the contagion was floated here and there, it would be likely to pass over animals which were kept in a good condition and a state of cleanliness. Last week he was in Birmingham, where he met theoretical and practical men, and where he went to the Veterinary College and asked if he should be safe in promulgating the views he entertained with regard to the cattle plague. The answer he got was—"We believe that time will prove you to be right; but if you address your views to any company of farmers in the present state of the public mind, they will all be against you" (Oh, oh). Well, he was not a man afraid of expressing his opinion, whether the company to whom it was addressed agreed with him or whether they did not (applause).

Mr. MATTHEW EVANS was called upon to reply for the unsuccessful exhibitors. After a few remarks pertinent to the

toast, he said: We have had a great deal of talk this evening but a very little bit of business. We have had some extraordinary speeches about the cattle plague, and a good deal of laughing at what Mr. More has said. But I quite agree with Mr. More, that there is a great deal more said about the cattle plague than is necessary. It does not exist in our neighbourhood, and I hope it wont; but, if it should break out, if proper precautions are taken, it will not, I think, be very bad. But there are a great many plagues in this country of which gentlemen at the head of the table on such occasions as these never take any notice. One of those plagues is the game-law: that is a great plague to the farmer—at least it is a great plague to me to see a gentleman's gamekeeper coming over my farm and I cannot have the privilege of giving a friend a day's sport (Hear, hear.) There are many other things which are a great plague to me; and, instead of our talking about the cattle plague all the evening, I think it would have been much better if Mr. More, Capt. Clive, Capt. Sovereign, or anybody else, had told us how they have tried to relieve the farmer by introducing a proper Tenant-right Bill, under which he could get fair compensation for the capital he has expended in improving the land—something that he could fall back upon if he should happen to see the keeper breaking down his fences and treading down his turnips: for it is the keeper and his friends who are the trespassers. But instead of these things we have been going on all the evening about this lugbear of the cattle plague; and Mr. Powell, I think, was quite right when he described us as “nogmen” and “clodpoles,” for when there are big men present you are afraid to speak (“Oh, oh!” applause, and disapprobation). Are not your motives as pure and honest as your landlords? Don't you pay him your rent, and try to improve his land? Is it not fair, then, that you should ask to be put in such a position that, if anything happens to you, your family should receive the benefit of your skill and capital? But you don't say a word about this. You talk about the cattle plague, and the army and navy, and such things as those; but I say let us tell our landlords this—We ought to be fairly reimbursed for the money we lay out in improving your estates (applause). Tell us how that is to be done, and that you won't send your keepers to break down our fences and kick our turnips about in looking after game. It is a disgrace to the country that when you catch a poacher you don't prosecute him at your own expense, and not out of our pockets (Hear, hear). I don't want to hear such twaddle about the cattle plague and other things that don't concern us; but I want you to devise a plan to give tenants proper compensation, and not, when we have expended our capital in improvements, to send a man who is called an agent to raise the rent—

Mr. NEWELL: Name, name.

Mr. EVANS: Well, I will take my own ease as a tenant under Mr. Knight, of Henley. I laid out £600 in improving the land and got no compensation, and then it was let at an increased rent. Mr. Clark is his agent.

Mr. CLARK: I contradict you.

Mr. EVANS: How contradict me! Didn't I pay my rent, and didn't I farm the land better than any other man on the estate? I can give you fifty cases where men have improved their farms and got no compensation; and I mean to say those men were wronged (Hear, hear). At agricultural meetings I want to hear landlords say—Farmers, improve your estates as much as you can, we will never take advantage of you. But did you ever hear gentlemen say that? No; what we hear is a little bit of twaddle and a little bit of humbug (cheers and disapprobation). These associations are for the encouragement of good farming and good husbandry, and the improvement of the condition of the labourer; but we don't hear much about those things. I beg to thank you. Perhaps I have said more than you like, but I could say a great deal more (cheers and disapprobation).

Mr. L. L. CLARK (the agent): I came into this room this evening expecting and hoping to see happy faces—that politics would be ignored—that the progress of agriculture would be considered—and that those relations existing between landlord and tenant, where there was a necessity, would be fairly discussed (Hear, hear); and as my name has been mentioned, perhaps I may be pardoned for saying one or two words in

reference to the subject. I will enter very briefly into Mr. Evans's particular question—[Mr. EVANS: Not a question; mine was an answer]—about which he has thought it necessary to introduce my name. Now, Mr. Evans had formerly a very small holding under Mr. Knight, of Henley, of whose estate I happen to be the agent. [Mr. EVANS: It was 40 acres, at £100 a year.] Mr. Evans has told you he spent £500 upon it. [Mr. EVANS: I spent £700.] Well, I don't know what the amount may be, but whether £500 or £700 it was a very large sum to expend on a grass farm having only one arable field of five acres on it (Hear, hear). Mr. Evans at the time he took that property was resident in this town, keeping an inn; but subsequently he went to reside at the Craven Arms, where I think he has not found agriculture, connected with innkeeping, has been a very unprosperous proceeding, notwithstanding the game and the gamekeepers of which he complains—whether justly or unjustly it is not for me to ascertain. But when Mr. Evans went to the Craven Arms he became a non-resident here, and I would ask any owner of land whether it is usual to keep as occupier a person who resides nine miles off (Hear, hear). Formerly, as I say, he was resident here, and no doubt the land had all those advantages which arise from high manuring, for I will do him the justice to state that he did his land very well; but having done that, he had no just ground, if he felt that he had not had his improvements justly considered—for these things are constantly arising in every-day life—this, I say, is not an occasion on which a man is to be held up to a public meeting of the two counties of Hereford and Salop. [Mr. EVANS: Was I not asked to name?] We don't come here to discuss private disputes between landlord and tenant (Hear, hear). I don't say whether Mr. Evans is right or wrong; but I say that your time is improperly taken up, and that, looking to the objects for which the association was established, it is beneath this meeting to enter on the consideration of such a subject. If Mr. Evans did spend £700 on a small holding, having only one arable field of five acres, I can only say it was a very large outlay, and that if every gentleman who farms would spend his money in the same proportion we should not have much complaint of small crops. When a gentleman whom I represent is referred to on such a matter, and when my name is called in question, though I wish to say nothing personal to Mr. Evans, I must express my opinion that this is a question which ought not to have been introduced here (applause.)

Mr. EVANS: I was asked by Mr. Newell to name, and I did so. I am not to be put down by you or any other man in the company. I have not only named, but I will prove what I have said.

Sir Charles Boughton, Mr. Boughton Knight, and some others here left the room, and for a time considerable confusion prevailed. The business of the evening, however, was partially resumed, when, according to the *Hereford Times*, a tolerably strong opinion was expressed as to “the attempt made during the evening to hunt down Mr. Jasper More, who had been returned to Parliament by the tenant farmers of South Shropshire against the influence of the Tory landlords.”

THE USE OF TAR-WATER IN THE CATTLE DISEASE.—The murrain which has lately raged in many parts of Europe among the horned cattle, and now prevails in some parts of England, should engage our attention to prevent the spreading of so destructive a malady. As this distemper appears by its symptoms to be a kind of fever, it is recommended that tar-water be tried in the following manner: Let the sick beast have poured down its throat a quart of warm tar-water made stronger than usual by stirring each gallon eight or ten minutes, and this to be repeated every hour or two for the first day while the sick beast is awake. On the second day let one-half of the former quantity be given; and on the third day half of that which was given on the second, which last quantity is to be continued till the cure is perfected, during which time the beast should be housed and lie warm.—From “*A Narrative of the Success of Tarwater*,” by Thomas Prior, Esq., 1746.

THE CATTLE PLAGUE.

SIR,—If you think all or any part of this letter respecting the cattle plague, which I forwarded yesterday to the Lords of the Privy Council, fit for your columns, it is at your service.

I am, sir, yours obediently,

EDWARDS CRISP, M.D.

42, Beaufort-street, Chelsea, Sept. 22.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—When the cattle plague first made its appearance in this country, I placed before the Clerk in Waiting various documents, to show that I had for many years been investigating the diseases of the lower animals and of plants, for the purpose of throwing light upon human pathology and treatment, believing that in the study of disease the same system should be pursued as in the study of organized beings—viz., the ascent from the lowest to the highest, a mode of investigation which, I believe, is exclusively my own. Among the publications forwarded were my prize essay* on “Lamb Disease” (awarded by Lord Portman), my essay on the “Causes of Death of the Animals dying at the Regent’s Park Gardens from 1851 to 1862,” my essay on “Splenie Apoplexy in the Ox, Sheep, and Horse” (a disease that kills sooner than the cattle plague), and a numerous list of my papers and morbid specimens of diseases of the lower animals exhibited at the Pathological Society of London. I have, moreover, made the largest collection of the diseases of the lower animals yet formed (many of them in wax). I offered my services to the Government, to investigate the cattle murrain in this or in any other country; and I presume to think, my Lords, that, if my offer had been accepted, I could ere this have placed before the Government and the people such a history of the origin, cause, extension, mode of prevention, &c., of this disease, as would have been of service to the country and to the cause of science.

In answer to my letter to Sir G. Grey, I am informed by Mr. Waddington that the appointment of inspectors is made by the Privy Council. Believing that my long and unrequited labours in the cause of science entitle me to a better and more useful post than that of a cattle inspector, I shall, in proof of this, take the liberty of placing before your lordships, from time to time, certain facts connected with this disease that will, I hope, throw some light upon the subject. The inquiry is one of national importance; and I can, therefore, well afford to incur any charge of presumption and vanity that may be brought against me. I am emboldened to take the course I am about to pursue from the perusal of the very lengthy document by the German professor, Dr. Thudicum, under the direction of the Privy Council—a document that has excited (justly or unjustly) the ridicule of almost every farmer in England.

Let me first place before your Lordships the line of investigation that I have chalked out, in studying this disease; and then, without following the programme, I will in this and other papers touch upon a few points that I consider of immediate and pressing importance.

1. A brief history of epidemic and endemic diseases in man, in the lower animals, and in the vegetable kingdom.

2. The history of the cattle plague in this and in other countries; its variation and abatement, according to season, locality, and the precautionary measures adopted.

3. The origin and cause of the disease in this country, the localities in which it has appeared in the United Kingdom, with statistics of age and sex, the number of animals affected, and the amount of mortality.

4. The symptoms, duration of the disease, and its morbid appearances, especially in relation to the microscopical and chemical condition of the blood.

5. Is the milk or flesh of animals affected with this disease injurious to human beings when taken as food?

* None of these are sold for my own benefit, or I should not have noticed them.

6. What resemblance does the disease bear, in the symptoms and morbid appearances, to the typhus, or typhoid fever, in the human subject?

7. Is the disease now prevailing the rinderpest of Prussia?

8. On the parasitic origin of the disease?

9. The normal visceral anatomy of the ox, sheep, and other ruminants, with a view to ascertain the peculiarities in the structure of the bovine family that especially render them liable to be affected by this mysterious poison.

10. The most practical and efficacious means of prevention, especially as regards the prophylactic treatment by the internal administration of medicine and the distribution of gases through the atmosphere.

11. An estimate of the success attending the various modes of treatment, with suggestions as to the best methods to be pursued.

12. The best and most practical modes of disinfection, and an investigation as to the efficacy of chloride of lime, and other agents as disinfectants.

13. On the importation of foreign cattle as a means of engendering the disease, with practical suggestions for the better regulation of this import in future, and on the necessity of restrictions in the conveyance of cattle by rail.

14. A general summary of the above, with practical conclusions for the guidance of the Government, of agriculturists, cow-keepers, and stock-dealers.

As I said before, my Lords, it is not my intention to trouble you with the series of investigations enumerated above, but rather to place before you, from time to time, such selections from my labours in this field of research as I believe will be practical and useful. A great difficulty presents itself at the onset in the proper investigation of this disease, in consequence of there being no scientific central authority in this country, to which the Government can refer in a eulianity like the present; and the same remark will apply to the medical profession. We have in the one profession* nineteen licensing bodies, all requiring different *curricula* and different examinations; and in the other a college granting a degree, but one which is not compulsory; so that nine-tenths of the veterinary practitioners of this country have had no proper education or examination! Again: let us look to agriculture, where, instead of an agricultural university and museum (the establishment of which I have long publicly advocated), where a good education might be obtained, degrees granted, and professors paid by the State, some of whom might be consulted in such an emergency as the present, we have another club (of which I am a member) in the shape of the Royal Agricultural Society, who eke out education by dribbles at their model establishment at Cirencester. My Lords, all is elubia in this country, and there is nothing national or universal about any one of our scientific institutions. But let me suppose, my Lords, for the sake of exemplification, that when this “cattle plague” first made its appearance we had had in this country a representative Faculty of Medicine in England, Ireland, and Scotland; a veterinary college in each of the three kingdoms, the examination at which all who (as in France) act as veterinarians would be compelled to pass; and an agricultural university, in which the study of the lower animals would form an important item in the *curriculum*; and that selected from these faculties or colleges a commission had been formed to investigate this disease and to report upon it; is it likely, my Lords, that many important matters would be in the same state of doubt and uncertainty as at present? Let me explain. In the lengthy document by Dr. Thudicum (approved of by the Privy Council), constant reference is made to the use of chloride of lime: “A healthy animal is to be washed with chloride of lime, with tepid water; then fodder, both dry and green, is to be given; then sop and pure cold water; and next, the animal is to be rubbed dry with whisks of straw and hay.” My Lords, there is no proof whatever that chloride of lime will prevent the noxious effects of this

* See my evidence before the Parliamentary Committee on the Pharmacy Bill Blue Book.

poison when received by the lungs, its ordinary and perhaps sole mode of access; but assuming that the poison may be introduced by the skin, I can conceive no method so likely as this washing, wetting, and rubbing, to effect the introduction of the poison; and as to "pure water," everybody connected with cattle knows that these animals give the preference to, and do better upon, the water of ponds and ditches, which is so impure that it would be considered unfit for human beings. The occurrence of this disease is not a question of *health*. A diseased animal would probably be more likely to escape the malady which the strongest and healthiest readily succumb to. As I shall have occasion to allude to this curious document hereafter, I will for the present confine myself to the chloride of lime question, viz., Has this substance the disinfecting influence imputed to it? How are we to determine this? My Lords, if the imaginary commission I have spoken of had been formed, a large sanitarium or hospital would have been established in an open space near London, where experiments might have been made to determine this and fifty other matters that are now in doubt and uncertainty. Experiments to be useful must be performed on a large scale: few and isolated experiments only lead to false inferences. To such an establishment formed by the Government, diseased animals, in closed vehicles constructed for the purpose, might have been taken; cows and oxen of little value might have been surrounded with chloride of lime, and introduced among the diseased animals; others that had had their systems saturated with sulphur, tar, salt, and many other substances, might have been similarly tested; and medical and other modes of treatment might have been tried, and in this way, as I believe, a vast number of important facts would have been elicited. On the score of cruelty some would object to these experiments; but they (the experiments) would be "cruel kind," as the Irish say, as the sacrifice of the lives of a few cattle might be the means of saving a large num-

ber, and the extension of the malady by such a method as I advocate would not, I believe, be likely to occur.

In my next letter, my Lords, I hope to speak of the prophylactic treatment, viz., Can we by any method of internal or external medication so affect the blood of a bovine animal as to render it insusceptible of the noxious influence of this mysterious poison?

Before concluding this, my first letter, let me, my Lords, urge upon you the necessity of *at once* placing restrictions upon the conveyance of living cattle by railroads: it is by this means that the disease has been quietly disseminated and conveyed to almost every part of England; and I think that the transport of all living cows, bulls, oxen, and calves should be at once prevented, and all large gatherings of cattle at fairs and agricultural shows prohibited.

Dead-meat markets should be established in various parts of London, and in all our large cities and towns; and the flesh only of oxen, cows, and calves should be admitted, when properly dressed, and inspected by competent persons. I am aware that such a prohibition would excite a great deal of opposition and discontent in certain quarters; but the necessity of taking stringent and active measures for preventing the spread of this disease is so urgent, that all should be willing to make sacrifices for the general good. All foreign cattle (like our homebred beasts), for the present, should be slaughtered out of London, and the flesh sent to the dead-meat market, after proper inspection; and so at all our seaports where foreign oxen are landed.

I have the honour to be, my Lord,

Yours respectfully,

EDWARDS CRISP, M.D.,
late Physician to the Metropolitan Dispensary.

42, Beaufort-street, Chelsea, Sept. 21.

MISS BURDETT COUTTS ON THE CATTLE DISEASE.

This lady has written the following on the ravages of the cattle disease:—

"Holly Lodge, Highgate, Sept. 8.

"Herewith I enclose my bailiff's report of the cattle plague which has visited my dairy. I should have sent it earlier, but that my bailiff and herdsman went to the seaside for a few days, and that I have also been myself extremely occupied with the various orders necessary to be given to avoid perpetuating the disease.

"In the presence of so alarming a visitation one feels an amount of individual responsibility for all one does or leaves undone. I therefore do not scruple to lay before you the reasons which induce me to adhere to the opinion that the disease is the Russian murrain, brought in by imported cattle.

"The conclusion as to the source of the disease, come to by a perfectly impartial person, who has been face to face with the disease, may not be without use, and it is needless for me to say that it is a matter of perfect indifference to me which of the three theories put forward may ultimately prove to be correct—

"1. The state of the cowsheds of London.

"2. The state in which imported cattle are allowed to come into our market.

"3. The Russian murrain.

"Of the two first, allow me to say that it appears to me a disgrace to our legislation, and wholly at variance with our professed civilization, not to say religion, that it should be possible even to advert to these as the most probable sources of this disease. But whatever other diseases these sources may by a retributive justice give rise to among us, I cannot myself look upon them as those of the present plague. Possibly a peculiar condition of the atmosphere may call into sudden action evil which has long lain dormant, and the cowsheds, cattle vessels, and railway trucks may, on this supposition, be connected with this outbreak of the evil; but it strikes me as singular that this evil should take the precise form of the rinderpest, when we consider that all the conditions of life and climate in England and the Steppes of Russia are so wholly different. With the exception of the outbreak of 1746,

England has not suffered from this disease, so well known in northern Europe. But I understand that, until lately, we have not imported cattle from Russia, and our immunity has been doubtless due to the precautions taken in Germany to prevent its ravages in that country. This year cattle have been imported direct from Russia, and I have been informed that about three months since an inquiry was made at the Islington Market 'as to whether there were any restrictions upon Russian cattle.' The question implied a suspicion that such instructions should exist, and suggested the reason for them. It is surely a singular coincidence that the sources of disease, always existing amongst us, should cease to lay dormant, and burst forth into Russian murrain simultaneously with an importation of cattle from that country, and should exist with the greatest virulence in the very market to which it is generally supposed the largest portion of the herd was sent. I am aware that it has been reported that Hull, where the animals were landed, has not been visited by the disease, and that it cannot be traced with certainty into the London market from the sale of this herd. But as it is also asserted that there are no means whereby English and foreign cattle can be distinguished in the market, I do not see how the absence of the animals can be affirmed with any certainty. The one fact remains uncontradicted, that a cargo came from Russia, and is dispersed somewhere about the country. I do not, however, form my opinion as to the origin of our present distress upon this fact solely, but I also find in Dr. Budd's report upon the rinderpest an explanation of many of the peculiar phenomena it has exhibited, and for which we seek to account. I did not read, as I should not have understood, the purely medical portion of Dr. Budd's report; but I believe that though the symptoms of the disease in England may have been modified by climate, water, food, and other influences, yet its course during its progress and at its close in death corresponds to the course of the disease as described in Dr. Budd's report. His account of the rinderpest is the more significant and valuable from the circumstance that it was written without reference to the existence in England of the disease now prevalent among our cattle, and that the similarity between the two diseases

has not ever been, to my knowledge, denied. I therefore assume this to be the case, and I cannot but think Dr. Budd's observations offer a clue to much that perplexes us in the manifestation of this complaint. He states that those animals suffer most from the rinderpest who have never had it in their race; for instance, the young of animals who have gone through the disease take it more mildly and transmit the tendency to its influence in a modified form. He also observes that no animal takes it twice. In these two points it bears an analogy to diseases common among us, such as small-pox; and, as in these diseases there are exceptions found to rules otherwise general, so similar exceptions might possibly be found in the rinderpest; still the rule remains. Another important piece of information to be found in the report is this, that while sheep, dogs, and other animals are impervious to the disease, they can convey its poison. Now it seems to me that these observations would account for the phenomena we have observed.—

"1. The sudden breaking out of the disease in various parts of the country and under very different conditions.

"2. The immunity of the animals of one shed and the virulence with which it attacks those of an adjoining shed.

"3. The severity with which it has usually attacked English bred cattle.

"We could thus account for the circumstances observed in Hull. Of the 300 beasts landed, there is no reason to suppose that all were sick, and the healthy may have remained at Hull or in that neighbourhood, or all may have been sent away, the sick to carry pestilence, while of the healthy no trace would be found. The infected cattle might herd with home-bred cattle peculiarly liable to take the disease, or with imported cattle less likely to take it for the reasons assigned by Dr. Budd; and possibly some of our own herds of home-bred cattle might take it less severely from its having been in their race, for we should bear in mind that we have had the disease in England in 1745, and that it then lasted 14 years, notwithstanding the strongest measures taken by the King in Council to prevent it. Of course it would require long and patient investigation and observations to prove or disprove these suggestions. The same train of reasoning would also apply to the Dutch cattle imported from Holland, which have suffered cruelly. Most of them would be, like our home-bred cattle, peculiarly liable to complaint. Holland is usually guarded, like ourselves, from its inroads by the precautions of Germany for its own safety. We know, however, that in 1857 the disease penetrated into Prussia. I do not know how far it was checked by the strict cordon kept to exclude it, or how far its influence extended; but during a time of war such cordons are not easily maintained, and some animals conveying the plague may have come to our shores either through Prussia or Holland, where the cattle have been said to be sickly for some cause or other for some time past.

"My own conviction, that we have the rinderpest among us, is so decided that I venture earnestly to press upon your attention the urgent necessity for a systematic attempt to discover an effectual mode of treatment. We cannot altogether prevent importation, and when this panic has died out people will again become careless; and though I heartily hope that the system of bringing the poor creatures to market may be humanized, and the state of our cattle-sheds permanently amended, still efficient inspection can never be relied on except under the pressure of danger; and the signs of the disease are so peculiarly subtle as to elude even careful and self-interested watching.

"I might have sold innocently the day before its seizure the worst case. I had in my dairy a cow with a calf I was particularly anxious to save, and which had remained apparently healthy throughout the previous fortnight, while the disease was at its height among the other cattle. Would it be impossible for the Government to select a certain number of chemists' shops, as depôts, in different parts of the town (such as Savory and Moore, in Bond-street), where information as to the signs, especially the early signs, of the disease could be procured, together with certain information as to the medicines and modes of treatment which had been found curative, or even which mitigated the form of the disease? It would be important to alleviate the sufferings the animals endure, and to render their bodies less dangerous when dead. I am about to set some inquiry on foot myself on these points. A few gentlemen kindly give me their help. May I hope for any assistance from Government in carrying out my project? There

are several other very grave subjects on which information is greatly needed. Is the meat of diseased animals fit food for man or for animals in any stage of the disorder? I have heard of sickness lately in kennels. Can this be attributed to the meat given to the dogs? The milk also, is it fit for use, either during the attack or immediately after it? Some of my cows gave milk after doses of bisulphate of soda. I did not allow it to be used, but it could scarcely be expected that others should do this whose livelihood depended on their supply of milk; and, if unnecessary to be done, the waste would be equally to be deplored.

"On the recovery of the only cow saved out of my herd of 20, the milk was given to some pigs. They rejected it at first, and, after taking it, sickened slightly. I forbade its use for a week. Surely it is a point of great importance to the public health, and should be ascertained, and inspectors should have the power of certifying that an animal is or is not in a fit state to be milked.

"At present no one knows where to turn for any advice, and it seems to me, and I believe I may add that I represent the opinions of many, that upon such an occasion as the present our Government should take the lead in guiding us how to act, and in assisting us to meet an emergency which is full of difficulty and danger to all classes. According to the account of the murrain drawn up in 1745, the spring months proved the most severe, while it slumbered in winter. We must not, therefore, reckon upon its ceasing with the year; nor should we forget that we have not the cold which in Russia, I presume, checks the infection, and the absence of which accounts for the still greater severity with which it is said that the disease has visited Egypt, which is afflicted with this as well as with cholera."

RULES FOR ROAD LOCOMOTIVES.

2. One of such persons when locomotive in motion to precede it on foot by not less than sixty yards, and to carry red flag constantly displayed to warn riders and drivers of approach of locomotive, to signal the driver thereof when it shall be necessary to stop, and to assist horses, &c., passing.

3. Drivers to give as much space as possible for other traffic.

4. Whistle not to be sounded for any purpose.

Cylinder taps not to be opened in sight of person riding, driving, leading, or in charge of a horse upon the road.

Steam not to be allowed to attain a pressure exceeding limit fixed by safety-valve, so that no steam shall blow off when locomotive on road.

5. Locomotive to be instantly stopped when required by person preceding same, or any person with horse or carriage putting up his hand as a signal.

6. Person in charge to provide two efficient lights, to be affixed conspicuously, one at each side, on the front of the same, between the hours of one hour after sunset and one hour before sunrise.

Penalty on owner for non-compliance with all or any of the above not exceeding £10; but the owner may recover the penalty of the person in charge of, or in attendance upon locomotive, on proof that the same was incurred by reason of his negligence or wilful default.

Waggons, &c., drawn by locomotive, and loaded with materials now exempt from toll, to be exempt as if drawn by animal power.

N.B.—Thrashing machines, and the steam engine for working a thrashing machine, are exempt from toll.

Locomotive not to be driven along turnpike-road or public highway at greater speed than four miles an hour, or subject to the regulations which may be made by local authorities, through any city, town, or village at greater speed than two miles an hour.

Penalty not exceeding £10.

The weight of locomotive, and the name and residence of owner or owners to be affixed thereto in conspicuous manner.

Penalty as to weight, not exceeding £5

Other particulars, not exceeding 2

For fraudulently affixing incorrect weight, not

exceeding 10

Nothing in acts contained is to authorize any person to use locomotive so constructed or used as to be a public nuisance at common law, nor to affect right of any person to recover damage in respect of injury sustained in consequence of use of locomotive.—*Road Locomotives, by T. Aveling.*

THE TENANT FARMERS OF ENGLAND.

BY A PRACTICAL FARMER.

From time immemorial it has been asserted, and it has hitherto been taken as a fact, that the interests of the landlord and the tenant farmer are identical; and therefore all the tenant had to do, or expected to look for, was the protection, the support, and guidance of the landlord, and most assuredly so in matters political, and to such an extent that his wishes and opinions were never consulted. All he had to do was to vote for his landlord at the county election, and woe betide him if he failed to do so. Now this might be politic and reasonable in the "good old days" of feudalism and clanship, when the farmer was more the retainer than the tenant, and yielded his lord liege service for the measure of protection and safety he enjoyed under him; or, to come nearer to our own days, when, as it was still said, "the farmers were as dull as the clods they cultivated," and when they were disposed to yield themselves to a kind of voluntary serfdom, boasting of their long lines of ancestry under this noble Duke or that noble Lord—all right enough in its place, but the occupiers could not break away from their feeling of serf-like dependence, and assert a manly independence of character and conduct. Well, it might be all very well in those days for aristocratic family influence to hold a kind of despotic sway, and thus carry county elections, and assume other great powers; but these days have passed away before "the march of mind." "The school-master has been long abroad:" knowledge has been universally diffused, and that of every kind. We have a cheap literature; our press teems with papers and periodicals; our country is filled with associations for the improvement and advancement of every class of the community. In agriculture such associations abound everywhere, and agricultural advancement has become the wonder of the times. Yes, poor despised agriculture has taken a position in the world's progress second to none. It is taught in our colleges, it is practised in our laboratories; engineering skill and mechanical science have achieved wonders for it: but the fulcrum upon which the lever rests that moves the whole is the tenant farmer. His acquirements and growing intelligence, his skill and enterprise, his judicious tact and management effect the whole. All this is more than acknowledged by landlords. We have heard noble Dukes and noble Lords address their tenants individually as private friends, and, what is better, seen them treat them as such. This is in a great measure attributable to the abounding agricultural societies, which have broken down those haughty barriers in every district by which high-born families were held aloof from their tenantry. They are now fain to acknowledge the tenant farmers of England as an intelligent and increasingly independent body. It is to this general acknowledgment of their knowledge and importance as a class by the aristocracy of the kingdom that I wish to draw attention, as a proof of the desirable position to which the present tenant farmers of England have attained. Undoubtedly they have attained a high and most important position in the general economy of British interests and British industry. They have established themselves as a class. They have attained it by their own energy and acquisitions of knowledge; they will continually thus improve their position, and they will uphold it by their indefatigable perseverance and the extent to which they will benefit the state by a vastly improved and developed agriculture. The tenant farmers of England are now a

most important class, and as a class they must look after their own interests. Landlords have no power to aid them; their power generally and the identity of interests no longer stand so paramount as they did. The landlord is, and will ere long be more and more beholden to a skilled and enterprising tenant. Just let us refer for a moment to this identity of interests. First, the game laws—of what value are they to tenant farmers? He has to feed game for the landlord, and for which he must make ample provision. In many cases he must sow a crop expressly for them; in others he may mow his grain crop, but he is debarred from raking up the dropped stems. Again, he must not mow at all—stubbles are good cover for game. Again, his fields are planted with thorn bushes to prevent netting, there to remain. Of what use are our scientific improvements to him? What of autumn culture, the best of all improvements? He cannot break up his land immediately after harvest. Of what use is steam cultivation to him, or skeleton ploughing or broadsharing? Then he must not touch the game: "no-trespassing" gamekeepers and informers see to that. Fie upon the game laws! they are a curse to agriculture. Then there is the malt-tax. Most farmers say it is a grievous burthen to them—a tax upon the barley grower. Landlords don't trouble themselves much about its removal. Again, there is the tithe, a very heavy burthen, and one laid upon land with much propriety when land was the basis of wealth and the population thin, poor, and scattered; but landlords never trouble themselves to divide this burthen upon the basis of population, instead of upon land only. Land has now no more right to exclusively support the Church Establishment, than to support the whole order of Government. Population, and not land, should now be its basis of support. Then there are many minor matters which landlords care but little about. There is the question of agricultural statistics—a question which is very interesting to the tenant farmer, and, if carried, would prevent him doing his business in ignorance of supplies to any extent. The landlord's dogs may worry his tenant's sheep without redress, or, at least, a tardy one. The parochial roads may be covered with grass up to his saddle girths, but his tenant's stock must not take a mouthful. All parochial offices fall to the tenant, or nearly so—some of them troublesome enough, the tenant doing the work, the landlord retaining the direction. I would be the last to impugn landlords as a class; but, if they don't look closer after the tenant's interests, his rights and privileges, he will soon turn politician, and endeavour to right himself. I rejoice to see most unequivocal tokens of this movement during the past election of the House of Commons. The tenant farmers of England are quite certain that inexperienced young lordlings (Lord Dundrearys), or unbusiness-like young squires, are no representatives for them, and they are beginning to select men of their own order. Yes, and they will too. What is to prevent them? Landlords may threaten, they may punish, they may change tenants, and that often, the oftener the better to bring the question to a settlement; but it will be all one in the long run. And why? It is this: there cannot be a doubt as to the class of men who now guide or rule the British nation. It is the intelligence of the middle classes. It is their knowledge, their energy, their requirements, and their enterprise that keep the wheels of Government in safe

progress. And is it to be supposed that the rapid increase of knowledge and importance, so lately attained by the tenant-farmers, will remain without its influence? Depend upon it, they will soon be fully aroused to their own interests. They will soon be heard in the Senate, and they ought to be heard. I hail the first movement of this order. The county of Norfolk has once more taken the initiative. It was the first to commence a new era in British agriculture. It is one of the first to send a genuine tenant-farmer to the House of Commons. I hail the return of Mr. Clare Sewell Read as a great triumph of the tenant-farmers of East Norfolk. He is a good type of the intelligent tenant-farmer, and is a man well known to the agricultural body. He is an excellent man of business. He is a first-class judge at our agricultural meetings. He is a clear and comprehensive writer on agricultural subjects, and he is a ready and pithy speaker. He has long been before the agricultural public, and has proved himself a sterling man. One fact I will name to his honour. While agent of a noble Earl, he was urged to enhance the rental of the estate; but feeling assured that it would be inequitable to the tenantry, he chose to resign his agency rather than do so. It is not every one that would act so nobly. He owes his elevation mainly to his consistent advocacy of the tenant-farmers'

interests. Nor is the county of Cambridge far behind; indeed it takes precedence, having elected Mr. Ball, a tenant-farmer, as a protectionist, when the battle of free-trade was fought. Now, the tenant-farmers of Cambridgeshire have ousted a young squire, and replaced him by an excellent man of business in Mr. Young, who, although not precisely a tenant-farmer, has all his days been brought up amongst them, and is one with them in heart and mind. Mr. Hope, of Penton Barns, was also put forward, as a tenant-farmer, for a Scotch constituency. These, and instances like these, show and foretell a political power which will ere long be wielded by the tenant-farmers of England. They will elect representatives of their own, in considerable numbers, so as to make a stand in the Commons House of Parliament for their own benefit and rights. They will no longer be "tools," but independent men who can and will think and act for themselves. We live in an age when mind predominates over wealth and power, and takes its proper and beneficial influence. The agricultural mind, which has so long been grovelling under the pressure of prejudice and custom, not to say ignorance, is now becoming fully developed, and must take its place in the foremost rank of intelligence and worth; agriculture itself, a nation's soundest trust, becoming one of the highest applications of science and skill.

THE ERVUM—A NEW FODDER PLANT.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRACTIQUE."]

Acclimatization of a new fodder plant, the K'rsa' Allah', or Ervum, which may be cultivated upon the most arid soils, and in spite of the most prolonged droughts.

During one of my journeys through Algeria, in August and September, 1859, where I was sent for the purpose of studying the silkworm, the cochineal, and other subjects in agricultural zoology—at a time when everything was burnt up by a drought of several months, when the bullocks and horses were suffering from a great scarcity—I was shown a small leguminous plant, the seed of which was given to the cattle, enabling them to exist until the season when fresh grass should have grown. Having questioned the Arabs upon the subject, I learned that this plant was regarded as specially sent by Providence: without it, the cattle would die of hunger during the long droughts. They told me that they gave the seed both to horses and cattle, first crushing it a little, and assured me that it afforded double the nourishment obtained from barley, but that its price of the latter was proportionately less, since they paid from 24 to 25 francs the 100 kilog., when barley was at 20 francs. They added that the plant would grow in the most barren soils, sprout and fructify in spite of the most prolonged droughts, and that it was called by the Arabs K'rsa' Allah', because they believed it was given by God himself.

The information I received having awakened in me a lively interest, I began to think that a fodder plant which could brave long drought might be usefully cultivated in Europe, particularly in our meridional departments, such as Italy, Spain, Portugal, Greece, Turkey, &c., where droughts are very frequent. I then procured some seed, determining to try the experiment of acclimatizing it, and afterwards extending the culture of it to localities where it might render services similar to those in Africa.

My first trial was in the environs of Paris, and near Toulon. It was not altogether successful: but still I was enabled to preserve the species, and habituate it to our climate. It was not, however, till the time when the Emperor graciously conceded to me a portion of land upon his imperial farm at Vincennes, for the purpose of experimenting, that I was able to obtain each year better results. There, on a meagre, calcareous soil, upon an arid upland, and without using any manure, I succeeded in acclimatizing the Ervum, which yielded me every year increased produce. Now, after six years' trial

and complete success, I invite agriculturists who live in meagre, arid localities, to try the culture of the K'rsa' Allah'; that by that means they may be able to judge whether it is likely to render them services equal to those it gives to the Arabs.

If, as I hope, this leguminous plant takes a place in the agriculture of some localities in France, or elsewhere, it may perhaps be improved, so as to render the growth taller. It is even possible that if cultivated in good soils it may be made to yield as much, and even more, than oats. As soon as I found my acclimatization experiments begin to promise me the acquisition of the K'rsa' Allah', I wished to know to what species it belonged; and with a view to obtaining the necessary information, I sent a stalk to M. de Candolle, who informed me that it was the *Ervum ervilia* of Linneus—variety *angustifolia*. It is a species suitable to Mediterranean regions, and holds its place near the lentil (*Ervum lens*). This year my crop—obtained from a surface of 160 square metres—is not yet thrashed; but it is very abundant, as the plants I had the honour of exhibiting before the committee of the Central Society of Agriculture showed. There are numbers of pods, filled with grain, upon each stalk; in fact, they are almost as numerous as the leaves upon the greater part of the plant.

I shall continue the culture of this plant under the same conditions, and think that others would be willing to make experiments with the species; I therefore offer, first to my fellow-members, the seed harvested at the commencement of this month (Aug. 6th), proceeding from seed sown on the 7th of May; and shall be glad also to place it at the disposal of any agriculturists who may wish to try its culture.

Should this acclimatization prove useful—if the K'rsa' Allah' or ervilia from the imperial farm of Vincennes spreads itself in dry and arid lands, rendering the same services that it does in Africa, my desires will be accomplished, for I shall have added one more proof of the benefit the imperial farms are to agriculture, by enabling seekers to try experiments when they could not otherwise obtain the means.

F. E. GUERIN MENESVILLE,
Member of the Imperial and Central Society
of Agriculture of France.

PROFESSOR ANDERSON'S LECTURE.

"THE CHEMISTRY OF WOOL, AND ITS MANAGEMENT."

After the dinner of the committee and judges, at the Highland and Agricultural Society, at Inverness, Professor Anderson delivered a lecture on the "Chemistry of Wool, and its Management." There was a large attendance.

Professor ANDERSON said: In addressing you on the present occasion in the centre of a district in which arable farming scarcely occupies that position of preponderating importance which it does in most places, I have endeavoured to select for your consideration a subject bearing more immediately on its staple produce; and the choice has not been unattended with difficulty, for the agricultural questions with which chemistry has been chiefly occupied are exactly those which bear most directly on the operations of tillage, and least so on those of the sheep farmer. The composition of the soil, and the manures to be applied to it, of the crops it yields, and the feeding stuffs which can be most advantageously employed for the fattening of stock, are the subjects which have come most prominently under the notice of the chemist; and though they necessarily embrace many matters which must greatly interest the sheep farmer, in common with everyone connected in any way with the practice of agriculture, they do so to a less extent than others bearing more directly on this particular subject. The great majority of the questions which are of most importance to him are of a kind on which chemistry is incapable of throwing light, and with which, indeed, it has no connection of any kind. Even here, however, there are matters on which a knowledge of some chemical facts is not unimportant, and among these I have chosen the chemistry of wool and its management as one likely to possess some interest on the present occasion; and though I may possibly touch upon matters which may at first sight appear to have no very direct application to practice, I am satisfied that further consideration will show that they are far from unimportant. For it cannot be doubted that those who feel an intelligent interest in their profession will seek to know everything connected with it, being well assured that there is no fact which may not at some time or other come to possess a direct practical bearing on it. The subject I have selected for consideration, taken in its broadest aspect, is one of great extent, and might, in fact, be made to include the entire management of the sheep; for the production of a good crop of wool of the highest quality involves the nicest attention to the breed of the animal and its perfect health. But these, and especially the former, are matters which do not come within the province of chemistry, and cannot, therefore, be discussed here. Neither is it always possible to explain by analysis the cause of the difference in quality of different kinds of wool, the commercial value of which is due not so much to its composition as to its structure. We shall see presently that there are often differences in the composition of the various kinds of wool, but on the other hand two samples may be chemically undistinguishable from one another, although the experienced wool stapler will set down one as of the highest, and the other of the lowest quality. Even the wool of a single fleece is separated by the manufacturer into many qualities fitted for different purposes, and bearing very different values. The cause of this is rendered obvious when the wool is examined by the microscope, when it is seen that its quality depends partly on the fineness and uniformity of the fibre, and partly on the length of the staple, which fits it for the manufacture of particular fabrics. It is well known that these qualities are greatly affected by the breed and the climate in which the sheep has lived, and it is by attention to the former that the character of Scotch wool has been so much raised; while the latter is a difficulty with which our sheep farmers will always have to contend, and which must prevent our wool in general from bringing as high a price as that produced in more favoured localities. The nature of the food supplied to the sheep has, no doubt, a material influence on the quality of the wool, and is a subject which well merits attention. But I do not propose to enter upon the consideration of this question on the present occa-

sion, and that principally because the information regarding it is of the most scanty description; and I have failed to discover any experiments on the influence of the food on the weight or quality of the fleece. We know generally that the best wool is obtained from animals fed on the richest pastures, but it is not possible to tell how far the superiority is due to the more nutritious character of the grasses, or merely to the more favourable climate. The composition and nutritive value of the cultivated and natural grasses of lowland districts are well known, but there is absolutely no information regarding those which form the bulk of mountain pastures. Many of the species are no doubt the same as those found in the lower districts, and their composition is probably very similar, though others are different, and of their composition we are entirely ignorant. There would, of course, be no difficulty in making analyses of these; but the information they would convey would be of little use, unless it were coupled with a knowledge of those which the sheep select and avoid. It is probable, indeed, that the higher or lower value of mountain pastures depend not so much on the difference in the nutritive value of the grasses of which they are composed, as in the greater or less abundance of those which are most palatable to the stock—for sheep prefer the finer grasses, and are only compelled by hunger to consume the coarser species, although they are often just as nutritive as those they select. The influence of an abundant supply of food on the quantity at least of the wool is sufficiently obvious, but it becomes still more striking when we consider what that quantity is, and how active must be the animal functions by which it is produced. To do this, it is necessary to look at the relative weights of the fleece, and the animal which produces it. These vary greatly with the breed, as may be seen from the table here given, which contains those which are most widely distributed in this country:—

	LONGWOOLLED.	
Lincolnshire		8 to 10 lbs.
Devon		9
Leicester		7
Blackfaced		3
	INTERMEDIATE.	
Dorset		6
Cheviot		5
	SHORTWOOLLED.	
Merino		6 to 8
Shropshire Down		7
Southdown		3 to 4

Taking all the breeds together, the average weight of a fleece may be set down at 6 lbs., while that of the sheep in the unfattened condition will not exceed 90 or 100 lbs. It thus appears that a sheep produces every year a quantity of wool equal to about a sixteenth of its own weight. Even this, however, does not give a perfect idea of the matter, which can only be obtained by making the comparison between the dry wool and the dry matter of the sheep. Wool in its natural state contains about 16 per cent. of water, and if an allowance be made for dirt adhering to it, the weight of actual wool in each fleece is about 5 lbs. But the entire body of the sheep contains about two-thirds of its weight of water, so that if dried up (exclusive of wool) it would weigh only 30 lbs.; and hence it follows that a sheep produces annually, in the shape of dry wool, a quantity of matter equal to about one-sixth of the solid substances contained in its body. These facts are sufficient to show the importance of an abundant supply of nutritive food to support the drain in the system occasioned by the growth of this large quantity of animal matter. When we further consider the delicate organisation of the skin, each hair of the wool growing within a little tube of its own, furnished with minute glands, by which it is furnished with a peculiar oily secretion necessary to promote its growth and keep it in a soft and pliant condition, and others by which the

perspiration is evolved, and that the growth of the wool depends upon all this complex machinery performing its functions in a perfectly healthy manner, the importance of an exact knowledge of all the conditions affecting them will be sufficiently obvious. Without venturing to discuss the physiological questions connected with the functions of the skin, I proceed to remark that the chemical composition of the wool is extremely complex. As removed from the animal, it consists of two parts—the wool proper, that is, the fibre which is used by the manufacturer; and the “yolk,” a peculiar substance secreted by the glands of the skin, by which the fibre is moistened and protected. In the process of scouring the wool, which is the first step in its manufacture, the greater part of the yolk is removed by means of water and other agents, the action of which will be afterwards explained, and the fibre obtained in a more or less pure state. By careful treatment, the scientific chemist removes them entirely, and then obtains the pure fibre, which then differs but little from the hair of other animals. We shall consider separately the nature of each of these. The pure wool is of itself a very complex substance. It contains a small quantity of fixed or mineral matters, which are left behind in the ash when it is burnt, and this contains a comparatively large quantity of silica, a substance found in extremely limited quantity in the animal body. Setting aside these substances, the wool consists of—

Carbon	50.65
Hydrogen	7.02
Nitrogen	17.71
Sulphur	2.31
Oxygen	22.31
	100.00

In composition, therefore, it does not materially differ from the nitrogenous constituents of other parts of the animal body. It is as rich in nitrogen as the gelatine of the bones, and surpasses every other animal substance in the proportion of sulphur it contains. The state in which this sulphur exists in it is peculiar. A very distinguished French chemist, M. Chevreul, supposed that it might be removed from it without injuring the quality of the fibre; but more recent experiments have disproved this view. But they show that a portion can be easily extracted, although the remainder resists all agents, except those which completely destroy the fibre. So feebly is part of the sulphur retained, that it is actually expelled when the wool is boiled with water, and even slowly escapes at ordinary temperatures; and this is the reason why metallic, especially silver, articles become black on the surface when left for a long time in contact with it. A portion of the sulphur can be easily removed by alkalis, but a part resists their action, and from this difference in the condition in which it is present it is not improbable that the fibre of wool is composed of two different compounds, but chemists have not yet succeeded in devising a method by which they can be separated. This opinion derives support from the fact that the quantity of sulphur varies in different samples of wool, and appears to depend in some way on its quality. It has been found to vary from 3.4 per cent. down to 1.89, and one observer has even found as little as 0.89, although this result appears to be doubtful. The largest proportion (3.4 per cent.) was found in the wool of a particular breed which feeds on moorlands in Germany, and which is extremely coarse and inferior in quality, while the lowest was found a particularly fine wool. The quantity in ordinary wools is about 2.5 per cent., and from that to 2 per cent. was found in several samples of English wool, though the experimenter unfortunately omits to specify the breeds. The “yolk” as it is called, which is mixed with the wool proper in the fleece, is still more complicated in its composition, and is a mixture of a variety of substances secreted by the oil and sweat glands of the skin. The proportion found in the fleece varies very greatly, sometimes amounting to nearly half the entire weight of the fleece, though in general it does not exceed 25 per cent. In one instance examined by Chevreul the wool contained only 31 per cent. of pure fibre, but the loss in this case included 26 per cent. of earthy matter adhering to the fleece; but even including dirt, the quantity rarely exceeds half the weight. It appears that the yolk is largest in the finer varieties of wool, but upon this point there appears to be considerable room for further inquiry. The chemical nature of the yolk was first examined in the end

of the last century by Vanquelin. Before his time it had usually been considered to be of a fatty nature, but he showed that it was principally composed of a soap containing potash as its base, some carbonate of potash, small quantities of some other salts of potash, and an animal matter. More recently Chevreul examined the yolk, and found it to contain, in addition to these substances, two peculiar substances of a fatty nature, but differing from ordinary fats in being incapable of forming soaps with the alkalis, but which have not been more particularly studied since his time. When wool is immersed in water, a portion of the yolk, consisting of the matters exuded by the glands, rapidly dissolves, and the matter so taken up is rich in potash, and has to some extent the qualities of soap. As this accumulates in the water it acquires a powerful detergent property, and causes the fatty matters of the wool, which are themselves insoluble in water, to enter into solution. In this way Chevreul found that 32 per cent. of the wool entered into solution, but it retained $8\frac{1}{2}$ per cent. of fat, which could only be extracted from it by spirits of wine or by alkalis. These substances are removed from the wool in the process of scouring, first by the use of water, and afterwards by means of an ammoniacal solution. Formerly urine allowed to putrify until ammonia was produced in it was employed for this purpose; but the facility of obtaining the pure alkali has led to its being substituted, and in some cases soap is also used. The nature of the soluble matters of wool has undergone a further examination within the last few years by two Frenchmen, named Mammene and Rogelet, who have founded upon it an interesting branch of manufacture peculiarly worthy of the attention of the farmer, because it gives him some indication of what sheep are receiving from the soil. According to their observations, average wool, when washed with water, yields to it 15 per cent. of its weight of yolk, composed of a particular animal acid in union with potash, of which it contains about 33 per cent. According to this calculation, a fleece weighing 6 lbs. must contain about 5 ounces of potash which are forever removed from the soil and have hitherto been entirely lost. MM. Mammene and Rogelet, however, recover this, and their process is in actual operation in some of the great centres of the woollen manufactures of France, and is in all respects a most interesting and important one. They buy from the woollen manufacturers the yolk obtained in their process of washing, according to a carefully graduated scale, giving for that extracted from a ton of wool about 15s. if it be diffused through 69 gallons of water, and only 4s. 5d. if contained in 600 gallons, and at proportionate rates for intermediate degrees of concentration, the different prices paid for the same article in different degrees of dilution depending on the increased cost of recovering the potash from the more dilute fluids. By this means the manufacturers are induced to adopt a systematic mode of washing the wool so as to use the minimum amount of water. These fluids are then evaporated to dryness, and the residue introduced into iron retorts, where it is calcined, gas (which can be used for illuminating purposes) and ammonia being driven off, and the potash left behind in the form of carbonate. The quantity of potash which might be thus recovered from the wool is very large. MM. Mammene and Rogelet state that there are 47,000,000 sheep in France, and from their wool, if it were all carefully washed, there would be obtained annually 11,700 tons of carbonate of potash, worth about £350,000, which is sufficient to supply the entire demand for that substance in that country. In Britain the figures are still higher. There are supposed to be 55,000,000 sheep in the United Kingdom, and in 1859 we imported the fleeces of about 22,000,000; and if the whole of this wool, both native and imported, were subjected to the process, it would yield upwards of 19,000 tons of carbonate of potash, worth £570,000. Of course it is not practicable to recover the whole of this, for a good deal of wool will always be washed on the small scale, when the potash cannot be profitably recovered, and the operation must therefore be restricted to the great manufacturing centres, where it can be carried on a large scale, and in a continuous manner. The matter, however, is not on that account the less important to the farmer, for the rise of an industry of this kind brings forcibly before him the extent to which valuable substances are being removed from the soil. The wool produced in this country carries off annually 14,000 tons of carbonate of potash, equivalent to 9,500 tons of pure potash, all of which is at present entirely lost, and which it would cost nearly £200,000 to replace if the farmer bought it

in the market even in its cheapest form. It is to be remembered too that potash is the very substance of which, according to the modern system of manuring, we return the smallest quantity to the soil, so that if at any time our land should show symptoms of exhaustion, it will most probably be due to deficiency of potash. There seems no good reason why the farmer, though he cannot recover the potash in a pure state, should not wash wool in a systematic manner, and apply the fluid as a liquid manure to the soil. Although the yolk must be considered as a refuse matter, its presence has an important influence on the quality of the fleece. When it is deficient the wool becomes harsh, more or less brittle, and unfitted for the manufacture of the finer fabrics. A proper supply of it must therefore be of much importance, and can only be maintained by attending to the health of the animal; but unfortunately it is liable to be removed, and it is necessary to protect the animal as much as possible against its loss, or to produce some substitute for it. In those localities where much rain falls, the yolk, from its solubility, is liable to be washed out of the fleece, and the quality of the wool is thereby affected. In these districts it is customary to resort to the practice of smearing the sheep with various mixtures. This process is usually stated to be also employed for the purpose of protecting the sheep from the effects of cold and wet. For the former of these purposes I think it must be admitted that it can have no efficacy, for it seems impossible to conceive that the application of a small quantity of a greasy mixture to the skin can be of any use to an animal so well protected from cold. The real use of the smear is to destroy the tick and other parasites which infest the sheep, and by its oily nature to keep the wool in a soft condition. The mode of application of the regular old-fashioned smear was of the kind least suited to fulfil this object. The substance, always a greasy mixture, was rubbed into the skin in place of being applied to the wool. In practice, no doubt, what is applied to the skin gradually spreads itself through the wool; but in the meantime the thick oily coating is far from favourable to the proper performance of the functions of the skin, stopping up the pores, and preventing exhalation from them, while the substances mixed with the grease occasionally produce irritation of the skin. In fact, the application of such substances to the skin appears to be a violation of the laws of physiology, although their application to the wool itself might possibly be defended on the principle of keeping it in a soft and elastic condition, and preventing it acquiring a harsh and coarse texture—in fact, acting as an artificial yolk, when that is washed away by the rains. Of course this opinion goes on the assumption that the yolk really is washed out; but whether this happens, and to what extent, is a matter in regard to which there is no very definite information. I am inclined to think that the extent to which it occurs is over-rated, for it must be remembered that the wool in its natural condition repels moisture, and it is probable that water can penetrate it in sufficient quantity to affect the yolk only under exceptional circumstances. That this must be the case, I think, derives confirmation from the fact that the process of smearing is gradually disappearing, and is being more and more replaced by that of dipping, the object of which is merely to destroy parasites. It would be out of place to enter here into minute details regarding the composition of the various smears and dips in use in different districts, for they are really endless in number, but it may be useful to make a few general observations regarding them. They are either made up by the farmer from receipts which have been long in use and are well known, or they are manufactured by persons who make it their business. The oldest kind of smears were mixtures of grease, butter, palm oil, or other fatty matter with wood tar, or brown spirits of tar, and sometimes a little sulphur, resin, or soap. To these poisons were afterwards added to destroy the tick, those in most common use being arsenic, corrosive sublimate, and white hellebore. These materials were melted together and applied by separating the wool and rubbing the mixture well into the skin. Dips are mixtures of a similar kind, but generally containing a larger quantity of soap, in order to enable them to be mixed with the water. They consist in many cases of soft soap, tallow and oil, soda, and tar, which are well mixed together with the addition of some water, so as to give the whole a proper consistence, and the poisonous substance is stirred in while they are hot, or sometimes is added to the water in the first instance. Of course there are endless varieties in the nature of the mixture

and the mode in which the materials are combined, each of which claims some superiority. In general, the mixtures made by farmers themselves are of a simple character, but I have seen a receipt in which almost all the substances already mentioned were mixed together, somewhat on the same principle, I presume, as that on which unskilled physicians are said sometimes to mix together a variety of drugs in the hope that some one of those he uses may produce a beneficial effect. When the farmer makes up a dip for himself he may rest assured that the simpler it is the better. Very little good can be expected from the mixture of a variety of different oils or of several poisonous substances. In regard to the latter especially, too great care cannot be exercised, and the risk of accidents from poison being kept on the farm, and of carelessness on the part of those who use the dips, is one of the great objections to the practice of the farmer preparing for himself those poisonous mixtures. Several cases have come under my notice in which the disadvantage arising from poisons is well illustrated. I particularly remember a case of malicious poisoning of calves, which undoubtedly arose from the suspected person having got access to arsenic which was kept on the farm for making a dip. A large number of calves—seventeen or eighteen, so far as I now remember—died with all the symptoms of poisoning, and, on an examination of the contents of the stomach, arsenic was easily detected in them. The animals had been fed on cooked linseed, and although none of it remained, I was able, by examining the pot in which it was boiled, to detect it there; and suspicion pointed to a particular farm servant who was known to harbour an ill-will towards his master; but the fact that arsenic was kept on the farm rendered it impossible to bring the thing home to him—for there was no means of proving that he had had access to it, and that the other farm servants had not. The fact of arsenic having been kept at the farm in this case defeated the ends of justice, and no doubt also formed the temptation to use it. The man would have hesitated long before he ventured to buy it, and had he done so the crime would have been brought home to him with unerring certainty. Accidents also occasionally occur from the careless use of poisons in the dips. This is well illustrated by what happens when arsenic is employed. That substance dissolves with great difficulty in water, and being sold in the form of a very coarse powder, part of which is in grains as large as those of sand, it falls rapidly to the bottom of the fluid, and can only be kept imperfectly in suspension by constant stirring. When this is not properly attended to, and the dip is nearly exhausted, it sometimes happens that the last sheep get far more than their due share of the poison. Particles of arsenic adhere to the skin and produce irritation, or being absorbed into the system affect the general health of the animal. Of course this illustrates the misuse of the poison, and it is against this that it is necessary to guard. As far as the destruction of the tick is concerned the action of these poisons leave nothing to be desired; the risk which attends their use is the sole difficulty, and that may be got over by the exercise of sufficient care. Notwithstanding this, accidents do occur, and hence a demand has arisen for non-poisonous sheep dips. Several of these have recently come into use, and they appear to be made chiefly from certain coal-tar products, oil and alkalis. In one, that portion of the coal-tar oil which is heavier than water is employed, and its action is attributed to its containing a substance called carbolic acid, which closely resembles the creosote extracted from wood tar. It is doubtful indeed whether they are not identical, and it is well known that a great deal of what is now sold as creosote is actually carbolic acid. The action of a smear or dip containing this part of coal tar cannot differ materially from that made in a similar manner from wood tar, and it is not easy to see wherein the superiority consists unless it be in economy of cost. The other dip is made from a portion of the coal tar which contains no carbolic acid, and it is stated to be equally efficacious in destroying the tick. The use of products from the distillation of bituminous substances for the manufacture of sheep smears is by no means new. It dates back a considerable period, a patent having been taken for the use of the oil obtained from bituminous shales (which contains carbolic acid) so long ago as 1770, although it does not very clearly appear how it was employed, and the substance probably never came into general use. It is only of late years that these substances have been again resorted to, and how far they have proved superior to mixtures containing wood tar I am unable to state.

It is not easy to form any opinion regarding the relative advantages of different dips or smears, but it may be stated generally that those made from the purest materials are to be preferred. Hitherto the great object of the manufacturer appears to have been to make them as nasty as possible, which may be very right when any virulent poison is mixed with them, because the sheep are thus prevented from licking it; but on the other hand, it is proportionally injurious to the wool. The fact is that the inferiority of laid wool depends to a great extent on the difficulty the wool scourer finds in removing the filthy matters contained in the smears; and what at the present moment is most required, especially in the case of a smear, is a mixture which shall not colour the wool and shall not be too easily removed by water, but can be completely extracted by the materials used in scouring it. In order to attain this object it seems most reasonable to use the purest materials which can be obtained, and as the chief disadvantages arise from the colour of the tar, there seems no good reason why carbolic acid itself should not be used. Of course, it is much dearer, but a comparatively small quantity would probably suffice. In the manufacture of dips and smears there appears still to be great scope for improvements; and the attention of manufacturers should be directed to devising some mixture which shall in a manner waterproof the wool, and shall yet be easily extracted from it without leaving any colour; and it is probable that this will sometime or other be accomplished. From the facts I have brought under your notice on the present occasion, it will be seen that there are many points besides the nature of soil, manures, &c., in which chemistry can assist the farmer; and I trust it will be found that some information and instruction may be derived from what has now been said. Whatever we may otherwise think, I imagine that no one can fail to see the advantage of looking at the same thing from different points of view, and examining both the sides which are proverbially to be found in every question.

The EARL of CAITHNESS said that he could not allow the party to separate without giving expression to the interest with which he had listened to the address which had been so clearly given by Dr. Anderson. He was not himself a sheep farmer, nor could he claim to possess an intimate knowledge of the subject; but coming from the extreme north of Scotland, where sheepfarming was so important, he felt very strongly the necessity for taking advantage of every improvement. He believed they were all too much inclined to go on in the old way, while they ought to be constantly making progress, and he was glad that Dr. Anderson had directed their attention to the question of the management of wool; for he was satisfied that in all that related to it there was abundant room for its

improvement, and he trusted the address they had just heard would be published.

Mr. GENTLES, Lochness-side, said that he could not agree with the conclusions to which Dr. Anderson had come with regard to smears and dips. He had never used anything but smears all his life, and always with success; while those who had used dips had always lost their wool. He considered dips of no earthly use, and in spite of all that science could say to the contrary, he meant to continue to use smears.

Mr. PATERSON, Birthwood, said that his experience was exactly the opposite of that of the gentleman who had just spoken. He had used both smears and dips, and he had never seen anything but unsatisfactory results from the former, while the latter had in his hands always succeeded. It was quite true that where dips were used the weight of the fleece was smaller than when it was smeared, but the greater value of the wool more than counterbalanced the diminution in quantity. He had always used arsenic in his dips; but he had taken care to mix it up well with the other materials, and had never seen any of the bad effects to which Dr. Anderson alluded. The great defect of all the substances applied to the wool was that they could not be removed satisfactorily by washing, and especially where tar was used it resisted all the efforts of the bleacher. He would like to ask Dr. Anderson whether gum might not be employed with advantage in making dips.

Dr. ANDERSON said there was an old saying as to who should decide when doctors disagreed? which had been often quoted to the disadvantage of science; but he thought that what they had just heard raised the far more difficult problem of who should decide when practical men disagreed? It was impossible for two persons to be more diametrically opposed to their views than the gentlemen who had just spoken; one upholding smears as keenly as the other condemned them. He thought that they might derive from this an instructive lesson, for it taught them that they must not dogmatise. Science and practice were in fact only two different modes of arriving at the truth, and when our knowledge was perfect we should be enabled to explain and reconcile the discrepancies which arose. Mr. Paterson had somewhat misapprehended what he (Dr. Anderson) had said regarding poisons. It was not their use, but their careless use, that he condemned. Arsenic, especially, was a most valuable substance, in consequence of the specific effect it produced on the skin, which made it the sheet anchor of the physician in treating all diseases. Mr. Paterson had obviously used it with care, and the result had been satisfactory. As regarded gum he did not think it could be used with advantage, because it was too soluble. What was wanted was some means of waterproofing the wool, as it were, and he thought that something of the kind would yet be devised.

KEIGHLEY AGRICULTURAL SHOW.

The twenty-third annual show was held on Friday, Sept. 1. The Keighley show has always taken a position amongst the Yorkshire agricultural meetings. Amongst the visitors to the show-ground were, the Marquis of Harrington, M.P., Lord Frederick Cavendish, M.P., Lord Edward Cavendish, M.P., Sir Francis Crossley, M.P., Mr. Busfield Ferrand, M.P., Mr. Holden, M.P., Mr. W. E. Forster, M.P., Mr. G. Hardy, M.P., and Mr. Akroyd, M.P. About £509 was offered in prizes, including ten silver cups; and the entries exceeded one thousand, being a large increase on those of last year. There was an excellent display. The silver cup for the best three Shorthorns was taken by Mr. R. Eastwood, Thorneyholme, Clitheroe. Lady Pigott had entered for this and other prizes; but her Ladyship resolved not to send animals for competition, so long as the cattle plague prevails. Mr. Jonathan Peel obtained the prize for the best bull on the ground. The Shorthorn cow of Mr. Eastwood's, "Brampton Butterfly" (second at the Lancashire show at Oldham), here proved superior to any other, and his "Rosette," which has obtained different awards at many places, was a good second. The silver cup for the best hunter was

taken by Mr. James Charnock, Halifax; and Mr. Brady Nicholson, Sturton Grange, obtained a similar prize for leaping. Mr. H. T. Percy, Howsarrigg, took the prize for roadsters, with his mare, which has for two years past taken the first prize at the Agricultural Hall, Islington. Mr. Percy also showed the best cob—an animal which gained a similar honour at Islington this year. There was an excellent show of draught horses, Mr. T. Walker taking the only prize. In sheep the silver cup was awarded to Mr. John Jowett, Prospect Villa, Keighley, as having the greatest number of first prizes. He was a head of Mr. Simpson, of Spofforth Park, the celebrated sheep breeder, by one prize. There was a numerous and choice collection of pigs; the best boar of the large breed, belonging to Mr. J. Dyson, Leeds, weighed no less 106 stones. The judges were—Shorthorns: Mr. John Patterson, Hall Beck, Ulverston; Mr. Henry Peacock, Haddockstones, Ripley. Horses: Mr. John McTurk, Acomb, York; Mr. Benj. Taylor, Ulleskelf. Sheep and Pigs: Mr. George King, Becca, Milford Junction; Mr. Wm. S. Robson, Great Ouseburn, York. Lark Sheep: Mr. George Browne, Troutbeck, Windermere.

INLAND RIVER IMPROVEMENTS.

In this article we propose continuing our observations chiefly to the improvement of those rivers that flow in comparatively level valleys, leaving for our next and concluding article of the series the investigation of mountain streams. Practically speaking, therefore, our present example may be presumed to begin where our last one (No. II.) ended, viz., where the tide at high-water ceases to dam back and injuriously effect the drainage of the adjoining lands on both banks, and to end where our next article (No. IV.) begins. Our remarks, as in the preceding article, will chiefly be restricted to geometrical principles, or those considerations involved in the proper form and inclination of the channel of the river and its embankments. In other words the general progress of things imperatively demands a thorough reformation in our river policy, and we shall endeavour briefly to discuss the scientific principles involved in carrying out such a work of improvement.

The grand desideratum is to lower the surface-level of the water so as to afford a greater depth of fall for land-drainage, and to reduce the flow of the river to a uniform velocity, such as will keep the channel clear, without washing away the banks in high floods.

It is an easy matter to draw black strokes upon paper in any direction from a meridian, and at any angle with the horizon; but in the vast majority of our large valleys there are ninety and nine difficulties in the way of reducing fine theories to practice; and this is exactly the position in which we find ourselves when we begin practically to lower the surface-levels of our large rivers and their tributaries in order to meet the loud, long, and lusty demands of the British farmer. You may as well, and much safer, meddle with a wasp's nest than with a miller's mill-dam and water-wheel; and yet, come when the crisis and final ultimatum may, the practical conclusion is meanwhile manifest enough to all who can read the signs of the times, for surface-levels must be lowered.

To find the depth to which the surface-level of the water at any point can be lowered by deepening and straightening the channel is, then, the first practical question for solution; and the second is of a kindred character, viz., the velocity that requires to be given to the stream, in order to avoid silting on the one hand and washing away the soil on the other. The two, as has practically been shown in the preceding article, are inseparably connected together, for the former is obtained by deducting the latter from the total fall of the river between the upper and lower points or extremes of the survey, or work.

The total fall of the river between the two extremes in question may be obtained by the common process of levelling, with levelling instruments. The angle of inclination which the surface of the ground or the river makes with the horizon, may be determined at any one point by means of an angular instrument, such as a theodolite, or some kind of draining level; but it is seldom that this does more than give an approximation as to what the angle of inclination of the new channel, or of the old when deepened, should in reality be at that same point, provided it is free from silting or washing away. The more advisable plan is to obtain the total fall and length of the river, as this will furnish the dimensions required for setting out the improvements with geometrical accuracy.

The total fall is sometimes easily obtained by what are termed "*natural water-levels*." If, for example, there are mills on the river or canal-locks uniting one part of the river with another, so as to make the whole navigable, then the sum of the falls at the mill, or at the canal sluices, will give the total falls sufficiently near, generally speaking, for the work of improvement. Sometimes, again, the water in the open ditches outside the embankments can be dammed, so as to find the fall, provided the water in the one dam falls directly into the water in the other, as the sum of the falls under such condition, would give the total fall.

Having obtained the total fall, and length as the crow flies, the next thing is to determine how much the bed of the river can be deepened in certain shallow places, and straightened at

crooked places, so as to reduce its actual length. If a single shallow, ford, or rapid can be deepened, and a bend of the channel taken off, it may greatly lower the surface level above these places, and thus facilitate the work of deeper drainage in the whole of the adjacent estates and farms on both sides farther up the river. Sometimes, again, narrow places, by confining the water, raises its surface, thereby damming it back above these narrow places. Less or more of this damming and tailing back process is experienced at bridges, jetties for shipping, and the like. The widening of the channel to its proper breadth would therefore lower the surface level above, and to the extent it had been abnormally raised by such obstructions. The reaction of the water at sharp bends of the channel and irregularities in the bottom also less or more retard the velocity of the current, thereby raising its surface to a higher level than were the channel straight and the bottom a uniform incline. A straight channel of smooth uniform dimensions, and fall, discharges more water in a given time than a crooked, rough, and shapeless one, and to many, perhaps to the majority of our readers, the difference is incredible.

There are numerous mill runs that very favourably illustrate this; for where the water enters upon the mill-wheel, it is not more than perhaps a foot in depth, often only a few inches, whereas above, where it is flowing in a comparatively level cut, the depth is often five or six feet, and of a greater width also than at the wheel. A deep channel also conveys more water than a shallow one, other things being equal.

Large rivers very frequently form the boundary marches or divisions between the landed estates of different proprietors; and when estates are entailed, or heavily mortgaged, such conditions often throw magnitudinous difficulties in the way of deepening them and straightening them, so as to improve the drainage and navigation. The vested and other interests of canal companies, bleaching works, and such like, also stand similarly in the way. But obstructions arising from these sources are often more the offspring of prejudice and imagination than well-founded reality; for if the contemplated improvements are properly effected, due respect being equally paid to the interests of all the parties concerned, then they would all be mutually gainers by its completion. Thus the landowners would have their estates better drained and somewhat increased in size, mills would have upon the whole a greater fall, while canal companies would have fewer locks and shorter distances to convey goods. But with regard to canals, they are now so fast being superseded by railways that it is almost too far in the afternoon to talk seriously of their existence, generally speaking; so that if the tidal channels of rivers are deepened, shortened, and otherwise improved for navigation, and the inland channel above the old high-tide level be also deepened, the general inland navigation would consequently be greatly improved, more especially that portion of it that can now enter successfully into competition with railways. The practical conclusion, therefore, in a public light, is manifestly in favour of the improvements proposed being immediately executed under statutory authority, where interested parties cannot agree amongst themselves.

In the straightening of small tributary streams and rivulets, the well-known practical rule of "take and give" often applies with so much accuracy that the land-surveyor experiences little or no difficulty in giving in a plan such as pleases the landowners and tenants on both sides; but it is often otherwise with large rivers. This difference arises partly from the greater magnitude of the latter work, but principally from the greater difficulty of straightening large rivers, from the peculiar position which they occupy in the valleys through which they flow, and the necessity which this enforces of adopting curved instead of right lines for new channels, where such are practicable.

But in many cases, if not the majority, new channels are impracticable, so that the work of improvement is confined to narrowing broad places, widening narrow parts, and deepening shallow fords, so as to bring the whole channel into a proper

form as to depth, width, and inclination—works which invariably call for the greatest inspection, otherwise the upshot will be the reverse of improvement. Large heads here and there running round peninsular areas of land of considerable extent, where the two places of the river at the isthmus almost meet—and sometimes meet altogether in floods, thus forming islands—may be cut off, thereby straightening and shortening the channel. But in such cases the newly excavated materials are insufficient to fill up the old channel, or even make a sufficient embankment for the new one; hence the island thus formed may have to remain in possession of its present proprietor, and require a bridge to gain access to it.

A new cut through an isthmus or narrow neck of land, as above, is sure to increase the velocity of the river through it, and therefore suitable provision requires to be made to protect its banks above and also the head of the channel immediately below it, otherwise land will be washed away in both cases, thereby endangering the adjoining fields in heavy floods when the river is much swollen and its velocity and force greatly increased.

From the increased force and undermining action of swollen river-flood—the surface level being up to the top of the embankment and often “tipping over”—the connecting new channel through the isthmus should be curved and not straight, and the concave slope, both of the channel and embankment, should be opposed to the downward current of the river, and also have a greater inclination and altitude than that of any straight portion of it. The convex slope may, on the contrary, be made at a somewhat more steep inclination upwards, there being less pressure upon it. At the same time, although this is sound in theory, and often commendable in practice, in order to avoid silting, yet the more advisable course in the vast majority of examples is to make the convex slope of as great a length as circumstances relative to curvature will permit, so as to avoid silting; for when silting on the convex slope takes place, acute elbows are formed, with all the tailing back above, and injurious consequences below, that never fail to follow the existence of acute elbows during heavy floods.

In examples where the channel of the river above such new cuts through narrow necks of land can be lowered so as to reduce the velocity of the river to that which it had in the old channel, the danger to which such new cut and the heads of the channel below are liable will also be reduced, and when such is practicable no time should be lost in getting the upper surface levels of the current lowered, so as to reduce its velocity and power of doing harm in times of long-continued much-swollen floods.

To those who have not had their attention experimentally turned to the subject, the undermining effect upon the banks and embankments, which a very small increase in the altitude of the surface level of a swollen river produces, is almost incredible. To avoid repetition, the practical details of this part of our subject will be more fully gone into under “Mountain Rivers.” Meanwhile we shall only observe that we have personally known an increase of twelve inches sweep away everything before it, in a manner which language cannot describe so as to be practically understood. Now, as lowering the surface level of the river twelve inches in one part is tantamount to raising the surface level above that part twelve inches, the practical conclusion as to the consequences need not be drawn, as it must inevitably wash away soil, and in all probability, if the swollen flood continues for any length of time, break through the embankments also, and thus form a new channel adapted to its altered circumstances, as the laws of Nature or forces involved may determine.

If nothing is done artificially to deepen the bed of the river above the new cut that shortens the channel, the increase of velocity of the currents, and scooping effect of the same, will eventually perform the work of deepening, provided the bottom soil is similar to the staple. In such cases, the natural process of deepening requires to be closely watched by the adjoining proprietors, otherwise injury to the slopes of the channel and embankment will be the upshot during the first heavy flood. Harm may even be produced by the river in its ordinary state; so that the protection of the banks at the bottom of each incline, or that part of the channel exposed to the scooping action of the water, may require artificial interference immediately.

The “*Take it easy*” method of leaving flowing water to take care of itself, under circumstances of the kind in question—a rule too commonly followed—is a highly reprehensible practice, being the very reverse of that which ought to be pursued. If the channel is straight, the risk will be reduced to a minimum, because the natural tendency is a right line with the greatest depth of current, and, consequently, scooping action in the middle of the channel. But, in practice, straight channels are the exception, and crooked ones the rule; and, under such conditions, the greater depth and scooping action of the flowing stream will be either towards the one side or the other—generally towards the concave bank—unless natural or artificial means interpose, so as to deflect the current into a different course. The true plan in all such cases is for art to assist nature in the work of deepening the channel in the middle.

ΓΕΩΜΕΤΡΗΣ.

ON THE IMPORTANCE OF ECONOMY IN THE PRACTICE OF AGRICULTURE.

At a meeting of the Croydon Farmers' Club, Mr. E. STABLES, of Fickleshole, said: Mr. Chairman and gentlemen, our subject is “The importance of economy in the practice of agriculture.” The wise man says, “to everything there is a season, and a time to every purpose under heaven.” Now, it certainly is not the time to talk over the profits of the past three years, but it will readily be allowed that it is the proper time to inquire how are the profits to be obtained? And if so, the economy of production must form a very important part of the general question. But, before we inquire as to the importance of economy, the question naturally arises, What is economy? What does it consist of? Perhaps that question can be best answered by first referring to what is not economy. In the first place, then, we will state without fear of contradiction, that bad farming is not economy; and, in the next place, we will assert with equal boldness that a too limited use of manures is not economy. I am convinced that the generality of the farmers of the present day make a grand mistake here. After having incurred all the fixed charges against the crop, such as rent, taxes, labour, and all the sundries which cannot be avoided, how common it is to see only half a crop, solely for want of a moderate outlay in some suitable manures. I would ask is it economy to spend £5 an acre for half a crop, or £6 per acre for a full crop? It is not economy to over-

work or underkeep, or in any wise neglect the farm horses. An insufficiency of nourishing food to the live stock generally is not economy. It is a common mistake to allow an animal about sufficient food to enable him just to maintain his condition; whereas a little more—only a little more—would enable him to improve and leave a profit, often to double his value in the course of six months. It is not economy to allow an animal a sufficiency of food, and not also to provide him suitable lodgings, and a good bed, and also to see to it that he is kindly treated; that he is in circumstances, and surrounded by circumstances, in which he can be happy and contented; if he is in constant fear he cannot thrive. My own experience is, that it requires one-third more food to keep up the animal heat when exposed in a cold yard, than when suitably and comfortably housed. I believe that if farmers generally knew how much they annually lose for want of suitable shelter for the animals and their manure, the landlords would hear more about it. What we want in a farmstead is such buildings as will enable us to make the best of the stock and crop, otherwise we cannot farm with economy and profit. It is not economy to allow either animals or implements to get out of repair. How true is it that “a stitch in time saves nine!” “For want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the rider was lost.” How many

a good horse has been ruined for want of a little timely rest and medicine! It is not economy to allow the land to get out of cultivation; one year's seeding will cause seven years' weeding. A farm may soon be run out of condition, but it takes a series of years of expensive and unprofitable cultivation to get it into a profitable state again. Whatever may be the seasons or markets, profits and losses to one and all, I would say, if it be possible, keep your cultivation up to the mark. Unfavourable seasons require additional outlay, both in the cultivation and in the application of manures; whereas it is a common practice (especially if we have, as we lately have had, low prices in conjunction with unfavourable seasons) to let the land out of condition. It is suicidal policy. Not only does it cost much more to get it into condition again than what was saved by running it a little, but when good seasons and better markets come where are you? Why busy enough getting your land into cultivation, which you will accomplish in time for another wet season and low prices. But whilst true economy does not consist in unduly reducing the outgoings of the farm, nor in producing middling crops at a small expense, but in producing the largest results at a moderate cost, I am convinced there is often much lost for want of a due attention to the minutiae of the expenditure. The aggregate expenditure is made up of various items, and if the various items were examined one by one, it would be easy to prove that on some farms from twenty-five to fifty per cent. of the expenditure is wasted, especially on farms occupied by gentlemen who have spent the early part of their lives in the commercial world, and have realised a fortune, and naturally enough think they would like to farm; and because they don't know much about it themselves, rely upon the bailiff; and what is the consequence? True, they generally succeed in growing respectable crops; but what about the expenditure? It may be quite as healthy as they expected; but where are the large profits they prospectively boasted of? A good education is of great importance to the farmer. He should know almost everything. He should understand the scientific and theoretical part of his business; but woe unto him if he is not thoroughly up in the practical part. In the simple operation of ploughing the land, I have often seen a man and a boy and four horses, using an antediluvian plough, doing about two and three-quarter roods per day. Reckoning each horse at 3s. 6d., the man at 2s. 3d., and the boy at 1s. 6d., this costs 25s. per acre; when over the hedge, on similar land, you might see a modern plough worked by one man and three horses abreast, doing an acre per day with ease, making quite as good or better work than the other, and, reckoning the horses and man at the same rate, at an expense of 12s. 6d. per acre, being a difference of £50 per cent. in the expense of the operation. And if you look out at seed time, you will probably see, if the seed is sown broadcast, one man pretending to sow with one hand, and getting over about six acres per day. In the other, you will probably see a man using both hands, and doing twelve acres a day, and making better work; nay, I have even seen two men, one boy, and two horses, using a drill, with coulters jacked up, putting the seed on broadcast, costing two shillings per acre, where the work might have been equally well done for 3d. per acre. Don't understand me to recommend broadcast sowing; I would always drill when the land is in a proper state. Then, again, in the operation of harrowing; in the one case the old-fashioned wooden harrows will be drawn over the ground three or four times; and in the other ease twice over with a modern implement will make quite as good work, and much better if you don't want the land treading; and if you follow out the various operations on the two fields until you get the corn into the market, reaping in the one case with the sickle, and in the other with the reaping machine—thrashing in the one case with the most primitive of machines, and in the other with the steam engine—you will find a difference in the expense of about 50 per cent. throughout. The importance of economy is strikingly evinced in the different modes of working the fallows. The old system—that of working exclusively with the plough and harrows—is very expensive. In this way, four or five ploughings and harrowings, and rollings out of count, is necessary to make a respectable fallow. True it has been well exposed to the atmospheric influences, and in that way has been much benefited; but it is very doubtful whether the couch grass and other weeds have been destroyed, unless the weather has been very dry and hot. There has not been time

for the couch, and especially the knot-grass, to die before it must be ploughed in again, and with such frequent ploughings the soil is generally in a rough state, and unfavourable to the germination of the seeds of weeds. Of course it is a very important part of the following operation to cause the seeds of weeds to germinate, which is certain destruction to them. It is also important to bear in mind that there is a class of weeds, such as the dock, which cannot grow without the crown. In this case a shallow broadsharing in the autumn is far more effective than several deep ploughings in the following summer. If you take off the top of the root with the broadshare, and keep it on the surface of the ground, occasionally moving it with the harrow until it is dead, there is no need to trouble about the bottom part of the root: it will never grow without the crown; but the crown will grow if it be in the ground at all with ever so little root to it. Some of our modern farmers disband the turnover plough altogether, using the cultivator exclusively in the working of the fallows; and certainly it is a much better and a much cheaper mode than the old fashion of ploughing and harrowing. But my opinion is that a medium between the two extremes is much the best, and quite as cheap as working exclusively with the cultivator. I prefer to put the cultivator two or three times through, with intervening harrowing, until the couch, &c., is worked out and kept at the top sufficiently long to ensure its destruction; and also of having the surface so perfectly pulverised as to ensure the growth and destruction of all the seeds of weeds, after which I want to see the other side of the soil, when some more couch, previously unseen, and another crop of annual weeds is sure to be the result of fresh soil brought up. The practice of some farmers is always to plough the land one stereotyped depth. Now I hold there is great economy in varying the depth—once in a course of cropping. When it is fallow, I prefer to have it thoroughly bottomed; then, cost what it may, I want it ploughed as deep as it well can be ploughed. The leys and general seed furrow I plough a moderate depth; but after the sheep I prefer either to plough very thin, or, if the field is not so clean as desirable, I use the cultivator instead of the plough. I consider that ploughing various depths is not only a great saving of actual and direct expenditure—four inches deep not taking near half the power of eight inches in depth—but is also most economical, inasmuch as the evils of the old beaten, almost water-proof bottom is avoided. The importance of autumn cultivation, in an economical point of view, cannot well be overated. It is a well-known fact that couch-grass and other weeds do not make much progress so long as there is a good crop of corn on the ground; but let the corn crop be removed, the rubbish will at once begin to grow and prosper. One class of weeds will then be taking firm root hold; another will be ripening and maturing its seeds ready for a future crop; and if you allow the weeds undisturbed possession of the ground for about six weeks after harvest, then plough the ground a nice depth, the couch roots will be preserved in good health, and the seeds of weeds, then fully matured, will remain in a dormant state for months or years, as the ease may be, until they are turned up again, when, if the land is in good heart, a luxuriant crop or crops is sure to be the result. But why allow this if we are to farm with economy and profit? These weeds must be destroyed, and the sooner after the harvest the better. The cultivator must be used, the couch-grass and the roots pulled out to the surface, and the surface so pulverised as to compel the seeds of weeds to germinate. If this is done, no matter how much rubbish, if it is fairly got to the top and shoot out, and left to bleach until the winter, it may then be quite safely ploughed in; it will cause no more trouble. It will certainly decay in the ground, especially if it is buried a good depth. It is not easy to estimate the importance of this in an economical point of view. The difference in the expense between cleaning the land in this way, and of allowing the weeds to increase, greatly impoverishes the land, whereas it derives great benefit from atmospheric influences in the process of these autumn fallows. The economical farmer will also be careful to apply the proper kind of manure to his various crops, and he will also be careful to apply them at the right time. A great deal more effect is produced from manures thus applied than when improperly applied. It requires good judgment and some experience to know when the application of artificial manures is likely to pay. It is folly to expend money in manure, if the crop has other difficulties to contend with—if the land is in a rough, unkind state—if it is foul with weeds—or if it is wet for want of

draining; but if it is clean, if a good tilth has been obtained by using the cultivator freely, and other circumstances are favourable, a judicious outlay in manures will almost invariably leave a large profit upon the outlay—I say a judicious outlay. The different kinds of crops require different nourishment, just as the different kinds of animals require different kinds of food suited to their constitution, and supplied at the proper time, *i. e.*, frequently. I don't believe in a heavy dressing of manure once in two or three years, any more than I believe in supplying an animal with food to last him two or three weeks. The animal will not only waste his food, but he will not thrive at all; he will be glutted one day and famished the next. I would not only supply this land with nourishment every year, but two or three times a year where it is practicable. It is sound philosophy not only to get the land into good heart, but to keep it in good heart. As a matter of economy the proper direction and supervision of the farm labourer is of importance. It is like a complicated machine, wheels within wheels, and if it is not properly constructed and directed breakage and loss is the result. I am convinced that a difference of more than 25 per cent. is often made in the amount expended in labour, attributable entirely to the general direction. Instance the difference in the manner in which the dung-carrying is done. In one case the cartier loads his own cart, then goes along with the cart to its destination and unloads it, perhaps in small heaps on the land—the spreading to be another operation; the consequence is that the horses are about half their time waiting for the man, and the man about half his time waiting for the horses. In another case you may see three men loading the cart, and one horse in the cart. Just as the cart is loaded, a boy with an empty cart and two horses makes his appearance. He transfers his trace-horse to the loaded cart, and away it goes. There will be other boys to drive, and trace-horses according to the distance the manure has to go. At the other end will be two men spreading the manure out of the cart direct to the land, which they will be able to do just fast enough to keep the fillers at work. Thus there will be a steady stream of manure going out, and nobody waiting, and nobody overworked. Of course the same remarks apply to all carrying operations. There is great economy in paying the men by the piece instead of by the day, whenever it can be done. Not only is the work done cheaper, but it is more just to the men. If one man, in consequence of more strength or skill, can earn more than another, he ought to be paid for his strength and skill. In common justice to ourselves we are bound to pay for work done, and not simply for time spent. We are bound to encourage skilled labour in every way we can, for we are becoming more and more dependent on it; and if the farmer is not sufficiently master of his business to be able to estimate the value of the different kinds of work done, and to let it to his men at a fair price, he must suffer the consequence of his want of skill. If a tradesman or a professional man is not skilled in his business what is the consequence? Why, he has to go to the wall. So it must be with the farmer. It is said that there are secrets in all trades, and if the farmer does not know the secrets of his own profession we bethide him. Knowledge is power, but practice makes perfect; and it is only by diligent, intelligent attention to the practical part that the farmer can qualify himself for the successful prosecution of his business. See how carefully and expensively the professional man is educated and trained for his profession; but when he is fairly aloft in the world what can he do without practical skill or good abilities in full practice? An important lesson may be learnt from the commercial and manufacturing world. If you walk round a large manufactory you will not fail to observe what careful attention is given to the very minutiae of economy. The very existence of the manufactory depends upon this. A difference of one per cent. in the expense of the productions of the manufactured article would often be fatal to its success. The large fortunes that have been realized by some of the manufacturers is, as a general rule, the result of small (often very small) profits upon a large trade. Such is the severe competition amongst them that all and every of the essentials of capital and skill, all the modern discoveries of machinery and chemistry, with the most rigid economy, is brought to bear, or success is hopeless. Although his profits are now much smaller upon each manufactured article than formerly, yet, in consequence of a much larger production, by means of modern appliances, his income does not suffer, but otherwise. Is it not even so with the

farmer? He is engaged in a severe competition with the whole world, and so long as the malt-tax is on, a very unfair competition. He requires all modern appliances with skill and industry, and he can make two blades of grass grow where one grew before. He can grow two quarters of corn where one grew before. And if so with ordinary seasons and ordinary markets, shall we despair of success? By no means. But another very important lesson may be learnt from the manufacturer. You will always find him paying most attention to, and producing most of that particular article for which there is most demand, and on which there is most profit. You will always find him quickly adapting himself to the wants of the times. He will not bestow his capital and skill upon an article for which there is no longer a good demand. The price of wheat has gradually declined until it is now 40 per cent. cheaper than it was a few years ago. The price of butcher's meat has gradually increased until it has become nearly double what it was 15 years ago; and this is not an accidental state of things. It is the natural effect of certain causes which will continue to operate in perpetuity. Then it is quite evident that if the farmer would succeed he must not follow the old routine. He must not do so-and-so because his father and his grandfather did so before him. Of course he must continue to grow corn, and the more the merrier; but it must be done on a restricted number of acres, so as to leave an increased area for the production of a much increased quantity of summer and winter green crops. Our corn crops must be the natural result of the green crops, and of the heavy live stock kept to consume those green crops. The production of butcher's meat must be our primary object, to which we must look for our chief profit, and the growth of corn a secondary object. There are several other points of rural economy upon which I should like to have touched, such as the importance of labour-saving machines, of providing, but especially of preparing, suitable food for the various kinds of stock, of doing the right thing at the right time, of attending to the practice of economy in the commercial transactions of the farm, of buying in the cheapest and selling in the dearest market, &c. I will conclude by reminding you that economy is not frugality or parsimony, but the economist is described in the dictionary as one who manages his affairs well. Gentlemen, I thank you for your patient attention, and I hope where I have misapprehended the subject, you will set me right, and that we shall have a good discussion.

Dr. SHORHOUSE said every one present must say that the subject given by Mr. Stables was a most excellent one. It was the best that he had ever heard. It was certainly manifest to all that growing of corn would not pay. He then referred to the new assessment, and said the rateable area had been increased, and he also referred to the lavish expenditure of money in the county, saying, let them bring their interest to bear, and say to the magistrates, "Now your area is increased one-half, instead of your having a rate at 1d. in the £, let us have it at a halfpenny." The subject, he was glad to see, was going to be brought forward at one of the clubs. He had never seen such lavish expenditure of public money as there was in the county of Surrey. They had idiotic asylums, gaols, and palaces, and they were splendid palaces, which they were called upon to support, and economy was therefore necessary. He would just say something about sheltering of sheep. Mr. Meeli had said that temporary shelter for sheep could be had for 1s. 3d. per week. In keeping sheep under shelter in cold weather they would not lose that quantity of fat as if they were kept out in the dripping wet and cold, their fat being consumed in keeping up the heat of the body.

Mr. WALKER thought that economy in starving stock or land was no economy at all, and he must give Mr. Stables credit for the subject he had given them.

Mr. SMITH said although he was not a farmer, he must say that the subject introduced by Mr. Stables was a deeply interesting one. It was notorious that England was a receiver of raw produce, which she manufactured, and by manufacturing the raw produce she received she grew rich. He thought the more that live stock was attended to, the better it would be for England. It had been said that although the British farmer could produce the ox, he could not produce the poultry; but he must say that when looking round Leadenhall market he saw very good poultry there. They could not get so much out of poultry as they could out of stock, but he thought poultry was worth a farmer's consideration. He could not help it if his

granddaughter preferred sitting in the parlour and playing the piano instead of taking an interest in what was in the yards. In conclusion he hoped they would not neglect the poultry for the ox. It had given him much pleasure in listening to the subject Mr. Stables had favoured them with.

Mr. WALTON wanted to know a little about the scarifier. A great deal had been said about it, but his men did not care to use it. He had got a scarifier in his yard, and he wanted to know how to get it from there. Was he to plough first, and then cut his sods into pieces, and must he then put in his scarifier, and if he could not move it then with six horses must he put on twelve? He must say that this scarifier had completely scarified him. He had a lot of sheep, and he fed them with oil-cake and other food, but he had no turnips for them. If he said to his man, "How do the sheep get on?" he would say, "O, pretty well, but they want turnips." Turnips, turnips, was all he heard of; but he wanted to know how to get them. Now about the shelter of sheep. To put sheep in a yard and carry their food to them, and then to have to carry away their dung—he did not consider that would be economy.

Dr. SHORTHOUSE said it was temporary shelter he meant. They could get asphaltic very cheap, and it would last 20 years.

Mr. WALTON was sorry to say that it would not. The question was whether it would pay to keep sheep in their yard, and then carry their dung out on their turnip land. Was it economy to put in rye and tares for the sake of getting the sheep's dressing? Perhaps he would tell them when green summer crops could be grown with advantage.

Mr. WOOD said he was going to answer with regard to feeding sheep under sheds so as to have their dung carried out. He did not know the number of the *Farmer's Magazine*, but in one of the numbers of that periodical, which should have a place in every farmer's library, there was a most excellent paper which had been read at the London Farmers' Club, and it was there stated that it had been carried out with advantage. He must say that the subject they had that evening listened to was a most excellent one, and he was much obliged to Mr. Stables for it.

Mr. BROWN said they had got to thank Mr. Stables very much for even putting them in mind of economy. It was good for them to be put in mind of economy. As they had been going on, they had every reason to act with economy. With the price of wheat as it was now, they would find that after they had paid for the labour and all other necessary expenses, they had very little left as profit. In the way of sheep, where the land was sticky, if they were to put them in a temporary place at night only, they would be able to lie down and sleep with comfort; otherwise, if they were left out they would lie down with trembling. He did not approve of making all their dung with sheep; that he did not think would answer. With regard to horned stock, many had not got covering for them, and when they saw them in the yard they must know that they were going back. With regard to the sale of stock, they must not expect to get high prices, but still, as Mr. Stables had said, he hoped they would get better prices than they were at present getting.

Mr. WALKER was not opposed to occasional shelter for sheep, and also having a good lambing shed. He thought there was nothing like sheep for land. They not only trod in their dung, but there was also their urine, which was of some value to the land, and he thought that, when practicable, they should have sheep for the land. With regard to stock—and he was now speaking of his own experience—he knew that stock got fat in warm places, and they got fat with half the quantity of food. If they kept stock in cold places it would take all the food they gave them to keep them, but they would not get fat. With regard to green crops—if Mr. Walton wanted to sow rye and tares, the best time to sow them was in the month of September; but he did not think a good farmer would grow much of that stuff. He (Mr. Walker) did not recommend this at all. What he would say in reference to this was, get out the tares as soon as possible, and thus get your land as clean as possible. To sow rye and tares he should say the best time would be September or the beginning of October; but he would not advise his doing so at all. He never did it himself. With regard to swedes, he thought they ought to be in by May; he intended to have his in by that time. He had grown tares, but he grew them for horses on corn stubble.

Mr. WALTON said he had put out the question because he had tried rye and tares, and he had a notion that they were valuable. He had tried a piece of land to get it into heart by rye and tares, and in the year 1862 he grew four quarters of wheat to the acre. After that he thought he would have wheat again, and he sowed tares, and as the tares came off he sowed winter turnips. The whole came off in time for him to put in wheat on the 25th or 26th of September, and it was now the finest piece of land he had. By the time they met again he should be able to tell them whether it was a success or not.

Mr. WILSON thought they were diverging from the subject for that evening's discussion. Having referred to the practice of economy, he said it was not economy to starve their horses, neither was it economy to pay their labourers 10s. a week, which, he was sorry to say, was the case in their neighbourhood. Referring to the number of horses he kept on his farm, he said that some had told him that two horses would do the same amount of work as four. Now, what was he to do, a cockney farmer like himself?

A VOICE: Try both.

Mr. WILSON went on to say that he saw many old farmers in the county still patronise the four-horse round plough, but his men did not like it. He formerly kept five horses on his farm, but he had come to the determination of only keeping four. He should like to know if that would be economy? He had wished to do without a boy in ploughing, but he had been told that with a turnwrest plough it could not be done. With sheep, he quite agreed with Mr. Walker, that their proper place was on the land. During the late hard frost he had his sheep fed on swedes in the yard, but he must say that he should not like to cart away all their dung on to the land.

Mr. HUMPIDGE said they were very much indebted to Mr. Stables for the subject he had favoured them with that evening. It was a subject brought forward for discussion, but he must say that they had not had any discussion on it. They had diverged from the subject of economy, and gone on a subject relating to the land. Mr. Stables had advocated deep ploughing. He should like to know whether it would be advisable to do so on a chalky soil, and where there was not much soil over the chalk, and whether it would be desirable to do so on such soils so as to bring up the chalk. He (Mr. Humpidge) was an advocate for deep ploughing, and he was ploughing pretty deep now on a chalky soil, but he should like to know if it would be desirable to bring up that chalk. With regard to the keeping of three horses, where the work was said to be rather too much for two, he had tried the experiment, and he had found it to answer most admirably. Mr. Wilson had said that he had come to the conclusion of keeping four horses where he used to keep five. He should say to him keep three only, for two might be made to do the work generally. Now, with regard to the manure, Mr. Stable had said he kept two men spreading the dung. It had always occurred to him that it was a hindrance to throw it from the cart. He had thought it would be better for a man to follow and spread the dung after it had been taken from the cart. With regard to education, he thought a farmer could not be too well educated. They had a great deal to learn, but they could not learn too much. There was a gentleman present who was a stranger to the members of the club, but he hoped he would not be so long. He had made some remarks with regard to the keeping of poultry. He (Mr. Humpidge) would say that they picked up a great deal of corn that would otherwise be lost and wasted. He must certainly say that chickens thrived remarkably well. He once heard of a housewife saving £200 from the poultry, and when her husband wanted it she gave it to him. Such a sum from such a source would be very useful in these hard times. He would not advocate deep ploughing on all occasions. With regard to the shelter of sheep, he should say that it would be a very difficult thing to do so for a permanency. [Dr. SHORTHOUSE: It was not for a permanency; it was only temporary.] He thought cattle could be kept with more advantage than sheep. When sheep were kept on hot dung they were liable to get the foot-rot. The foot of the sheep grew very fast, and when they were kept on hot dung they got the foot-rot. With regard to rye and tares, he did not think it would pay to sow them where the land was clean. He thought they could more advantageously sow stubble turnips for spring, and he had known them grown with advantage. He must thank

Mr. Stables for the subject he had given them that evening, and which he must say was most excellent.

The CHAIRMAN said his duty that evening was an exceedingly easy one. All he had to do was to reciprocate the opinion of others. He did not think that they had had such a subject for some years. He did not say that in any way to seek to disparage what had been done before. Having referred to the number of papers they required during the year, and that the vitality of that club depended upon them, he went on to say that he agreed with Mr. Walker that it was most practicable to have the sheep upon the land. They had had a paper some time ago read entitled "Stock v. Corn;" but Mr. Stables, with his paper, had gone a great deal further with the subject than it was on the occasion to which he had alluded. He quite agreed with Mr. Stables in not wishing them to grow more corn, but to grow more of green crops. They should grow more corn on a less area, and more green crops on a less number of acres. Mr. Stables had chosen his subject most suitably to the times, as the present was a time to act with economy. They would find that economy was practised in the counting-house, and in every manufactory economy was most carefully practised. He was quite sure that economy on the part of the farmer was most essential. From the time he got up in the morning he began to give directions where such horses should go, and where certain men should go. His economy began thus early in the morning, and continued up to the time of his going to bed.

Mr. STABLES said, with regard to the scarifier, he would just make one remark. Mr. Walton had the same difficulty as many others had to contend with, namely, the men wanted to be the masters. He would recommend them to do this:—Ask

who was master, he or they. His men had one alternative, either to obey his order or go about their business. He could not see how sheep were to be housed temporarily. Sheep, in his opinion, did not want housing. They had a fleece of wool sufficient to protect them from the cold. With regard to what Mr. Walton had said, he held that nothing could be done unless the land was clean. He had asked what was the time to put in his rye and tares. He would say to him, get the land quite clean first, for if the land was not clean he would not have the tares. Mr. Brown had a little misapplied what he had said about better times coming. He did not think that he said anything about their getting high prices. With regard to what Mr. Wilson had said about ploughing with three horses, he thought that the work done by a turnrise plough more than compensated for the extra horse. With reference to spreading dung as quick from the cart, he thought a man would spread it just as quickly from the cart as he would from a heap.

Mr. HUMPIDGE said there was a difference.

Mr. STABLES said there might be, but it was a very little difference.

Mr. HALL (to Mr. Stables)—You said about having two men to spread the dung from the cart. How much would two men spread in a day?

Mr. STABLES said that was a very difficult question to answer. He (Mr. Stables) would make one remark about the poultry. There was a good price got for their poultry and eggs, and poultry manure was very good, and more than compensated for their trouble of keeping. He had his fowl house cleaned out every day, and the floor spread with ashes, and they made a great deal of manure in the course of a year.

A vote of thanks to Mr. Stables brought the meeting to a close.

THE HEALTH OF CATTLE AS AFFECTED BY THE DIFFERENT SYSTEMS OF LIQUID MANURING.

The agricultural public lie under many obligations to the medical profession for the assistance afforded every now and then relative to the health of cattle; and at the present time we have to thank Dr. Cobbold and others for their invaluable researches in Helminthology. There is no one fact in natural history that has been more satisfactorily determined both from experiment and observation than the liability of cattle to be affected with intestinal and other worms, when fed on certain kinds of food, or feeding-materials of a certain quality; and the deteriorating consequences that follow sheep-rot or flukes in the liver may be quoted as one of the most familiar examples—one, too, that is applicable to ourselves as well as to our domestic animals. There are, however, many other examples whose historical and physiological details are not so well understood even as sheep-rot itself, little as we know about it, but upon which the above and other medical writers are at the present time throwing much fresh light; so that there is reason to hope that the general body of farmers will soon become sufficiently acquainted with the subject so as to be able to prevent the growth of these parasitical pests, and thus preserve their live-stock in a more profitable state of health than is at present experienced.

The question which we purpose discussing in this paper is the effect produced on the health of cattle when fed upon the produce of different systems of liquid manuring, including the old system of irrigation or water-meadows, sheep folding, the application of town-sewage to land, together with the liquid-manure practices of China, Holland, and other foreign countries.

There cannot be a doubt that the flooding of land in warm weather or during the heat of summer with river-water or the sewage of towns is calculated to promote the growth of a vast variety of insects, and that a large number of these are led by instinct to prey upon and infest cattle, and even the human race, in more ways than one. But before entering upon the details of the proposition thus enunciated and involved, it may be as well in the first place to call in question the soundness of the theory now too commonly taught, that our own bodies and the bodies of our cattle are the natural grounds for the pro-

pagation of these parasites, for the order of creation at the beginning of time, as regards the present inhabitants of our globe, proves the contrary, at least so far as man himself is concerned, and also our domestic animals. In other words, the parentage or progenitors of the flukes that now infest the livers of sheep, and of the bots and worms that are found in the intestines and flesh of animals, and of man himself, existed before the sheep, ox, and man existed, and it would be absurd to suppose that this prior existence was not natural. The one half of the lower creation may have preyed and lived upon the other half, but that is no valid argument for concluding that because flukes are now found living in the livers of man and beast, they were consequently at the beginning created in the livers of man and beast, *i. e.* man was created with flukes in his liver! or that Adam was created with worms of any kind in his body! or that the sheep was at first created with flukes in the liver! and so on. All such absurd doctrines in natural history must be tossed to the winds as out of date a century at least.

It will no doubt be said, in reply to this refutation, that the curse pronounced upon creation on the fall of man gave a new nature as it were to these parasites, and that ever since man and beast have been infested by parasites of the kind in question, consequently that the new order of things must now be considered the natural one, so that the primitive rule of paradise has become the exception.

Into a speculative controversy of this kind it is not our purpose to enter on the present occasion, and therefore we shall concede, for the sake of argument thus far, by taking things exactly as they now are. But the intelligent reader will readily perceive that this concession is not assuming that the primitive law of Nature has been abrogated, but the contrary; for, granting that it has become the exception, it still exists, and therefore the parasites in question may propagate their species in certain localities out of the bodies of man, sheep, and black cattle, in perfect harmony with the laws of their nature. In point of practical argument, this is the grand question of questions, that to which we wish to turn special attention; for, if flooded grass-land, or stagnant shallow water in which vegetation and the decomposition of vegetable matter

abound, is the natural habitation of flukes and the other parasites, according to the primitive law that parasites now infest our cattle under the existing order of things, then it is manifest that the application of sewage to grass-land, on the flooding principle, involves all the apprehensions to which Dr. Cobbold and the medical profession are now turning our attention; and consequently, that the more scientific, artificial, extensive, and sounder established practices of China, Holland, and other places, should be followed by the British agriculturist—of course, under all the improvements involved in vastly superior chemical and mechanical appliances.

We are not an alarmist under any circumstances, and, therefore, while we keep closely in view the more enlightened liquid-manure practices for future adoption, we at the same time advocate the more practical doctrine, viz., *to the land with the sewage of towns on the flooding principle, if a better system cannot be carried into immediate effect.* According to the old proverb, "Rome was not built in one day," and so is it with the progress of improvement in this as in every other branch of agriculture. We get to the top of the ladder step by step: some clever people, it is true, go up two steps at a time; but for all that, the step by step folks are never far behind. Indeed, it may safely be said that the single step is the safest practical rule, and to this rule the successful utilization of sewage is no exception.

Such being the peculiar position of things, the practical question resolves itself into the best plan of preventing the growth of parasites in our sewage-flooded meadows, and in the bodies of our cattle. Granting that sewage-flooded meadows form a natural habitat or breeding-ground for those parasites that infest our live stock, yet certain physical conditions are necessary for certain species of parasites in order to enable them to multiply; such being the natural requirements, it follows that if we can by artificial means destroy those requirements, we at the same time prevent the propagation of the whole brood of parasites that now infest ourselves and our cattle, a brood which at the present time is giving rise to grave apprehensions in the minds of not a few economists.

The work of prevention in question has reference, firstly, to the best method of applying sewage to the land on the principle of gravitation, or flooding, so as to keep down the propagation of certain parasites, whose ova are presumed to be in the sewage, to a minimum; and secondly, to the best method of cropping the land thus manured, and consuming its produce, so as to prevent our cattle from being affected with worms, or to prevent a lax condition of the tissues and a morbid state of the fluids, calculated to promote the growth of worms in the bodies of our cattle.

Into the details of these two practices we cannot go, as they form two separate and distinct subjects that would require two correspondingly different headings to do them justice. All, therefore, that we can say on the first subject is briefly this—that if live ova are in the sewage, or present in the land to which water or sewage is applied, and if that water or sewage is allowed to stagnate under the heat of the sun, so as to supply the natural liquid conditions necessary to their being hatched, then the upshot need not be told; for, in a very short period of time, such conditions will soon give birth to a brood whose number the best arithmetician dare not attempt to calculate. These, again, are presumed to enter our cattle in various forms—along with the vegetable produce of such lands; or by attaching their ova to the coats of animals, who take them into their stomachs by licking the parts; or by puncturing the skins of animals, and depositing their ova; or by entering the respiratory organs with the foul air inhaled, and so on.

Such being the facts of the case to which we propose confining our observations, they may be resolved into the following three practical questions, viz.:

First: Can the sewage of towns be so doctored by chemical means as to destroy the ova of the parasites in question, or otherwise neutralise its tendency to produce them, or its fitness to support life—granting that the conditions to hatch the ova are present—without, at the same time, injuring the fertilizing properties of the sewage?

Second: Can the ordinary produce of land, such as Italian ryegrass or meadow grass, which has been manured with town sewage or liquid manure of any kind, on the principle of gravitation, and consequently under less or more stagnation of

the fertilizing liquid, be so mixed with other vegetable matter possessing anthelmintic properties such as would prevent the growth of worms or parasites of any kind in our cattle?

Third: Can plants possessing anthelmintic properties sufficiently powerful be grown, either along with ryegrass or other vegetable product, fit for feeding material for live stock, under sewage culture, or be grown by themselves, and afterwards mixed with the grasses, so as to produce a wholesome diet for cattle?

Generally speaking, we aver that an affirmative answer may safely be given to each of these three questions. No doubt, on entering upon the practical details of each, many qualifications may be necessary; but, in this respect, they are only similar to all other questions in agriculture of a kindred character, in not a few of which the exception becomes the rule, owing to the many imperfections attending the best-performed manipulations of the agriculturist. Thus how often do we find two neighbouring farmers exerting all their skill and professional talents to carry out into practice identically the same theory! yet results prove that very great differences must have existed in the more minute details of their respective practices; in other words, the two practices, in point of fact, were different, otherwise the results of both would have been similar. Fallen Humanity is even prone to father Nature, with all her shortcomings; but, when brought to the clear light of day, her illegitimate offspring leave no doubt in the mind of the observer as to their true parentage; and it may safely be added that sewage-farming will be more than ordinarily prolific in this respect. But in doctored sewage, or the land to which it is to be applied (for both problems are included), or the produce of land that has been manured with sewage, or in growing new products, the practice is, by hypothesis, in each case assumed to be successful; otherwise it falls to the ground as an abortive experiment. If, on the other hand, the reader hesitates to subscribe to an affirmative answer to the first question, then the Chinese, Flemish, and other liquid-manure practices may be quoted, in which insectivorous life is destroyed, although the produce may by over-luxuriance be etiolated, and hence liable, under certain conditions, to produce a relaxed state of the tissues, and eventually worms, intestinal, skin, and other maladies of a kindred character.

But we need not go so far as China, or even the continent of Europe, in search of counter-examples; for the old familiar practice of sheep-folding affords tangible evidence to the contrary—that the fresh droppings of sheep and neat cattle may be applied to land without producing worms, even when the animals themselves are greatly infested with them, such as sheep turned into a field of fallow when under the last stage of sheep-rot. In the second and third examples, equally strong practical evidence might be quoted in support of the general conclusion, did our limits permit.

It will no doubt be said, in answer to the old practice of sheep-folding, that the droppings are not doctored by chemical means, and hence that it is not applicable to the proposed practice in question. But the objection thus raised is easily refuted; for Nature supplies the chemical means in this case, which art or the farmer is presumed to supply in the other. The reader who has not studied the chemistry of the parasitical life in question from a practical point of view, must be reminded that very little change is necessary to produce very important results; for if a nostrum is applied of a repulsive instead of an attractive nature, the upshot will be no parasites, but, *vice versa*, an abundance if the nostrum is attractive. Taste and smell have been pronounced by the highest authorities in this branch of science to be two chemical processes; and it is a well-established fact that these two processes, taste and smell, have much to do in the propagation of the parasites in question. We readily grant that the practice involved in this "repulsive doctrine" is surrounded with many difficulties; but in conceding this, we must also, at the same time, remind the reader that such difficulties do not stand in the way of discovery in chemical science. In point of fact, they are, on the contrary, the finger-posts that indicate the line of progress—"necessity being the mother of invention."

The general conclusion to be deduced from these observations is obviously not so unfavourable to the application of town sewage and other liquid manures to land, on the principle of gravitation and flooding, as not a few economists at the present time are apprehensive, provided the practice is properly

carried out in accordance with the whole of the requirements involved, as demanded by the health of our cattle. In other words, under properly improved management, the health of cattle may be preserved; whereas under the old, antiquated, and objectionable routine the contrary will be the inevitable result. Over-luxurious and etiolated herbage, produced under the Chinese, Flemish, or any other system of manuring—as an

extra dose of guano—will produce bad health and worms; so that the differences between certain practices that are inimical to the health of the farmer's live stock involve a practical problem not very easily solved in accordance with the demands of successful farm practice. The two practices may, in point of fact, be followed by two different farmers with the most opposite results. * * *

MALTING BEANS AND PEAS FOR CATTLE.

[We have been requested to publish the subjoined correspondence.]

[COPY.]

The Hall, Attleborough, Norfolk, April 20th, 1865.

To the Right Hon. the Chancellor of the Exchequer, &c., &c.

SIR,—The farmers have undoubtedly a right to feel obliged to the concession made in respect to malting corn for cattle. It has been proved beyond doubt, if properly managed, to be a most valuable condiment with other food, especially for sheep, and were it not for the indispensable restriction of grinding it would be more so, and there would at this time be a very large quantity used for lambs, with succulent grasses, especially beans and peas. It has been my opinion for many years that malting for cattle would one day become an art and a study, if the trade could be thrown open; and the more I learn from practical results the more I am convinced of the fact that brewers' malt is not the essence of perfection for feeding purposes. I was very anxious to have tried a few score of beans and peas malted for my flock (about 1,000 head), but the grinding renders the trial as valueless as that published by the Board of Trade; and they have now only to seek for unbiased information to test the truth of my assertion. My intention was to have had these beans and peas slightly sprouted, and not too highly dried, and unground; my object being to render them brittle, easier for mastication, lighter for digestion, thereby more nutritious and not so heating as the raw article. The farmers and the public will shortly know their doom. But surely if your plans are not sufficiently matured to give us total repeal (from information derived from the Inland Revenue Office, which appears to take especial interest in the malting and brewing monopoly, if their report, as published by Mr. William Gardon, is to be taken as a guide) this session, arrangements might be made to grant the free and unrestricted use of beans and peas. I am not aware it could in any way interfere with the revenue. No doubt the present style of English beer is a compound difficult to define, but I have not been able to ascertain beans and peas form any part in the concoction. If it would not be considered presumption, I should like to know, in the event of the malt-tax not being repealed for a season, whether there could not be some arrangement made relative to the unrestricted use of beans and peas for feeding purposes. Many of my brother-farmers are anxious to know your views, and if we are likely to have a chance given us to compete against the extraordinary importation of fat cattle—a most serious consideration to every grazing district. I am a farmer, and have been somewhat largely concerned in landed property in several counties, for thirty years, as agent and public valuer, and the sentiments I have expressed are entertained by a very large majority of the tenants. Agriculturists seldom or never unite or interfere with state or political matters; but the severe pressure that now hangs over them, and indeed every branch of their calling, has aroused a strong feeling of suspicion that their passive, and, I may add, loyal demeanour, has acted prejudicially against them, and that the hackneyed phrase, "the farmers' friend," has been a snare and delusion, and it is now time they should put their shoulders to the wheel. I have repeatedly been told you are ever ready and willing to hear all sides, and I must plead that as my excuse for thus trespassing on your valuable time; and I trust you will be able to arrive at a just verdict, and by judicious legislation place the farmers in the position to pay their full quota of the incometax; for it is contrary to common sense and reason for them to pay only 3d., if their present condition is sound, while the rest of the community are charged 6d. We live in a free country, and every Englishman ought to contribute willingly towards the support of its liberal institutions, but I think it is admitted on all sides that the malt-

tax is unequal, oppressive, and not in accordance with free trade principles; but in the same breath we are obliged to add, "how are we to spare the money?" It is an old adage "where there's a will there's a way," and I hope you will be able to solve the problem and satisfy yourself—some parties will be sure to grumble. The malt-tax I presume realizes, in round figures, £5,000,000 net. I trust you will shortly be able to announce you have £2,000,000 to spare towards its repeal, leaving £3,000,000 to be made up. Select £10,000,000 of taxes, to which add 5 per cent. so long as required. That will raise £2,000,000, which, if the taxes are equal now, no one can complain of. Draw out a graduated scale for raising £1,000,000 under Mr. Gardon's plan, or some modified adjustment, and the difficulty is solved in the opinion of one who begs to subscribe himself, with great respect,

Your most obedient and humble servant,

THOS. FISHER SALTER.

[COPY.]

*Inland Revenue, Somerset House, London, W.C.
2nd August, 1865.*

SIR,—On the 21st of April last, the Chancellor of the Exchequer referred to this board for their consideration a letter you addressed to him on the subject of malt for cattle-feeding purposes. This board regret the delay that has taken place in their reply to your suggestions, but much time has been occupied in the experiments that were necessarily required. I am now to inform you that there will be no objection to your using unground malted beans and peas, or barley malt crushed under rollers, provided the linseed or linseed-cake be first mixed and crushed at the same time with it, and that samples pass the examination at this office; unground barley malt cannot, however, in the interests of the Revenue, be allowed to be used for cattle-feeding purposes.

I am, Sir, your obedient servant,

"WM. CORBETT, Sec."

[COPY.]

The Hall, Attleborough, August 4th, 1865.

SIR,—I beg to acknowledge the receipt of your letter of the 2nd August, relating to malted corn for cattle, for which I am obliged. With regard to beans and peas, if I understand your letter correctly, there are no restrictions; therefore, I can have them malted at any malt-office nearest to my occupation free of duty. The restrictions on barley remain the same, with the exception that it may be crushed under rollers with the linseed, instead of being ground.

Allow me to remain, Sir, yours most obediently,

"THOMAS FISHER SALTER.

"W. Corbett, Esq."

[COPY.]

Inland Revenue, Somerset House, London.

SIR,—Your letter of the 4th instant, addressed to the secretary, having been laid before the Board, I am directed to acquaint you that peas and beans may be malted, duty free, for cattle-feeding, without any restriction, except that the process must be conducted at an entered malt-house, and that the maltster must give the local officer twenty-four hours' notice before he steeps the peas or beans, and keep them at all times separate from grain or malt in the malt-house. Barley or other grain, malted duty-free for cattle-feeding, remains subject to all the established restrictions, except that the malt may be crushed under rollers with the linseed or linseed-cake, instead of being ground; but a sample of the mixture must be submitted for approval.

I am, sir, your obedient servant,

"ADAM YOUNG."

EXPERIMENTS IN CATTLE FEEDING.

Last spring, Mr. A. Smith, Stevenson Mains, East Lothian, who has given much attention to the fattening and rearing of stock, having a pretty large quantity of potatoes on hand about the time when he was beginning to feed off his cattle, thought of trying how they would thrive on a potato diet, with the usual quantity of oilcake. The cattle were accordingly fed off with the potatoes, and thrived so well on them that he resolved on testing the qualities of the root still further this season, by feeding from first to last entirely on potatoes. He at the same time, for his own guidance in carrying out the pulping system, to which he is a convert, made a separate experiment to test its value as against feeding in the ordinary way with sliced turnips. A lot of cross-bred shorthorn stirks, rising two years old, were bought by him at the Linton October market last autumn, and divided as equally as possible with regard to condition, size, and so forth, among three courts. The lot numbered twenty, six of which were to be fed on potatoes, seven on pulped turnips, and seven on sliced turnips, with the usual allowance of straw in each case—the pulped-fed cattle getting theirs chopped. From the moment they entered the courts, up to the month of March, when the whole of them for the first time, and in the same proportion, got oilcake and barley-meal to finish off, the cattle were kept exclusively to their own kind of diet.

A very short time served to show which was the most nutritive article of food. Almost from the first the potato-fed cattle took the start of their neighbours, and, to use a racing phrase, were never headed, but came in at the finish a good way in advance of the others. They took to the potatoes with the greatest relish, and never gave the slightest indication of "hoven" all the time they were being fed on them. In fact, no beasts could have given less trouble or anxiety from the day they were put into the close till they were taken out in the early part of May—a period of about seven months. While the experiment was thus satisfactory with regard to what we may call the No. 1 court, it was not the less so as respects No. 2—the court containing the cattle fed on pulped turnips. These also, almost from the beginning, evinced a superiority over their neighbours fed on the sliced turnips. They were decidedly in better condition, and brought more money—perhaps the best test of all that they had been better fed. The cattle, as we have said, when they went into the courts, were placed as nearly as possible on an equality, and their difference of condition at the end of the experiment was solely due to the difference of feeding. The average price obtained for the lot was £17 5s. each. They were sold privately, the value put on them by the purchaser—a dealer in judgment—being as follows: No. 1 court, £17 15s. each; No. 2 court, £17 5s.; and No. 3 court, £16 15s. In other words, the potato-fed cattle brought 10s. a head more than those fed in the ordinary way.

The value of the experiment consists of course in the expense of raising the different lots, because if No. 3 court were fed off cheaper than No. 1 court, no inducement is offered to make any change from turnips to potatoes. This point can be satisfactorily answered. Each of the courts was supplied with a daily allowance of turnips carefully weighed or measured, and it was found that while in the case of the No. 3 court the seven cattle consumed 11 cwt. of turnips per diem, those in No. 2 court were well and better fed with 9 cwt., or 2 cwt. per day less. This was a direct saving in the cost of the turnips; but it also saved, a matter of some consequence, the expense of carting the extra quantity from the fields, which could be much more easily and profitably eaten off by sheep as they lay in their drills. As a set-off against this, there is, no doubt, to be placed the cost of the pulping; but this is not a very serious matter. Mr. Smith does not employ steam for the purpose at Stevenson Mains, but has a one-horse power machine, which he finds answer extremely well. The amount of work which it gets through is large, amounting to about 3 tons per hour, amply sufficient for the wants of a pretty large number of cattle we should fancy. There is also the wages of the girl who attends the pulping machine when it is in motion; but making every allowance for these items of expenditure, Mr. Smith is quite convinced, from his experience of the system, that it is, when properly conducted, in every way more profitable to pulp than to give cattle the turnips simply sliced. His experiment this year seems to prove that not only can they be fed on a less quantity of turnips, but that they bring a better price when fat than the others.

Taking the value of a ton of turnips at 10s., the average weekly cost of feeding the No. 2 cattle amounted as nearly as possible to 4s. 6d. per head, while the No. 3 cost about 1s. per head more. The calculation can easily be made, and will be found as stated. But the potato-fed cattle show a considerably greater saving. The courts were put under the charge of a careful and experienced cattleman, whose instructions were to note down exactly the amounts consumed in each close. From the book which he kept, we find that the six cattle in No. 1 close only consumed a weekly average of about 15 cwt. of potatoes, which at 25s. per ton gives 3s. 1½d. as the expense per week of feeding each beast, and feeding it £1 per head better than with food that costs 2s. 4½d. more money weekly. It is also to be remarked that the potatoes used were unmarketable, in so far that the firsts and seconds had been selected from them, and were only available for the starch mill or for feeding purposes. So satisfied is Mr. Smith with the result of his carefully-conducted experiment in potato-feeding, that he intends continuing it next year on a larger scale. He has no doubt as to its being the most profitable, as it is undoubtedly one of the easiest, modes of fattening lean cattle for the market.—*Haddington Courier*.

THE CULTIVATION OF THE FINER KINDS OF BARLEY.

The great and permanent improvement which has been made upon agricultural produce of almost all kinds by a judicious and well-conducted system of culture, must be too obvious to even the most careless cultivator of the soil to require any lengthened comment in these columns.

Above all, the great and still increasing attention which has of late years been paid to the cultivation of the different varieties of the wheat plant is a matter of no small congratulation to the farming community. The unique and somewhat remarkable collection of the different varieties of wheat exhibited recently in Edinburgh by Mr. P. Sherriff is at once a proof of the great interest taken in the matter, and the success which has already attended the raising of new and improved varieties. So far as the wheat plant is concerned, farmers have now such an extensive assortment of red and white,

bearded and plain kinds to choose from, that no one need have any difficulty in making a selection of seed likely to suit his particular soil. Indeed, as not unfrequently happens when there are too many good things to choose from, there may be some difficulty by-and-by in coming to a decision at all among such a rapidly-increasing and rapidly-improving collection of varieties.

As so much has been done for the improvement of the wheat plant, which unfortunately for wheat growers is not bringing a very remunerative price at present, and in all probability is not likely to bring a high price soon, it has been suggested to us that something might be attempted in the same way for the improvement of the other cereals, and especially of barley, which can still be cultivated with less risk and more profit than wheat.

With regard to the improvement of the quality of barley, the matter is one of so much importance that it is surprising it has not attracted more notice, and been entered upon at least with nearly as much spirit as has characterised the operations of the gentlemen who have brought the wheat plant to its present condition. Now, however, that a little more dependence will in all likelihood be placed upon the cereal, it may confidently be expected that more attention will be paid to its cultivation; and the present time seems a favourable opportunity for bringing the matter under the consideration of all whom it may concern, with some chance of obtaining a hearing.

In the cultivation of barley, as well as of the other cereals, there is no doubt that some attention must be paid to quantity as well as to quality. In dull times such as the present, or indeed in any contingency of markets brisk or dull, a few additional quarters to dispose of will always be a matter of no small value to the tenant farmer.

In the case of the finer kinds of barley, however, quantity may with little hesitation be sacrificed to quality; and the improvement of the quality is at present the great desideratum. Maltsters and distillers are of course the principal buyers of barley, and there is no way in which its quality can be better tested than on the malt floor. The wide difference which is found by maltsters between almost similar samples of barley, after they have been subjected to this test, is such as would scarcely be credited by those unacquainted with the malting process. It is particularly with reference to this phase of the subject that we at present advocate the necessity for a little more attention being paid to it.

The fine Norfolk barley, for instance, when placed upon the malt floor, will be as far advanced for malting purposes in the course of twelve days as the common barley grown in East Lothian or Fife will be in eighteen or twenty days. This of itself is of no mean importance to the maltster, especially if his accommodation is limited and his orders are pressing, as it gives him the advantage of having three floors in the time taken by two. This, however, is a small matter when compared with the difference after it passes from the kiln. In the case of the best English barley, the saccharine or sugary matter becomes so dry, free, and pulverous in its nature, that it may be taken and rubbed between the fingers like whiting or flour.

The result of this is that, when it comes to the mash and wash-tubs, there is little or no sediment left behind. The whole strength, indeed, of the grain has been extracted, and in less than half the time required for the common Scotch variety.

The more common barley never acquires this free and pulverous character. There is always somewhat more of a glutinous nature about it, and the mash is full of hard granular particles which look like a sprinkling of rice, and which, of course, never yield the saccharine matter contained in them. The process, therefore, is not only a much more tedious one in the case of the coarse and common varieties, but the result is also much more unsatisfactory. There is not only nearly double the time consumed in the various operations, but there is much more loss in the matter of refuse.

There is no doubt that there is much, very much, in soil and climate which must be taken into account in producing superior quality. With all due allowance for these, however, there does not seem any good reason why East Lothian should not produce as fine a quality of malting barley as the eastern coast of England. There is not such a wide difference between the two localities but that a much nearer approximation at least might be made. Whether this might be best effected by a regular and systematic change of seed from these more favoured localities, or by cultivating and endeavouring to improve—as has been done so successfully with the wheat plant—the finest of the barley at present grown in the district, is a subject for more mature consideration; but there can be little doubt that a regular changing of seed would have some effect upon the produce. The sample might degenerate in the course of a year or two; but granting that it does so, there is still the same course open, namely, to change the seed again. In this way, if in no other, a nearer approach in quality than there is at present to the finest English barley might be kept up, not without a little trouble certainly, but a trouble which would ultimately bring its own reward in the higher price obtained for a better article.

The subject is one which should be taken up by all whose farms are adapted for carrying it out, and more especially at the present time, when there is so much necessity for "making the most of it."

SALE OF LONG-WOOLLED RAMS.

Messrs. Salter, of Attleborough Hall, held on Thursday, Sept. 1, their fourth annual sale of Lincolnshire tups, descendants of the Biscathorpe flock. The reputation the Messrs. Salter's sheep have already acquired in this neighbourhood, in addition to the adaptability of the improved Lincolnshire breed for crossing with the brown and black-faced ewes still in favour with the Norfolk flockmasters, was an attraction sufficient to bring together upwards of 150 of the most business men and largest breeders in the county. This large company of beginners, as the Messrs. Salter, it may be said fairly, term themselves, augurs well for the future history of the Attleborough Hall flock. And when it is said that the flock at present is only 200 stock ewes, and 100 shearlings were brought to the ring for sale and letting, it will be farther believed that this flock is full of promise. Of these, 80 were sold for £538 5s., or only 35s. under 10 guineas each. The remaining twenty were young and twin sheep, or promised to grow into good two-shears for next year. When it is further said, as one may judge, that only fifteen male lambs of the last year's fall were withdrawn for wethers, it will be allowed that the Messrs. Salter have, in the drier climate of East Norfolk, fairly distanced many breeders of these sheep in their native county. To have half as many shearing tups as there were ewes lambed down brought to the hammer as shearlings, in fine working condition, and all nearly equal in value, with the few good exceptions that always arise, according as the breeders requiring them may think them adapted for their ewes, is certainly an accomplishment that few men in the fourth season can congratulate themselves upon. This, however, has no doubt arisen in a great measure from the Messrs. Salter not having flinched at the first outlay, nor at trying to improve the character of their flock by successive purchases of

the best sheep they could find—that is, so far as the tups they have annually purchased were thought to be suitable for the particular ewes they wished to improve upon.

In regard to the long wool retaining its lustre and quality of fibre in this drier and warmer climate, we may say that we have never seen more uniformity of fine qualities; and this opinion was confirmed by Mr. W. Neal, of Ely, who has bought the Messrs. Salter's for three years, and who said in a letter to Mr. Simpson, the officiating auctioneer, on Thursday last: "I have said to many friends it was the best parcel of wool we have sent to Bradford this season. The party to whom it was sent say the same, and that it is very much superior to the bulk of wool grown in our district." Some of this the Messrs. Salter attribute to their practice of spreading straw over the land; for, as they say, much damage is done to long wool by its being frozen to the ground in winter, for the sheep on rising break some and stretch more to an extent, that it afterwards grows deformed, becoming "knotty," a defect which is very injurious and therefore watched for by buyers. But from the sheep having straw to lie on, instead of bare soil or rooted grass, on their rising the loose straw sticks to the sides of the sheep, and falls off soon after from the heat of the body or the sun melting the ice by which it was attached. This, however, has nothing to do with the lustre, and, so far as we could perceive, this important quality is not in the least diminished.

Among the gentlemen and buyers on the ground were, W. Bagge, Esq., M.P., for West Norfolk, and C. S. Read, Esq., M.P. for East Norfolk; Captain Caldwell; Von. Staveren, from Holland; Messrs. R. Leamon (Whitwell), S. K. Gayford and T. and H. Gayford, F. Edwards (Barnham, Suffolk), W.

Jelling (Thetford), and C. and —, Jelling, H. Aylmer (West Dereham), W. Elliot (Rushford), H. Wood (Merton), J. Turner (agent to the Marquis of Bristol), W. Biddell (Hawstead, Suffolk), Wells (Haverland), Reeve (Snettisham), G. Barton, T. Matthews, jun. (Tompson), J. Gates (Brandon), A. H. Bartlett (Thetford), J. Peto (Barningham, Suffolk), &c., &c.

The prices the sheep made were of a very uniform character, which indicates the "family likeness" of the flock more than if a few higher prices had been made, and these had brought the average up to the 10 guineas. The highest price was £20, which was given by Mr. Edwards, who bought five others at prices between £8 10s. and £12 10s. Mr. Turner bought four for the Marquis of Bristol at prices from £10 to £12 10s. These are for putting to pure Southdown ewes, which shows the change which is undergoing the minds of fashionable breeders before the high prices of mutton and long-wool. Mr. Gayford of Wretham bought two at £12 and £9 each; Mr. Seamon three at £10, £10 10s. and £11 respectively. Mr. W. Jillings bought No. 1 at £17, and two others. Messrs. J. & C. Jillings bought two each. Captain Caldwell bought one at £14, and one at £13. Mr. Limmer bought 4 at store prices, which varied from £9 to £12 10s. The remainder were sold according to their form and the appreciation they met with by the company. The 20 shearlings that were let made proportionate prices.

Of ram-lambs there were 35, which were let. The first made £9 to Mr. Myhill. Mr. Tingay took two at £7 10s. Several were let at £5 the pair, some at £5, and three at £3 the pair for the season. These of course will return, if they do well, and be some of the shearlings for next year's sale. It is here generally considered that strong lambs, if taken good care of, improve by being used as rams. Lambs are greatly preferred for getting lambs for fattening.

Fifty shearing ewes were offered, as the Messrs. Salter with their neighbours to try some of their breed, as against the brown-faced ones of their own flocks. But only 3 ewes exceeded the up-set price of £3, and these made 63s. and 65s. each.

Before closing this notice of the Attleborough Hall sale, we cannot do less than remark that the system of spreading straw on the fields for sheep to tread in answers as perfectly as we said last spring it promised to do. All the roots are here sown with one ploughing 11 inches deep, and nothing can be expected to look better than they now do. As will be remembered, the quantity of corn fed per acre was about one ton, as the roots were last year so few. Beyond this, no other manure has been used, and on these 11-inch furrows, or rather depth of mould, there are some wonderful mangold, capital swedes, and white turnips, and, for the season, those crops are unusually clean. This may in some measure be accounted for, after the showery weather we have had, from the seed of annuals near the surface after the 11-inch turning-over having had time to vegetate, and were therefore harrowed up at the time of sowing the crop. These roots will be nearly all consumed as before described. About two-thirds will be taken to adjoining fallows, and one-third be fed in some cases on the field for the barley or spring oats. The cartage saved by this practice is of immense importance. The improved condition of the land is, however, of greater importance. The present stubbles will be as usual forked over, to raise out the few roots of twitch that will gather by the end of a course. This is done at the cost of 2s. 6d. to 3s. per acre, and is no doubt the cheapest as well as surest method of keeping land free of this troublesome plant.

Last year the Messrs. Salter were so hard up for feed for sheep that they fed off a piece of lightly podded beans. This makeshift, as it was looked upon at the beginning, proved so advantageous that this year several acres of part bean and part rape or turnips have been sown, and are being fed off together, the ewes having a few rods nightly. By this feed the ewes are clean and healthy, although they are on a piece of sappy after-grass. They eat the stalk and all down close, and the cheapness of this practice must be also greatly in its favour.

There are some other interesting points worth noting, but our space compels us to defer a notice of them.

The CHAIRMAN, after luncheon, having given "The Queen," and "The Prince and Princess of Wales," next proposed "The Army and Navy," coupling the name of Captain Caldwell, who briefly returned thanks.

The CHAIRMAN next proposed "The health of the County Members."

Mr. C. S. READ, M.P., who received a hearty reception, said he saw by the expression of some of their faces that they were inclined to ask why he rose before Mr. Bagge. The East Norfolk election took place a few days previous to West Norfolk; and he, a young man, took precedence of their old and tried friend Mr. Bagge. He could remember that he was a little boy at school when Mr. Bagge was first returned for West Norfolk, and that he then received his first black eye in vindicating the independence of the electors on that occasion. Exceedingly pleased he was to see Mr. Bagge looking so blooming and young, and representing them once more. He thanked them most heartily for the kind way in which they had received the toast of the county members, and remarked that it was one of the greatest honours that had been conferred upon him in being associated with a man so able and so hard-working as Mr. Howes. He would not talk about the cattle plague or politics, or even directly about the malt-tax, but he would say a word upon Mr. Gladstone's "Malt for Cattle Bill." He took his sample of barley, about this time last year, to market, and was bid ninepence per stone for it; but he did not like the idea of paying double the price for the same quantity of Mr. Gladstone's mixture. He therefore kept his barley and bought malt, and, from his experience, he was perfectly satisfied with the result. But what he wanted was, that they should be more accurate; he wanted them to vary the experiment in every possible way, so as to convince Mr. Gladstone that malt food was not altogether a fallacy. His own experience was, that malt should not be used in very large quantities, but that it was very useful as a condiment, seasoning a large quantity of unpalatable food, and thus carrying out the scientific opinions of chemical professors, who told them that it made a large amount of the food they gave to cattle more palatable, more soluble, and more digestible. Seeing so many practical men about him, he asked and entreated them in the coming winter to try a little malt, and give them unreservedly the results of their experiments. There was one little bill passed at the end of the old Parliament, "The Weight by Malt Bill," which was passed for the express purpose of taking off the extreme pressure of the malt tax upon the occupiers of heavy land. In his opinion it did no such thing. They would find that almost every sample of barley from off the light land was coarse and heavy, and he thought the proper title for the bill would be "A bill to grant facilities to the maltster for importing light, bright, and foreign barleys, to the further prejudice of the British farmer."

Mr. BAGGE, M.P., who was also most warmly received, was sure that, in all his excursions through West Norfolk, he had never met with such a reception, particularly in the neighbourhood of Attleborough. Generally speaking it was frost and snow in that locality; but he concluded that, being under the hospitable roof of Mr. Salter, one side or the other would receive him thus heartily. That was the first time he had ever done himself the honour of attending Messrs. Salter's meetings, but he trusted that it would not be the last. He again thanked them for the warm reception they had given him, and resumed his seat amid expressions of favour. He, however, again rose, and proposed the health of the Chairman.

Mr. S. K. GAYFORD, in returning thanks, said he was much indebted to them for the kindness evinced towards himself, and he thought they would agree with him that the stack-yards of West Norfolk were seldom, if ever, worse filled and in worse condition than they were this year. When they looked round that well-filled barn, and stepped out upon the green hills, and saw that the sheep-pens were also well filled and that the animals were of good quality and in fine condition, they would say that there was never a rule without an exception. He had known a good deal of Mr. Salter's transactions, and that he had spared no pains and expense to bring his sheep to perfection; and he was much delighted to see such a company present, because he felt certain that there must be a good sale. If there were any present who had purchased Mr. Salter's sheep, and mixed them with tups of a different breed—whether two or three of Mr. Salter's tups with two or three of any other breed—and had not produced a flock of lambs such as they had wished, they must not be disappointed, because he felt that the result was certain. Every flockmaster's object ought to be to select his ewes so as to get

them as much alike as possible, never losing sight of quality, a fair quantity of wool, and perhaps just now a large quantity of wool. Some at present might be large purchasers of beasts, and it was certain that every man present would put his hand on his beasts to know the feel of the skin; but there was just as much in the pelt of a sheep as there was in that of a bullock.

Mr. C. S. READ, M.P., in proposing the health of "The Flockmasters," associating with the toast the name of Mr. Bartlett, was happy to say that at the present time wool and mutton were fetching capital prices.

Mr. BARTLETT feared that he should cut a very poor figure with many of the large flockmasters around him. He congratulated them on their election of members for the county, and said that the acquaintance of the tenant-farmers was as deserving of cultivation as that of the landlords. Having complimented Mr. Salter upon his excellent show of sheep, he thanked them for the honour paid him.

The CHAIRMAN then proposed "The health of Messrs. Salter."

Mr. SALTER, in responding on behalf of himself and brother, said they were proud to see so many present, and they should be proud to meet them for years to come. He felt that they must have given some satisfaction to his friends and neighbours, else he should not have increased his number of visitors so largely; and assured them that he had done his best as a farmer, to produce such animals as he believed were required by them. It was his endeavour to combine wool and mutton, to get Lord Walsingham's Down carcasses under a long-woolled fleece; and he thought, that in the lot of sheep he exhibited that day, that was nearly accomplished. Nothing, he continued, should be wanting on his part to merit a continuance of their support and confidence, and he hoped that none would be disappointed in any animal they might purchase or hire, adding that no reserve bid had been put upon any animal, and that 100 out of 115 which he had bred would be put into the ring for competition. He concluded by proposing "The Strangers," coupling with the toast the names of Messrs. Biddell and Turner.

Mr. BIDDLE, after expressing the pleasure he felt in being present at that meeting, said he had the cattle plague upon his farm, although he had not purchased any animals for eight or ten weeks, and although his cattle had not been within 400 yards' distance of any other animals. Whether the beasts became infected through the atmosphere, or the disease was conveyed to them by those pests, the flies, he must leave to those more learned in such questions; but he recommended all, if they would not be the losers in a pecuniary point of view, to join associations which had for their object the relieving of the losses of their neighbours. He congratulated them upon the opportunity they had of replacing the bullocks by a kindlier and more profitable animal; for, as far as he was a judge, they had a good article in Messrs. Salter's sheep, which were well adapted to the purpose to which tups were applied. It was a prevalent opinion that the disease in cattle affected beef-eaters, and he, therefore, recommended them to turn their attention to the growth of mutton.

Mr. TURNER also responded.

Mr. WOOD proposed "The health of the Wool Buyers," coupling with the toast the name of Mr. Neal, of Ely.

Mr. NEAL said he had purchased the wool of Messrs. Salters' sheep for some years past, and pronounced it to be of superior quality, and in very much better condition last year than he had previously known it. He sold it to a gentleman in Yorkshire, who stated that it was the best parcel he had purchased that season. There was no doubt but that the long wool commanded the higher price, and he advised them to cultivate it, recommending Messrs. Salters' sheep as fitting animals for producing the staple required.

Captain CALDWELL proposed "The health of Mr. Simpson," to which Mr. Leaman added the name of "Mr. Bacon."

Mr. SIMPSON returned thanks on behalf of Mr. Bacon and himself. After alluding to the fine quality of the sheep he had to offer that day, he concluded by proposing "The Ladies," and associating the name of Mrs. Salter with the toast.

Mr. BAGGE was taken by surprise to hear Mr. Simpson conclude by proposing that toast, as he had reserved it for himself, and had intended, in proposing it, to apologise for the absence of the Hon. T. De Grey, who should have proposed it, but was in the North shooting grouse. He hoped that he would be present next year.

SHEEP SALES AND LETTINGS.

MR. DAVY'S LETTING.

The Owersby rams of this year presented, on Monday, Sept. 4, a marked and very commendable improvement over last year: indeed, considering this is only the fourth season of Mr. Davy's special attention to ram-breeding, his progress in hitting off the public demand does great credit to his judgment and energy. Owing to the high price of wool and mutton, breeders have been determined in securing sheep for stock which promised to produce great fleeces and carcasses that would pull down a heavy scale. How far this is right in principle we shall have occasion to argue more fully, in connection with other flocks, in the descriptive notices we shall have to give below. While, however, Mr. Davy's are of this great size there is every requisite quality in his breeding-ewes for him to warp his sheep when he sees fit to form and sizes which, we will at once say, we consider more lasting and reliable for producing great weights of wool and mutton per acre. As the fashion goes, Mr. Davy is undoubtedly successful; for while it takes some years to get a fashion fixed in the public mind, it takes longer to change the views of which a fashion may be composed. Agriculture generally, and sheep-breeding in particular, are not exceptions to this action of the human mind.

By the prices we have to record, it will be at once seen that Mr. Davy had every reason to be pleased with the largely increased company which attended his auction-letting, and also that the bidders were well pleased with Mr. Davy's sheep. The large number of 120 rams, viz., 70 shearlings, 36 two-shear and 14 three-shear, certainly composed a very imposing and attractive show. Their great size, heavy coats, and masculine heads (the skin of the latter organs being generally of the admired blue tinge) caused more than one ram-breeder and other good judges to speak of them, as a whole, as being in every way suited to the wants of the day. But with the figures we have before us further comment on our part would be superfluous.

The 70 shearlings let for £1,028, or, within a penny or two of an average of 14 guineas each; the 36 two-shear, and the 14 older sheep bringing the general average for the 120 to £13 1s. 6d. each.

The first strikingly noticeable sheep was No. 8, an animal of good form, legs short and true, and he carried a fleece of good weight and fine quality. This sheep, in our opinion, will turn out to be as good an animal as any on the ground—particularly if the present fashion should change sooner than it at present promises to do. He was taken by Mr. Dudding, of Garthorpe, at £26. The next one was another excellent sheep, and, being larger and of good form, with fine pelt and bold head, as well as of a fat nature, he caused a good bit of spirited competition and was soon let at £76 to Mr. Garne, which adds additional interest to the high price he made, as this name will be recognized as one familiarly known in connection with the Cotswolds. Mr. T. Cartwright, a ram-breeder, hired the next one, at 31 guineas: this was a good thick sheep, of fair form, with a peculiarly pleasing expression of countenance upon a good bold frontispiece. Mr. John Clark took No. 15 at £20, Mr. S. Hobbins No. 17 at the same figure, No. 19 made £31 to Mr. Mayfield for the Dogdyke flock, Mr. Dickinson took No. 22 at £31 10s., Mr. E. Davy took No. 24 at £17 10s., Mr. Byron took No. 28 at £36, Nos. 32 and 34 made £19 and £20 to Mr. Haseltine, No. 33 was taken by Mr. Codling at £30, Mr. Garne took another, No. 40, at £18, No. 42 was taken by Mr. Bartholomew at £18 10s., Mr. Richardson took another at £18, and Mr. Shrapley one at the same price. In the older sheep, Mr. Chatterton took No. 75 at £25 10s., Mr. Kirman No. 90 at £19, No. 110, a three-shear, was taken by Mr. T. Brown at the good price of £40, Mr. G. Clarke No. 112 at £24, Mr. R. C. Howard No. 113, a compact sheep of good quality, at £23, and Mr. Marshall No. 118 at £18. These few quotations will, it will undoubtedly be thought, fully bear out our remarks on the successful manner in which Mr. Davy has pursued this branch of his extensive agricultural business.

This notice of the Owersby flock would be incomplete unless we made some reference to its clip of wool. There were 950 fleeces, and their net weight was 375 tods. As may be judged, a large number of the fleeces were only two to a tod, and most of the rams cut considerably over the 14lbs. The whole clip

—ewe, tup, and shearing together—was sold on the 14th of June last at 60s. per tod. When these figures are carried out, and it is found that this growth amounts to over eleven hundred pounds sterling, it is not at all wonderful that the better judgment of some farmers, in regard to form and symmetry, should be carried away by their feelings respecting a "good skin," that is, a heavy fleece.

THE BRANSTON.

These sheep sustain their well-known character for extraordinary size and great weight of wool. As Mr. Marshall says, "It is far more easy to work a flock up to an aimed-at character than it is to preserve whatever marked traits the judgment of a breeder may cultivate." But as Mr. Marshall has, in addition to his own four hundred breeding ewes, the advantages which belong to working with some relatives who possess several hundred more ewes, the issue of the Branston flock is tantamount to the produce of a very large stock. Sheep-breeding is like "change-ringing" on bells—if the number be doubled, the "changes" will be several times increased: thus, in sheep-breeding, under good judgment, every hundred added to the flock adds many years to the time that a flock may be kept together without any danger of degeneration from in-and-in breeding. Some idea of the substance of Mr. Marshall's sheep will be gathered from the following facts: A three-shear ram weighed the enormous weight of 31 stone 12lb.; a four-shear weighed 28 stone; a two-shear 27 stone 4lb.; another of the same age 27 stone; three shearlings, intended for home-use, average 22 stone 9lb., the heavier one pulling down 23 stone 12lb.; two four-shear ewes weighed the great weight respectively of 22 stone 11lb. and 21 stone 8lb., the latter being far from ripely fed. The produce of the wool of these sheep is also something extraordinary for the average per head. It cannot be expected that every fleece of this flock, with its great size, is of the finest quality; but much of it is; and there seems to be but a sixpence or a shilling a tod difference in the somewhat coarse fleeces of 18 and 20lbs. weight and the lighter clips of ordinary quality. Of course, the very fine and lustrous fleeces command a high figure for making imitation alpaca and fine mixed fabrics of wool and silk. But as the demand for flannel shirtings, and blankets is now great, and the serviceable fashion with tourists and sporting as well as business men of wearing cloth suits with rough surfaces continues, there is no present prospect of a fall in this character of wool; therefore quantity, when the form of animals is not neglected, is certainly more profitable at present, from the public demanding it, than is that fineness without lustre, which only comes into competition with the shorter wools, and which are at lower prices from the production of them now being so great in Australia, Hungary, Austria, and other parts of the continent of Europe, where the production of long-wool is either impossible or the yield is limited, from the climate being too rarified and otherwise unsuitable.

This year Mr. Marshall had 150 rams to let and sell, 129 of which are already disposed of. Mr. Marshall cultivates a foreign trade, which he has the better been able to do from having travelled a good deal in continental countries. He has for years been sending sheep to the following places:—Australia, New Zealand, Cape of Good Hope, Natal, Buenos Ayres, River Plate, North America, Canada, Germany, Holland, Denmark, Prussia, and Austria. These facts we mention as points of interest to show how the sons of Old England, when they become colonists, like to try experiments with home-breeds of sheep, the profits of which, in respect to wool they now hear so much of; and there is thus also shown the great foreign trade now done in these sheep, and how it is such foreign nations as Holland, Belgium, and other easily-reached countries were trying to improve their breeds for supplying the English markets with mutton.

THE TEMPLE BRUER SALE.

The Temple Bruer rams sold on Thursday, Sept. 7, although they made the fair average of nearly 10 guineas each, were, comparatively speaking, barely half appreciated. One of the most inconsistent and anomalous expressions now prevalent is often applied to sheep of the Temple Bruer stamp, which are said to be suitable for breeders who fat their own shearlings, but not for breeders who sell at April Fairs! This governing principle, or rather proceeding without any true

principles at all, is altogether an almost incredible inconsistency, or breeders must be presuming greatly on the judgment of the men who go to April fairs to buy. If compact sheep, with wide quarters supported on truly-formed and stiff legs, be the more profitable stamp to aim at producing where breeders fatten off their own "hogs" or "weddors," surely, looking from a rent-paying as well as a public or general point of view, the same characteristics must be equally valuable for those feeders who do not breed but have to buy at spring fairs. If this be so, Lincolnshire sheep-breeding is reduced in some cases to the practice pursued by the razor maker—one sort is brought out for use and another class to sell.

We need not enter into lengthened individual criticism of the sheep brought to the ring by Mr. Robert Howard on Thursday last. It is the general outline and style of movement by the whole that one must judge by, to be correct. It is no secret that the Oxford Down was originally a direct cross between the Leints and Cotswold breeds. Nor is it studiously kept as a secret by Mr. Kirkham that the superiority attained by the Biscathorpe flock is due to the way the raw-boned, primitive Lincoln has been judiciously brought into form and toned down by the more elegant, and, before "coddling" animals was thought to be a scientific proceeding, the more profitable Leicester. Nor, again, is it any secret that Mr. Howard has used some of Mr. Kirkham's best-quality sheep.

We have said the lots averaged nearly 10 guineas. This comparatively low figure cannot be attributed to their want of size, for they were big enough in all reason. Their condition and quality, too, as displayed in the firmness and abundance of their flesh, and in the natural lustre of their wool, were subjects of some comment and approval; and judges seemed to have a growing feeling that there was something very good about them, if they could not screw their minds up to a full assurance that there were signs in the sheep before them that must some day tell on the flocks of the neighbourhood and county. Under this condition of intellect and feeling, a few lively nibbles and respectable biddings were, however, made. Mr. Dean bought 3 sheep, at £16 10s., £24 and £30 respectively; Mr. Bartholomew bought 2, at £18 10s. for one, and £17 for the other; Mr. Gilbert, of Blankney Heath, bought 1 at £18; Mr. R. Wright, of Nocton Green, bought 1 at £14 10s.; Mr. E. Dawson, of Glensworth, 1 at £14; and Mr. Woolhouse, of Wellingore, bought 1 at £30. The remainder were sold at the usual prices given by store breeders for sheep with short legs, who fear that, therefore, they will not begot lambs that at April fairs will "well top the trays," that is, show the back above the hurdles!

PETERBOROUGH NEW FAIR.

Mr. C. Clarke's Ashby-de-la-Land rams, which were sold by Mr. Law, made the highest average of the day. They were a lot of excellent shearlings, 50 in number, and they made £532, or an average of £16 12s. 9d. each. Mr. Parr, a ram-breeder, bought No. 25 at £50; Mr. Godfrey bought No. 23 at £46, Mr. Yoeman No. 27 at £32, Mr. Sampay No. 28 at £34, Mr. Burrows No. 20 at £21 10s., Mr. Cleary No. 1 at £21, and Mr. Daintree, near St. Ives, bought one at £49. This result is undoubtedly fully merited by Mr. Clarke, who has for many years spared neither time nor expense in attempting to bring his flock up to a first-class standard.

Mr. Caswell, of Laughton, obtained the next best average, which was £14 15s. each for 50 shearlings. These were fine sheep, and some of them were of good form and quality. No. 17 was bought by Mr. Caswell of Quadding at £50. Mr. Thorpe bought two at £18 and £20, Mr. Fordham two at £17 and £19, Mr. Checkley two at £17 10s. and £21, Mr. Bird one at £21 10s., Mr. Eve one at £20 10s., and one, No. 24, was bought for Earl Grey at £17 10s.

Mr. Caswell of Pointon ran third, making an average of £14 12s. 6d. each. No. 10 was bought by Mr. Collingwood at £70, No. 11 by Mr. Wallis at £18 10s., No. 13 by Mr. Sisman at £18, No. 20 by Mr. Goodfitt at £28, No. 25 by Mr. Longdale at £18, No. 26 by Mr. Beaton at £22, No. 30 by Mr. T. Tryon at £21, and No. 49 by Mr. Wright of Nocton Heath at £45.

Mr. Thomas Kirkham, of Audleby, near Caistor, had 60 shearlings sold by Mr. Briggs, the average of which we were unable to get, but the following good prices were made: No.

8 was bought by Mr. R. Howard for the Temple Bruer flock, at £46; No. 9 by Mr. Topham, at £28; No. 10 by Mr. Robinson, at £22; No. 31 by Mr. Salter, Attleborough Hall, at £21; No. 51 by Mr. F. Isles, at £23. Mr. Pratt, near Peterborough, also bought three, at £18 10s., £13 10s., and £16 10s. respectively; and one was bought for Earl Grey at £20. Many of these sheep were, as usual, excellent for symmetry and quality.

Mr. Greaves, of Bloxham, had 30 shearlings, which were also sold by Mr. Briggs. Mr. Swain bought No. 1, at £21; Mr. Pringle (a Scotchman) bought No. 9, at £53; Mr. Pogson No. 10, at £26; Mr. Pank No. 11, at £17; and Mr. Frith No. 24, at £21. There were some very useful sheep among this lot.

Mr. Williams, of Carlton-le-Moorland, had 24 shearling and 5 older sheep on the ground, and these were partly offered by Mr. Briggs; but as they came to the ring rather late, and buyers were short, the greater part of them were passed or withdrawn. We were informed that afterwards some of them were disposed of at satisfactory prices. Among them were two enormous 2-shear sheep of fine character, one of which was let to Mr. Topham at £20. There was a deal of fine form and general character about many of these sheep.

Mr. W. Chaplin, of Tathwell, had 16 shearlings offered by Mr. Briggs, but we were unable to obtain the full result.

Mr. Topham, near Rugby, also placed 30 shearlings in Mr. Briggs' hands, who sold them at fair prices. No. 8 we heard sold at £17 10s., and No. 10 at £16 10s. These sheep were very useful for crossing purposes.

Mr. Walesby, near Wragby, brought 21 shearlings; but as the day turned out they came on rather too late, and had not therefore so good a chance as their merits deserved.

Mr. P. Cartwright, of Dunstan Pillar, had 40 very useful shearlings offered by Mr. Mann, and they made fair prices, the leading ones being £14 for No. 24, to Mr. Kingsley; £18 for

No. 16, to Mr. Tarrell; £19 for No. 18, to Mr. Hill; and £37 for No. 15, to Mr. Luster. This flock appears to be rapidly improving under Mr. Cartwright's independent judgment and indomitable energy and perseverance.

Mr. R. Wright, of Nocton Heath, had 36 useful shearlings; but as this was the first appearance at Peterborough, of selections from this flock, and more sheep than buyers being on the ground, the figures realized were not equal to those which Mr. Wright has been in the habit of receiving at the Lincoln fair, which falls next week.

Mr. Burditt, from near Kettering, brought 20 shearlings, but they had too much of the Leicester form and coat to suit Peterborough customers on such a heavy day, and they were taken home again.

Mr. W. Kirkham had 72 offered by Mr. Fox, but they did not make anything more than prices varying from 5 guineas to £9.

Among the other lots were Mr. George Clark's, of Canwick, which numbered 27 shearlings and 5 two-shear; Mr. Wilkes's, of Croxton Kerial, 25 shearlings; Mr. Haek's, of Buckminster, 32 shearlings, which were leggy, and otherwise not admirable; Mr. Waltham's 24 shearlings; Mr. Fisher's, of Weston, 50 shearlings, which sold from 4 to 6 guineas each. And 20 shearlings of Mr. Cartwright's; but these sheep had been far better prepared for the butcher.

In the market-place, the trade for store lambs and stock ewes was somewhat slower, and lots hung on hand late in the day. The new market-place in course of construction in close proximity to the High-street will be a most advantageous change in the right direction for the improvement of the accommodation in this town on market-days; for what with miscellaneous stalls, stock, and machinery, circulation is almost stopped at times. Messrs. Amies and Barford had their usual extensive show of their own manufactures; in addition to which, as machine agents and dealers, they had selections from the stocks of all the best agricultural engineers.

SPARKENHOE FARMERS' CLUB.

MEETING AT LOUGHBOROUGH.

This very prosperous Agricultural Society held its annual show on Wednesday and Thursday, Sept. 6 and 7, at Loughborough, in the park of Mr. Warner, on the Leicester-road. The situation affords a most extensive area, with a good turf and numerous spreading elms and chestnuts, on seats under which the visitors found a pleasant and shady rest. A lofty marquee, capable of accommodating nearly a thousand people, was fixed opposite the hall for the dinner. The society offered nearly £900 in 460 prizes.

The attractiveness of the programme was in no small degree due to the liberality of the people of Loughborough. The visits of the Sparkenhoe Club are sought by many places, and if its committee yielded to the solicitations they receive, it would soon spread the area of its exhibitions over England, instead of being, as at first, limited to a single hundred of the county of Leicester, from which it derives its name. The ground presented a gay appearance during the day; for, whatever may be the views of agriculturists as to the propriety of trimming sheep, the ladies who visited the show did not fail to sport their gayest lines in the bright sunshine.

The shadow of a great threatened calamity, however, hung over the show of stock, and reduced its number greatly, many being deterred from sending their animals from fear of possible contagion, amongst others, the Earl of Howe, the Earl of Aylesford, and Earl Spencer not sending their animals on that account. Last year there were 123 entries of cattle, this year only 74, and of these no less than 24 entries were absent. There were 121 entries of sheep last year, this year only 75; pigs, which were last year 59, fell to 40; horses, from 164 to 127, and poultry from 316 to 201. Though small, however, the show of cattle contained some very fine animals, especially bulls, oxen, and fat cows. A piece of plate or money to the value of £10 offered by Mr. W. Perry Herrick, for the best in the two classes of fat animals, was awarded to Mr. John Lynn, of Church farm, Stoxton, Grantham, which also took first prize of £10 for fat cows. The second prize in the same

class was won by Sir John H. Crewe. Mr. G. F. Mitchell, of Newton Solney, Burton-on-Trent, took the first prize of £10 for fat oxen with a fine shorthorn. A longhorn belonging to Mr. R. H. Chapman, of Upton, Nuneaton, took the second prize. Mr. C. Bosworth, of Dishley, Loughborough, carried off the first prize of £10 for an aged bull, to which was also awarded a £10 cup, given by the inhabitants of Loughborough, for the best store animal. C. W. Packe, Esq., M.P., took the second prize of £5 with another pure shorthorn, bred by himself. Mr. John Ironmonger, of Measham, Atherstone, took the first prize of £10 for a bull under two years old, and Mr. C. Bosworth, of Dishley, the second. The tenant-farmers' classes were not well filled in number, and were only moderate in quality. The shorthorns appear to be gaining ground in this district, judging from the show.

The sheep were the principal feature, though, as a whole, they were scarcely up to the average. The long-wools were a mixture of Leicesters, Lincolns, and Cotwolds, and were a tolerably numerous and good show. Mr. John Lynn took first and second prizes for shearling rams, with good animals of his own breeding, crosses between Leicesters and Lincolns. Mr. Lynn again took a prize with a splendid ram, a cross between a Leicester and a Lincoln. This ram was sold for 200 guineas. Mr. Herrick, of Beaumanor, took first and second prizes for fat wethers; and Mr. C. Bosworth first prize for ewes, and Mr. Herrick for thieves. The long-wooled lambs, for which Mr. Creswell, of Ravenstone, offered two prizes, were a very good class, and were generally commended by the judges. Mr. W. Grewcock, of Barwell Fields, Hineley, took first and Mr. Herrick the second prize. The long-wooled wether lambs were also a good class, in which Mr. Grewcock was again first and Mr. Herrick (who had another animal commended) second; Mr. M. Woodrooffe also received commendation. Mr. C. Bosworth took an extra prize of £1, with two fat ewes of good quality.

The short-wooled sheep were a small show. In the class

for shearing rams the Earl of Aylesford took the second prize, the first not being awarded. Mr. W. Yates, of Grindle House, Shiñfall, took the first prize for short-woolled rams turned two years. It was sold at Colonel Dyott's sale for 31 guineas. Mr. T. W. Yates, of Packington Farm, Lichfield, was the only exhibitor in the class of fat wethers. Mr. T. Oakey, of Normanton-en-le-Heath, near Ashby, took first prize for fat wethers of mixed breed and for theaves; and Mr. J. H. Bradburne, who had no competitor, for a pen of ewes; but there was no competition in the two last classes. Mr. J. H. Bradburne took first prize for a pen of 20 ewes and theaves, receiving also the 45 cup for the best short-woolled sheep. Mr. May, of Ellford Park, took the second prize.

The horses were, on the whole, not quite as good a show as we have seen at the Sparkenhoe exhibitions. The prizes were awarded as follows: Mr. W. Briscoe, of Broomsbriggs, Loughborough, took the first prize of £10 and the £10 champion prize for the best hunter, with a five-year-old; Mr. Thomas Wallin, of High Oakham, taking the second. Mr. G. Wood, Market Overton, took the first prize for hunting geldings or mares; Mr. W. C. Limbar, of Radbourne, Daventry; Mr. E. J. Bird, of Newton Solney; Mr. J. Bonnett, of Coleorton, Ashby; and Mr. C. Palmer, of Calke, for younger horses. The filly class was very good. Mr. Bailey, of Leicester, took the first, and Mr. H. Warner, in whose park the show was held, the second. Lord Berners had a horse highly commended, and Mr. H. Wardle, of Burton, one commended. Mr. Bailey also took the prize for year-olds. Mr. J. G. Led- san, of Birmingham, was first, and Mr. W. P. Herriek second in the brood-mare class; and Mr. J. Bonnett carried off the prize for hackneys up to 10 years old, and Mr. W. Chapman, of Quorndon, for cobs. In the cart-horses Mr. W. Saunder, of Cold Overton, took first prize with an entire horse with very good legs and feet, whilst the cup for the best cart-horse was given to Mr. J. Bennett, of Husbands Bosworth, in addition to the first prize in the filly class.

There was a good show of pigs, Mr. Duckering, of Northorpe, carrying away the chief honours.

The implements were, on the whole, a good show, and the exhibitors wisely confined themselves to showing principal articles.

The Champion Ploughing Match was won by Ransomes and Sims, beating two entries of Messrs. Howard's and some local men.

PRIZE LIST.—CATTLE.

(By the Society.)—For the best fat ox.—1st prize, £10, Mr. G. J. Mitchell, Newton Solney, Burton-on-Trent.

For the best fat cow or heifer.—1st prize, £10, Mr. John Lynn, Church Farm, Stroxtan, Grantham; 2nd, £5, Sir John H. Crewe, Bart.

(By the Society.)—For the best bull, two years old and upwards.—1st prize, £10, Mr. C. Bosworth, Dishley, Loughborough; 2nd, £5, Mr. C. W. Paeke, M.P.

For the best bull, under two years old.—1st prize, £10, Mr. John Ironmonger, Measham, Atherstone; 2nd, £5, Mr. C. Bosworth.

For the best cow in-milk, having had a live calf since December 1st, 1864.—1st prize, £5, Mr. John Lynn; 2nd, £2, Mr. C. W. Paeke, M.P.

(By C. W. Paeke, Esq., M.P.)—For the best pair of in-calf heifers, above two and under three years of age.—1st prize, £5, Mr. C. W. Paeke, M.P.; 2nd, £2 (by the Society), Mr. C. Bosworth.

For the best pair of stirks, above one and under two years of age.—1st prize, £3, and 2nd, £2, C. W. Paeke, Esq., M.P.

For the best pair of steers, under three years old.—1st prize, £5, and 2nd, £2, Mr. C. W. Paeke, M.P.

(By Sir John H. Crewe, Bart.)—For the best long-horn bull.—1st prize, £5, Mr. R. H. Chapman, Upton, Nuneaton.

(By Sir John H. Crewe, Bart.)—For the best pair of long-horn heifers, in-calf, above two and under three years of age.—1st prize, £5, Mr. R. H. Chapman; 2nd, £2 (by the Society), Mr. E. T. Twycross, Canley, Coventry.

TENANT FARMERS' CLASSES.

(By the Society.)—For the best bull, under two years old.—1st prize, £5, Mr. G. Thirby, Rempstone, Loughborough; 2nd, Messrs. W. and H. Gill, Burton-on-the-Wolds, Loughborough.

For the best pair of cows, in-milk, having had live calves

since January 1st, 1865.—1st prize, £5, Mr. R. Cayless, Loughborough; 2nd, £2, Messrs. W. and H. Gill.

(By the Society.)—For the best pair of in-calf heifers, under three years old.—1st prize, £3, Mr. M. Woodroffe, Stanford, Loughborough; 2nd, £1, Mr. J. Johnson, Braunstone, Leicester.

For the best pair of stirks, under two years old.—1st prize, £2, Mr. M. Woodroffe; 2nd, £1, Mr. H. Fellows, Hathern.

EXTRA STOCK.

Bull, 6 months old, Mr. R. Cayless, Loughborough.

SHEEP.—LONGWOOLLED.

(By the Society.)—For the best shearing ram, whether hired or *bona fide* the property of the exhibitor, first prize £5; and second prize, Mr. John Lynn, Church-farm, Stroxtan, Grantham.

For the best ram of any other age, first prize, £5, Mr. John Lynn.

For the best three fat wethers, not exceeding twenty months old, first prize, £3; and second prize, £1, Mr. W. P. Herriek, Beaumanor, Loughborough.

For the best three ewes, having suckled lambs to the 1st of June, 1865, first prize, £3, Mr. C. Bosworth.

For the best three theaves, first prize, £3, Mr. W. P. Herriek.

(By R. W. Cresswell, Esq., Ravenstone, Ashby-de-la-Zouch.)—For the best five long-woolled ewe lambs, first prize, £3, Mr. W. Grewcock; second, £2, Mr. W. P. Herriek.

(By the Society.)—For the best five long-woolled wether lambs, first prize, £2, Mr. W. Grewcock; second, Mr. W. P. Herriek.

(By Mr. C. Stokes.)—For the best fat ewe or wether, of any breed, as extra stock, a premium of £1, Mr. C. Bosworth.

(By the Society.)—For the best pen of twenty long-woolled ewes or theaves (the number of theaves not to exceed one-fourth), the ewes to have suckled lambs up to the 1st of June, 1865, and which are to be put to the ram, and to have been declared as intended to be kept for breeding purposes, first prize, £10, Mr. J. Buckley, Normanton-hill, Loughborough; second, £5, Mr. W. P. Herriek.

SHORTWOOLLED SHEEP.

(By the Society.)—For the best shearing ram, first prize, £5, Mr. J. H. Bradburne, Pipe-pace, Lichfield.

For the best ram of any other age, ditto, first prize, £5, Mr. W. Yates, Grindle-house, Shiñfall; second, £3, Mr. J. H. Bradburne.

For the best three fat wethers, under twenty months old, first prize, £3, Mr. T. W. Yates, Packington-farm, Lichfield.

For the best three fat wethers, of any mixed breed, under twenty months old, first prize, £3, Mr. T. Oakey, Normanton-en-le-Heath, Ashby-de-la-Zouch.

For the best three short-woolled ewes, having suckled lambs to the 1st of June, 1865, first prize £3, Mr. J. H. Bradburne.

For the best three theaves, first prize, £3, Mr. T. Oakey, Normanton-en-le-Heath.

(By the Society.)—For the best short-woolled wether lambs.—First prize, £2, Mr. Joseph Tebbett, Ravenstone, Ashby-de-la-Zouch.

For the best pen of twenty short-woolled breeding ewes or theaves (the number of theaves not to exceed one-fourth), the ewes to have suckled lambs up to the 1st of June, 1865, and which are to be put to the ram, and to be declared as intended to be kept for breeding purposes. First prize, £10, Mr. J. H. Bradburne, and extra prize, £5, ditto.

PIGS.

(By the Society.)—For the best boar of the large breed, first prize, £3, Mr. R. E. Duckering, Newthorpe, Kirton Lindsay; second prize, £1, Mr. R. E. Duckering.

For the best boar of the small breed, first prize, £3, Mr. John Lynn, Church-farm, Stroxtan, Grantham; second, £1, Mr. T. Carroll, Agricultural Colony, Whitwick.

For the best breeding sow of the large breed, first prize, £3, Lord A. St. Maur; second prize, £1, Mr. R. E. Duckering, Northorpe, Kirton Lindsay.

For the best breeding sow of the small breed, first prize, £3, Mr. M. Woodroffe, Stanford, Loughborough; second, £1, Mr. John Garton, Cotes, Loughborough.

For the best three breeding pigs, of the large breed, of one litter, not exceeding seven months old, second prize, £1, Mr. W. Cross, Kegworth.

For the best ditto, small breed.—First prize, £3, Mr. John Lynn, Church Farm, Stroxtan, Grantham; second, £1, Mr. T. Carroll, Agricultural Colony, Whitwick.

HORSES.

(By the Society.)—For the best hunter above four and under ten years of age.—First prize, £10, Mr. W. Brinco, Broombrigs, Loughborough; second, £5, Mr. T. Wallin, Leigh, Oakham.

(By the Earl of Stamford and Warrington.)—For the best gelding or mare of the hunting kind, not thorough-bred, above three and under seven years old, the property of a tenant-farmer, and having been in his possession twelve months.—First prize, £5, Mr. G. Wood, Market Overton, Oakham.

(By the Right Hon. the Earl of Chesterfield.)—For the best colt, not thorough-bred, above three and under four years of age.—First prize, £5, Mr. W. C. Limber, Radbourne, Daventry.

(By the Earl of Stamford and Warrington.)—For the best filly, not thorough-bred, above three and under four years of age.—First prize £5, Mr. E. J. Bird, Newton Solney, Burton-on-Trent.

(By the Most Noble the Marquis of Hastings.)—For the best colt, not thorough-bred, under three years of age.—First prize, £10, Mr. John Bonnett; second (by the Right Hon. Countess Ferrers), £5, Mr. C. Palmer, Calke, Derby.

(By the Society.)—For the best filly, not thorough-bred, under three years of age.—First prize, £5, Mr. E. Bailey, 52, Higher-cross-street, Leicester; second (by E. B. Farnham, Esq.), £2, Mr. H. Warner, The Elms, Loughborough.

(By Mr. E. Bailey, Veterinary Surgeon, Leicester.)—For the best yearling colt or filly, by "Kentucky."—First prize, £5, Mr. E. Bailey.

(By Viscount Curzon, M.P.)—For the best brood mare, in-foal, or with a foal at her foot, best adapted for breeding hunters.—First prize, £5, Mr. J. G. Ledsam, Griffin's Brook, North Field, Birmingham; second (by E. B. Farnham, Esq.), £3, Mr. W. P. Herrick.

(By H. L. Powys Keck, Esq.)—For the best mare or gelding, above four and under ten years of age, most suitable for saddle and harness purposes.—First prize, £5, Mr. J. Bonnett, Coleorton, Ashby-de-la-Zouch.

(By the Society.)—For the best cob, from four to seven years of age, not exceeding 14½ hands.—First prize, £5, Mr. W. Chapman, Quorndon, Loughborough.

(By the Society.)—For the best entire cart-horse, to travel the district for the season 1866; to stand one night in each week during the season at Loughborough.—First prize, £15, Mr. W. Saunder, Cold Overton, Oakham; bred by the late Mr. Lovett.

(By the Society.)—For the best cart filly, above three and under four years of age.—First prize, £5, Mr. John Bowley, Kingston, Derby.

For the best cart colt, under three years of age.—First prize, £5, Mr. James Hawksworth, Barton Blount, Derby.

For the best cart filly, under three years of age.—First prize, £5, Mr. J. E. Bennett, Husband's Bosworth Grange, Rugby.

(By Mr. C. E. Bosworth, Dishley.)—For the best gelding or filly, under two years of age.—First prize, £2, Mr. John Tyler, Loughborough.

For the best cart mare, in-foal, or with a foal at her foot.—First prize, £5, Mr. W. Saunder, Cold Overton, Oakham.

(By the Society.)—For the best cart foal.—First prize, £2, Mr. Garner, Packington, Ashby-de-la-Zouch.

(By Mr. German and Mr. Stevenson.)—For the best cart foal by their horse "Rantan Robin."—First prize, £3, Mr. John Garner; second, £2, Mr. John Grundy, Packington, Ashby-de-la-Zouch.

(By the Society.)—For the pair of cart-horses (gelding or mares) best adapted for the general purposes of agriculture, and which have been regularly worked to the time of the show, to be shown in Gee-Ho tackle.—First prize, £5, Mr. G. J. Mitchell, Newton Solney, Burton-on-Trent.

THE CATTLE DISEASE.

PARIS, Sept. 7.—The following report of the Minister of Agriculture to the Emperor upon the subject of the cattle plague has just appeared:

"Sire,—Since last July England has been suffering from a contagious epizootic disease, which, owing to the proportions it has assumed, is now invested with the character of serious danger. Since I have been aware of this epizootic malady I have requested M. Bouley and Reynal, two professors at the Imperial Veterinary School at Alfort, to repair, the former to Great Britain, the latter to Germany, to collect all the particulars which could enlighten us upon the nature of the malady, and upon the manner in which it might have been introduced into England. At the same time I desired a special commission to study everything relating to this disease, and to propose the measures which ought to be taken in case French cattle were threatened by the malady. I have now to report to your Majesty the result of the labours of the commission, and to submit to the Emperor's approval the arrangements circumstances appear to me to require. The epizootic disease at present raging in Great Britain is that to which the English have given the name of 'cattle plague,' which the Germans call '*rinderpest*,' and the French '*typhus contagieux du gros bétail*.' Originating in the steppes of Eastern Europe, the contagious typhus of horned beasts never develops itself spontaneously outside those regions, whatever may be the bad hygienic conditions to which herds of cattle may be exposed. This etiological question, now completely cleared up by the investigations of professors of veterinary medicine in Germany and Russia, formed the object of a memoir addressed to my department by the late Inspector-General of Veterinary Schools in France, the learned and regretted M. Renault. In that memoir the difficulties of this problem are treated and solved with a correctness of view and an abundance of proof which leave no doubt whatever upon this point. Con-

tagious typhus of horned cattle is therefore a malady exotic to Western Europe. It can never develop itself there under the influence of general and common causes to which it had been wrongly attributed when its history was less known. The present attack in England is due to the importation into that country of beasts of Russian origin, embarked at the port of Revel, in the Gulf of Finland, and disembarked in the docks of the Thames. But if the cattle plague had only one original country, its eminently contagious properties render it, upon the other hand, an essentially migratory disease. Its history bears witness in very numerous instances to its repeated appearance in Germany, Holland, Belgium, France, Italy, Spain, Egypt, and even in England herself, notwithstanding the privilege of her isolation. In all preceding ages it has been almost invariably in consequence of the movements of the armies of the North that the cattle plague has spread beyond what may be called its native country; for the displacement of the large bodies of men which compose armies necessarily implies a corresponding displacement of large bodies of cattle destined for their provision. In addition to times of war, the cattle plague has sometimes been introduced into the western regions of Europe by commercial channels; but in past times this method of introduction has always been exceptional; and when, owing to the researches of German and Russian veterinary *savants*, the fact of the endemic nature of this malady in the steppes of the Russian and Hungarian provinces had been decisively ascertained, the Governments of Prussia and Austria have, up to a recent date, been able to take efficacious measures to protect from it those of their provinces in which typhus is not endemic, and through them all the other regions of Europe. In fact, owing to this very active protection, a period of 50 years has passed without typhus having come to visit us, while in the last century this epizootic disease presented itself in our country nearly every twenty years. But the preservative measures employed by Ger-

many only produced their effects because the migrations of the steppe herds were carried on by land routes. Now that the means of communication between different countries have become so rapid and so easy, the chances of typhus overlapping or evading the barriers Germany has hitherto been able to present to its invasion have greatly increased. Thus, for example, in the present instance, its introduction into England has arisen from the fact of speculators in cattle having found it profitable to draw their supplies from the Russian provinces, and to transport them by steamboats to the English markets, which have offered them sufficiently remunerative prices, Germany having thus been turned, and the voyage from the Gulf of Finland to the docks of the Thames having required less time than is necessary for the period of incubation of typhus, it is in this manner that cattle carrying within them the germs of this ruinous malady have been able to be introduced into England, and that country is again subjected, after 120 years, to the disasters the importation of this plague inflicted upon her in 1745. In this state of affairs all efforts ought to be combined to prevent its invasion of our frontiers, and, if it should unfortunately succeed in passing them, to prevent its spread by confining and extinguishing it in the localities first infected. The danger exists. England and Scotland are invaded, and, according to the latest news, the scourge has been imported into Holland by a vessel laden with cattle intended for Great Britain, and returned with her cargo into a Dutch port, not having been able to disembark it in England; no doubt because the inspectors charged with the surveillance of the ports have perceived the diseased state of the animals the Dutch ship attempted to introduce. Whatever may be the reasons which have prevented the debarcation of the cargo, it appears certain that it is by this means the typhus has been imported into the Netherlands, and might just as well have been brought into France if the Dutch ship, repulsed from the ports of England, had been drawn towards one of our ports upon the shore of the Channel by the attraction of a sufficiently remunerative price. It is therefore urgent either absolutely to forbid entry into the ports of the Channel and German Ocean to all vessels laden with cattle of whatever origin, or to subject the introduction of cattle which shall be brought into those ports to such measures as should be necessary to guard against the invasion of the malady, and it is important that similar arrangements should be applied to our northern and eastern frontiers. However, notwithstanding all these precautions, the epizootic malady may any day be introduced into our departments, and the Government must therefore be upon its guard against this eventuality; but it is not necessary to have recourse to new orders for this purpose. The sanitary police, in its relation to domestic animals, is in fact regulated by a series of decrees of the King's Council, of Royal ordinances and clauses of laws promulgated at different periods, and inspired by the necessities of the time, which constitute a complete body of legislation upon the subject. Among these decrees and ordinances are a certain number which have been exactly dictated with a view to combat the epizootic malady by which we are at present threatened. These are the decrees of the King's Council of April 10, 1714; March 24, 1745; July 12, 1749; December 18, 1774; the decree of the Executive Directory of the 27th Messidor in the year V., and the ordinance of the King, of January 27, 1815. These special acts, which are always in force, have foreseen, laid down, and prescribed all the measures necessary to prevent the spread of the evil in the empire: such, for instance, as the obligatory declaration imposed upon the holders of diseased animals, the inspection of the cattle sheds, the slaughter of diseased animals, and of animals of the same species which have been lodged with them, in consideration of an indemnity granted to their owners; the sequestration of diseased or suspected beasts, the designation by a special mark of those which have been momentarily unable to be removed from the places in which they are lodged, the prohibition of fairs and markets, the surveillance of pastures and watering places—all these being measures which, applied with discernment, permit of the restriction of the epizootic malady to such localities, thus preventing the considerable losses its propagation would entail. The experience of past times testifies to the efficacy of these arrangements. The Administration is therefore sufficiently armed to combat typhus at home; but under the present conditions which obtain in foreign commerce it has not the necessary

power to prevent its importation by way of our frontiers; and it is with the object of investing it with this power that I have the honour of submitting the annexed decree to your Majesty's sanction.

"I am, Sir, &c.,
"ARMAND BELLEC, Minister of Agriculture,
"Commerce, and Public Works."

The decree alluded to above was signed by the Emperor upon the 5th inst. After the usual formalities, it proceeds to order:—

"1. The importation into France of domestic animals, the entrance of which would present dangers of contagious typhus, shall be forbidden, or subordinated to such measures as may be necessary to prevent the invasion of the malady.

"2. Decrees of our Minister of Agriculture, Commerce, and Public Works shall determine the frontiers or portions of frontiers over which the introduction and passage by transit of domestic animals shall be forbidden, and the conditions upon which this introduction and passage shall be authorised."

The Minister of Agriculture has thereupon issued the following orders:—

"1. The introduction into France and the transit of animals of the bovine species, as well as of raw hides and other raw portions of these animals, by way of the ports of the sea-coast, from (and including) Nantes as far Dunkirk, and by the frontiers, upon the north and east from the sea to the Rhine, are absolutely forbidden.

"2. The introduction into France and the transit of animals of the bovine species, as well as of raw hides and other raw portions of these animals, coming from England, Holland, and Belgium, are absolutely prohibited into all the ports and custom-houses of the empire.

"3. In all other ports and custom-houses than those to which clause 1 of these present orders applies, animals of the bovine species imported from any other source than England, Holland, and Belgium, shall be provisionally inspected by special agents. Those which are perceived to be healthy shall be admitted. Those which are found unhealthy shall not be admitted. Those which shall only be suspected, or shall have been lodged with animals found unhealthy, shall be placed under observation for ten days in a sufficiently isolated place, and shall not be admitted until it shall be declared that they do not present any symptom appertaining to contagious typhus."

A PLEA FOR OWLS.

TO THE EDITOR OF THE TIMES.

SIR,—I have just read in *The Times* of yesterday an account of a wisecrack gamekeeper shooting an owl, and discovering, to his great surprise, that she was carrying off a still greater enemy to his craft, viz., a weasel. I will not enter upon the marvellous story of a hawk being killed by the same barrel, for I have known stranger accidents to happen where a cock and a bull were the victims. I have been a game-preserver all my life, but I never would for a moment listen to a plea for the destruction of owls. If "Velvets" would but exert the commonest investigation of their habits, he would find that long before poor "Margery" takes her nocturnal rambles all his young partridges and pheasants are safe under the bodies of their mothers, and (as I never saw a specimen of the *Bubo alpinus* here) hares are very seldom swooped upon by our indefatigable moaser. I think it is the Ettrick Shepherd who says in the *Noctes Anabrosiæ*, "Shoot a howlet? 'd as soon shoot my barn cat."

It is to the indiscriminate warfare which is exercised by blockheads trusted with guns against everything that has life that this cruel persecution of one of the most useful and harmless birds in creation must be traced. And I grieve to say that the measured flap of his snowy and silent wings as he skirts the shrubbery, and the dash with which he pounces upon some field-mouse or travelling mole, are becoming a rarer sight every year. Pray speak one word for poor Jenny.

Yours very truly,
SAINT-HILL.

COMMERCIAL PRINCIPLES APPLIED TO FARMING; OR, AN ANSWER TO THE INQUIRY, HOW MAY THE CAPITAL FOR IMPROVEMENTS BE OBTAINED?

At a meeting of the Wigton Farmer's Club Mr. LAMFORD read the following paper:—

I am not a practical farmer. I make this statement at the outset, not to disarm criticism, but to prevent discussion being diverted by personal considerations from its proper channel. Aware of my deficiencies I shall not involve myself in matters of detail, or venture to give an opinion on controverted points. I shall endeavour to produce authority for my facts, and to show reasons for my conclusions; and I trust, therefore, that my argument may be discussed on its own merits.

I propose in broad terms to define farming, and to describe what I consider to be the essentials of a "practical farmer." Having secured these grounds, I shall compare agricultural operations with those of the manufacturing and other staple branches of our national industry. If I can show that the principles involved in all are essentially identical, I may be allowed to draw the conclusion that all should be guided by the same rules, and be referred to the same standard. If, therefore, it appears that farmers have neglected those principles of business which are essential in other branches of industry, it may be inferred that their absence renders the operations of the farm uncertain—often wasteful, and not seldom unprofitable. And the converse will follow: their intelligent adoption will tend to effect the union of skill with capital—will equalise and increase the profits of the farmer—will stimulate the progress of agriculture, and raise it to the rank of a scientific pursuit—to the benefit of all immediately interested, and to the promotion of the well-being of the nation.

1st. I ask, what is farming? Is it a manufacture—a trade, or is it an occupation or business peculiar to itself?

I adopt the statements of our President (Sir Robt. Briscoe, Bart.)—"Land is a machine through which the farmer passes his capital; you are but as tradesmen or manufacturers; you sell and you buy; you manufacture your goods equally with them, though you select land as your manufactory, because best suited to your rearing and knowledge." This is sound sense, and to the point. The manufacturer works by the application of known mechanical laws. The farmer watches and profits by the ascertained effects of a round of seasons, of variations of temperature, of alternations of soaking rain and of drying winds, and of the ever-acting, insensible influences of chemical affinities. Similar natural laws work in their ceaseless round for the manufacturing chemist—for the calico printer, and for the bleacher and dyer. There are in all these cases distinctions, but no differences. If it be said that the seasonal changes by which the farmer effects his transmutations of increase are fickle, and only to be dealt with by a system of long averages, while the laws of chemistry and machinery are consecutive and calculable—let me instance, in reply, the merchant and shipowner, who carry on their operations under natural changes as sharp in their uncertainty, involving greater risks, and yielding more precarious results than any farming. Talk of the potato rot, and I can point to the cotton famine. Against a cattle epidemic, I can set a strike for wages. A wet autumn is as disastrous for the manufacturer of fancy goods as for the farmer; and the law of supply and demand shows as many distressing ripples on the great waves of transition as local atmospheric variations, which here and there punish a few farmers, while the average of the world is undisturbed.

The farmer, therefore, I maintain, can claim no exemption from the operations of those principles which are applied to other branches of industry. He has no peculiar function. He can set up no wall of separation. He can raise no plea for immunity, but must be weighed in the same balance as all other trades. In one word, farming is essentially a *manufacture*, and one carried on under more than the average of healthful and pleasurable influences.

2nd. Let me ask the question, what constitutes a "practical farmer"?

According to the etymology of the phrase, a practical farmer is a person who practises farming. But such a definition will hardly pass current in this room. A distinction must be made between those who practise farming for pleasure and those who carry it on for profit. And yet what shall we say of Mr. Mechi, for example? He is no mere theorist. What he preaches he practises. A regular system, as far as I can understand it, has for years been carried on at Tiptree. There is as steady a conversion of manure and oilcake into corn and meat on his farm, and with as close an economy, as on any of the best Cumberland farmsteads. No doubt Mr. Mechi is independent of the results of his farming operations, and this independence perhaps marks the best line of distinction. Let us, therefore, consider a "practical farmer" to be a person who farms for his living, and we shall perhaps meet the difficulty. This definition will cut off *dilettanti*, merely amateur dabblers in agriculture. It will enable me to speak of farmers as a class who make farming their trade, and follow it for profit. It will bind them to conduct their business upon true commercial principles, and lay them open to free criticism, while it challenges comparison in management with other branches of our great national industry.

I assume, therefore, that farming is a manufacturing process, and that a practical farmer is a person who engages in this process to gain a livelihood—that he makes it his avowed occupation, and gives up to it his whole time and attention.

I assume, also, that there is no reason why his operations should not be guided by the broad recognised principles of production which make other branches of trade yield a fair amount of profit.

What, then, are those recognised principles? 1st, I instance the important one of *division of labour*; 2nd, the employment of approved mechanical and other appliances for economizing labour and lessening the cost of production; and 3rd, a maximum production from a given fixed outlay.

These several requirements demand an extensive business, ample capital, and a regular system of management. The advantages of *division of labour* are so well known, when applied to the details of all manufactures, that I need not dwell upon them now. My object is to show that they are equally efficacious as respects the general direction of any business.

The question is, can those masters succeed better by carrying on three separate concerns, or by combining to carry on one large one?

It seems to me that the day for small businesses has gone by. Weaving has been gathered into huge mills; and the small manufactories that nestled in the cleughs of Lancashire and Yorkshire, and utilised their scattered water-power, have been absorbed into nuclei, of which Saltaire is a princely example.

I think that the prevalence of partnerships in most businesses proves that extensive operations with division of labour and combined capital are more profitable than the single-handed prosecution of several small ones. It may even be a question as to whether ordinary partnerships and businesses of average extension may now be undergoing supervision by the spread and wider action of Joint Stock Companies.

Several partners attending to different branches of the same business appears to have been much tested and approved in most occupations. The man who has a good head for finance may be little fitted for the mechanical processes of production, while a man whose special aptitude is for the details of the manufactory may be utterly unfit for the operations of the market and exchange. Again, the buying and selling in a large business is as clearly distinct from the finance and book-keeping as from the processes of production. A combination of especial aptitudes, with a union of the capital at each partner's command, appears to effect that organisation which underlies all large and successful businesses.

It is only in large concerns that it is possible to employ steam power and its accompanying host of mechanical con-

trivances by which labour is diminished and time saved. And lastly, it is only by ample capital employed in extensive operations that the maximum production from a given fixed outlay can be attained, and a reduction of all fixed expenses to their minimum effected.

Now, what is the position of agriculture in the face of this great economical bias in all other trades?

Have we, as a rule, large farms—farming partnerships with combined skill, energy, and capital?

Have we the recognised necessity for the employment of approved mechanical appliances, and of a high pressure production? I am afraid not—and why not?

How is it that, in a business like farming, taking in so varied a range of processes—of *tillage*, with its knowledge of soils, manures, and rotations; of *stock feeding*, requiring judgment as to cattle, and intelligent experience as to breeding and feeding; of its general arrangements, demanding skilful direction of labour, and the superintendence of many mechanical processes—how is it that, as a rule, farms are small, and are managed single-handed? If I might do so without offence, I would ask, Are the farmers as a body more intelligent than other commercial men? are they better educated? more specially trained? or more naturally apt to master the details, and carry on the processes of a complicated business?

For an answer to these questions, let us glance at some of the statistics of agriculture.

In 1851 there were 285,936 farm holdings in Great Britain. Of these no less than 170,814, or considerably more than *one-half*, were under 50 acres! The average of the whole number of farms was only 102 acres, while 91,698 farmers, or nearly *one-third* of the entire number, employed no labourers.

The amount of capital employed must always be a doubtful question. M. Laverigne, an intelligent French agriculturist, who visited this country in 1854, estimates the farmers' capital in England at £3 7s. per acre. The farmers' profit he estimates at half the rent, or 10 per cent. on the capital invested. Mr. Meehi, in an elaborate paper read before the "London Central Farmers' Club," estimates the farmers' capital at £4 per acre, or a total of £200,000,000, and the acreable produce at £3 12s. The conclusion he draws is "the painful conviction that there must be an immense tract of country unprofitably farmed and insufficiently capitalised."

Now, gentlemen, looking at these statements, may I not safely assume that the commercial principles I have dwelt upon, as being essential to the progress and success of all other trades, are, as a rule, wanting in agriculture? How can an average area of 102 acres give room for an economical division of labour, or employment for expensive but profitable machinery? And how can a capital of £4 per acre so stimulate production as to minimize all the heavy fixed charges upon land in cultivation? While all other branches of industry have been obeying the ascertained necessity for concentration and for high pressure production, I appeal to the inexorable logic of the facts I have adduced, to show that agriculture has resisted the warning and the invitation of the times. At first sight it seems strange that so large a portion of our national industry should be content to be an exception to the general rule of progress and profit; but there seems to me to be an explanation for the anomaly, and it is this: The large farmer finds in his business a social consideration and leisure for amusement which no other occupation of equal extent can yield. On the other hand, the small farmer can find no employment in which his manual labour, with that of his family, along with the small capital he commands, can be so independently engaged. The latter gets his living, and is his own master, and is content. The former gets his living, can meet his landlord in the hunting field; can fish, and shoot, and drive his dog-cart, and finds his solace for a small profit in the consideration and social standing, and in the freedom from anxiety which three times the return and double the capital in other business would not yield.

Take the case, for example, of a farmer holding, say 500 or 600 acres, and say further that his capital is some £4,000 or £5,000, and contrast his position and standing with that of a small manufacturer or tradesman employing a similar capital. The latter, by close attention, will no doubt make twice or thrice the profit that the farmer will; but dare he follow the hounds? or take out his certificate? or take leisure for any sport he is inclined to pursue? What would his neighbours say? Where would his credit be? How soon would he be

sent for into the bank parlour, or find his name in the *Gazette*? No law is so clearly understood as this—that *capital* follows *confidence*. Confidence and credit are identical, and, until farming is made a purely commercial undertaking, and carried on upon recognized commercial principles, I, for one am not surprised that agriculture should be held to be bare of capital, and that the question should be so frequently asked, Where is the capital for improvement to come from?

Nothing convinces me so clearly of the want of the commercial spirit in farming as the almost entire absence of book-keeping. In every other business worthy of the name, anyone carrying it on without a proper system of books would be regarded as crazy. If he were unfortunate in business, he would on this account be liable to be severely punished in the Bankruptcy Court by his certificate being withheld. By book-keeping I do not mean simple entries of what a man sells, or even a debtor or creditor account kept of his cash. Properly considered, a good system of books is a *registry of results*. By it every variety of crop and every variation of quantity is brought out, ready for comparison on an unvarying common denominator—money. Prize cattle, show-turnips, giant wheat, all the results of fancy cultivation, are reduced to the inexorable standard of this common denominator.

The tissue of loose talk and mere guess-work, by which many a farmer gropes his anxious or whistles his easy way, is resolved by a few columns into hard facts, and measured by a standard unerring and precise. By a proper system of book-keeping alone can any farmer or other producer get a satisfactory answer to the main question of his business, *Will it pay?*

Any practical farmer will tell you *about* what it will cost to plough, to reap, to mow. But general estimates are general delusions. Every man's locality, his manufactory, machinery, and all other concomitant circumstances, differ more or less from another man's; and every man's farm, and every field in it, must also make a difference in the cost of a variety of operations; so that no estimate, except his own experience, ought to be a law to anyone. Now, nothing can make that experience trustworthy and valuable except there be a registry of results; for there can be no reduction of results to a common denominator, except by proper book-keeping. "Many a person will say that if he 'knows his business' (that is, in detail), buys and sells shrewdly—looks, in short, after the pence, 'that the pounds will take care of themselves.' Many a man is satisfied with working away on the faith of stereotyped estimates, or on no estimate at all, depending upon his memory and judgment, which may be defective, if not treacherous, and thinks that if he cultivates his land after the manner of the country round, that he cannot do better. To these persons I will put a single case: Two men have similar farms; but one has a clever managing wife, a steady, hard-working son, and a bright, active daughter: the habit of the other's household is thrift, pleasure-seeking, and extravagance in dress. The outlay of both households is mixed up with the farm expenditure—all incoming and payment being made out of the traditional old stocking. The one man gradually increases his store: the other is in a state of chronic complaint that 'farming does not pay.' Now, both may be wrong. The satisfied farmer may be making less by his farm than the other, but both are equally in the dark, because neither keeps books."

The first objection to book-keeping will be, no doubt, want of time. Now, whatever else a farmer does, it seems to me that this ought not to be neglected. A man carrying on business without books is like a ship at sea with no compass. But, may I be permitted to suggest that when out-of-door work is impossible, the winter evenings are long and tedious, and that a simple set of books need not take more than an hour a week to enter up? Then, again, allow me to ask whether it is absolutely necessary that a farmer should attend a weekly market. One-sixth of a farmer's time seems to be a large proportion to spend on the road, and in the market-place, to sell a small amount of produce; and I will only point at the temptations otherwise put in his way by this mode of transacting business. To the 91,000 farmers employing no labourers, this market-day cessation of farm-labour amounts to a sacrifice of something like one-sixth of the whole work performed on the farm. Talk of farming not paying! Why, no other business or trade in the country could possibly exist at all under a tax so heavy as this! The infusion of a more thoroughly commercial spirit into agriculture will no doubt effect a change in

this point. It will also, I trust, in time establish a more economical mode of converting the bulk of the farm produce into money. The small farmer confessedly wants capital; but has he ever calculated the loss of interest he incurs by maintaining a well-filled stack-yard? Has he ever made out the per centage of loss to the agricultural interest from the depredations of vermin, or the effect of mildew? I do not venture here to enter into details, but I may state that the admission that steam-threshing is an advantage, will itself dispose of a host of small objections against it. Commercially considered, it appears incomprehensible that while the land is hungering, and the farmer is calling out for capital, a considerable amount of capital is kept worse than idle in the barn and stackyard. Of course, a rapid and general conversion of produce into money would require an increase of middlemen or co-factors, with their capital, to prevent any great decline of prices. Should such a change become general, as in time I apprehend it must come, its influence on prices will be nullified, as is the case in other articles. Cotton, sugar, tea, flax, and colonial timber are all put into the merchant's hands as quickly as possible, and the course of trade adapts itself to the pressure. Capital in second hands is ready to receive them, and the supply for consumption is regulated by experience and sustained by capital. The first excess is thus impounded as it were, and the stream for consumption is regulated to meet the wants of the year, without unnatural depression in prices. Under the present system it is notorious that the supply of most provincial corn markets is affected by the farmer's conveniences or necessities. If he wants money, or has leisure, he thrashes and sells; and if it so happen that several are equally influenced at the same time, prices are forced down without any adequate or general reason. Now, why should farmers double their produce upon the market by a system so serious and costly in expenditure of time, and by so disastrous a locking-up of capital, so much wanted on the land? Many no doubt get advances upon their stacks; but this, as it causes them to pay for the accommodation, ought to realize the loss they incur in holding them month after month. A farmer ought not to be a corn dealer, any more than he ought to be a miller or a baker, unless he possesses ample capital for all (as separate trades), and has some special aptitude or advantage in carrying them on together, which is seldom the case. The farmer's business is to produce corn and meat, and he is the best man of business who concentrates his efforts, and applies all his capital to till his ground and feed his stock.

Before I proceed, let me summarize what has already been advanced.

Farming is a business, similar in its broad features to all other trades or manufactures, and should be managed on the same general principles.

The present condition of agriculture shows, however, that the true commercial spirit is wanting in this branch of our national industry.

This is proved by the average small size of the farms in Great Britain—by the consequent primitive character of the appliances for culture—by a wasteful and expensive general management—by insufficient capital, and a minimum production—by an almost entire absence of systematic book-keeping. The natural consequence of this state of things is a want of confidence amongst capitalists in farming, as a profitable investment.

That "farming does not pay" is a generally received opinion; and from the absence of systematic book-keeping, good farmers cannot prove themselves an exception to the rule. Hence it is that capital is so deficient—that High Farming is the exception—and that agriculture is stationary in the face of a universal progression.

It now follows to determine how the capital for improvements may be obtained? Our president says: "By reducing the size of your farms." This is a clear and intelligible indication how a man may increase the proportion of his capital *per acre*, and, I think, a plain and practical suggestion how a man may make the amount of capital he *now possesses more profitable*. But I submit with all deference that no hulk is thereby afforded as to how a man may increase the amount of his capital available for cultivation, nor does it show from what quarter, or by what process, agriculture is to attract the capital necessary to raise it from a state of imperfect action to one of profitable activity.

If Mr. Meech is to be credited, agriculture, which now vege-

tates upon £4 an acre, requires a sum of £300,000,000 to make it pay. If our President's expedient were to be generally adopted, this branch of industry will require some 80,000 new tenants, possessing or commanding the use of this vast sum. To realize the difficulty of obtaining this large number of new tenants, I may state that even if farming could be put into successful competition with other trades as to profit, it would take every druggist, draper, and bookseller in the country to make up this number, while twenty years of the ordinary increase of population (making due allowance for emigration and drafts to other trades) would not enable the farming class of itself to attain to the requisite dimensions.

These considerations must convince us that it can be by no empirical process—by no sudden or violent change—that the whole cause and condition of agriculture can be transposed from apathy to activity, from money starvation to abundance, and from a state of "not paying" to a fair place amongst the profitable staple trades of the country. It will require many and many an answer to the feverish question, Where is the capital to come from? to unravel the maze web of diverse interests, habits, and requirements. It must be by many and many a process of action and re-action, and by a host of expedients—our President's ingenious and practical, but necessarily narrow one, among the rest—that agriculture will be revolutionized and ultimately built up, as it should be, into the most enduring industrial edifice of our social state.

If what I shall advance, therefore, differs from what our President advised last December, do not suppose that because of that difference there is opposition.

The house cannot be built without the scaffold, and palliatives must precede cures; but the gist of the argument and the full measure of the difference may be brought out by the question—Did Sir Robert Briscoe say one word against large farms when filled with ample capital?

I therefore proceed with an easy conscience to advocate *large farms*, as providing, under proper arrangements, what small farms cannot do—namely, the foundation for *division of labour, mechanical appliances, consolidation and increase of capital*, and for a profitable high pressure rate of production.

To bring about slowly, but effectually, this combination of advantages, there seems to me to be one simple recipe—**FARM PARTNERSHIP**: and as most necessary to effect this result—*systematic farm accounts*.

My plan is this: Let two farmers join together, the one to look after the tillage, the other to take charge of the stock, and associate with them a third, with sufficient capital to farm some 600 to 1,000 acres, on the best system. The third may be a sleeping partner: or, say the younger son of a country gentleman, to whom might be assigned the charge of the books, the superintendance of the machinery, or such other special branch of farm business as he may be capable of managing. From the overcrowded state of the professions, such an opening for the younger sons of country gentlemen who might be averse to trade, would, I apprehend, be eagerly sought. I can hardly conceive a better position for a young man of good connection than a partnership with one or two clever agriculturists; and I can conceive no more advantageous mode than this by which a couple of clever farmers may find scope for their energy, and utilize their experience and ability to the best advantage. Or, as I have said, the minded partner might be what is termed a sleeping partner, the division of profits being in proportion to the work done, or money supplied. To such a firm of course book-keeping would be essential; and, to a firm so constituted, I conceive no bank would refuse such temporary accommodation for legitimate trade purposes, as it might from time to time require.

Although the amount of capital which agriculture is capable of profitably absorbing is something prodigious, amounting—with draining requirements and permanent improvements, in addition to farmers' wants—to something like £300,000,000; yet the capability of the country to produce or supply it is not less prodigious. The amount of surplus profits or interests accruing is generally estimated at annually £80,000,000, while the power of commerce to create its representatives is enormous. I estimate the profits of trade at £200,000,000 annually, representing a capital employed, or turned over, of some £2,000,000,000. Now, if everyone paid his accounts in three-month bills, instead of cash, or, at all events, if three months' extra credit was generally taken over the ordinary period of payment, a sum of £500,000,000 would be at once

available for the purpose of commerce. And this is regularly done to a greater or less extent when money is in demand.

Such a result, however, can only follow, or be supported on confidence. Capital is as mobile, and follows as simple a law, as water in finding its level.

The safest and most profitable business always requires, and will command, the largest share; and I may safely say that no business with these characteristics was ever crippled in its development and operations by the want of capital. It is only businesses that do not pay, and that are carried on in a way that does not command the confidence of the monied class, that are starved and cry out. Once show, therefore, that agriculture is fairly profitable, and establish a fair claim to confidence from its organisation and management, and from a thousand minute and unsuspected sources, and in a thousand ways inscrutable or scarcely traceable, capital will find its way—like water into your deep drains—to fill the empty coffers of the farmers, and fructify their half-cultivated fields.

Mr. BANKS observed that he had long been of opinion that farmers were trading beyond their capital, which in any business was attended by the most unfavourable results. In such cases, they were obliged to forego many advantages which their neighbour had over them who could come with ready money: they were forced to purchase on unfavourable terms, and to forego profits, thereby losing at both ends. They could not go into the best markets and select the best goods as the opportunity arose, as they had bills which *must* be matured; and so it went on, a losing game, till at length they broke down, bringing others to ruin in the collapse. The remark he applied generally to all trades and businesses as at present carried on, and farmers were not exempt. They had not the capital to do justice to the opportunities of their position. They could not purchase good animals to improve their stock, nor expensive implements to economize their labour; and it was equally clear that the same cause prevented their applying such nourishment to the land as, under God's blessing, could lead them to expect good crops. The result was failure, and consequent distress and disappointment, with an aggravation of the very evil in which it originated. He had no hesitation in saying that many farmers could produce as much with half the land and proper means and appliances as they did now; and he counselled them, therefore, to increase their profits and circumscribe their area. He agreed with Mr. Lampport that, through the agency of farmers' clubs, partnerships might be formed for farming with advantage, as in commercial speculations; and he also agreed that in all farming operations there should be a strict system of book-keeping, so as to show the profit and loss. He had lately the pleasure of staying with his friend the late high sheriff of Lancashire, where that system was carried out to the minutest article with eminent success; and he thought Mr. Lampport's paper was pregnant with remark which might be followed up with advantage by the club.

The CHAIRMAN reminded the members that Mr. Lampport had started with the admission that he was not a practical farmer, but he was a practical and successful merchant.

Mr. LAMPFORT: I came here, gentlemen, with the full intention of being entirely cut up.

The CHAIRMAN continued: He was glad to find they had a member of that club even bolder than himself. He had himself spoken with less reserve, not that he did not in heart go the whole length of Mr. Lampport's conclusions, but because he felt that in that district they were scarcely prepared for such a stride. The question now to consider was, how circumstances were to be dealt with so as to lead to the desired improvement. That farming was to be allowed to be subordinate to manufacture was not for a moment to be suffered; for, after all, farmers were nothing but traders, and the man must succeed the most who was the best judge of feeding and breeding a good animal, and of the mode of producing from the soil the best food from which it was to be fed. How often had they heard the remark that such a man was a capital judge of a beast, but he could not manage his land; and, again, that though he could manage his land, he knew no more about a beast than a man's boot! One man thrived on horses; another at his head off on cattle; and *vice-versa*. He confessed that in his paper his intellect had said one thing whilst his feelings had dictated another. He could not bring himself to admit the truth that the time was fast coming when there was no longer the same chance for the hard-

working labourer, who had handled the plough in his youth, occupying as a comfortable farmer in his old age the land he had tilled as a servant when a young man. He had many such amongst the best of the farmers upon his estate at the present moment; and he had felt it too painful an effort to close the door for ever upon all of that worthy class. He had been inclined, therefore, to treat the subject as a palliative; but he was convinced, nevertheless, that large profits, which the extensive farming operations of the present day demanded, were only to be secured by large and powerful combination, with ample capital to work upon. That was the only chance of making an adequate return. The moment two men with capital were united to make a profit, book-keeping must follow; for, without proper book-keeping, there could be no partnership, and no practical working whatever.

Mr. MESSENGER, whom the chairman asked to say something, said he could not, but immediately added that it was admitted that they were all advancing from being low farmers to what was called high farming, and to succeed in high farming they must resort to steam-ploughing, and take advantage of all the newest machinery. In that case they ought to have £7 an acre.

Mr. LAMPFORT said he put it at £10 per acre, and had provided for that by suggesting combination, by which alone it could be secured.

Mr. MESSENGER did not think the Hon. Baronet contemplated steam-ploughing when he limited it to £6.

The CHAIRMAN: No; I took the general class of farming prevalent. But it has been shown that by two or three of the principal farmers joining who understood their business these requirements would follow, and if reduced to a commercial basis, the capital would follow as a matter of course. There might be the practical stock breeder, the practical cultivator of the land, and a sleeping partner with £5,000 who would perhaps be able to look after the machinery and book-keeping. That is the most rational view of the question. That we shall all cultivate by steam, sooner or later, I have not the least doubt, and those who won't do so will have to walk about their business. The only question now is—how long we are to bear the lash before we confess that we will be good boys for the future.

Mr. MESSENGER: Aye, but where's the money to come from?

Mr. LAMPFORT used for a moment apply to Mr. Messenger the *argumentum ad hominem*. He believed that gentleman was the owner of his own land (he was not aware to what extent), but say to 150 acres. Taking that at a fair valuation it was worth £9,000. He had no doubt Mr. Messenger farmed moderately high, and had a capital of £1,000 to work upon, and that gave in round numbers £10,000. Well, then, his advice would be, if he wished for a larger income, sell the land, take a large farm, and he would make a fortune in ten years. To adopt another plan; let him still sell his land, and buy railway debentures, and then he could make £400 a-year, and more than 10 per cent. upon his floating capital, without any trouble or anxiety, whilst he was sitting at home doing nothing. If ambitious, he must adopt the other course. Farmers who held land were indulging in a luxury others were deprived of, and which the exigencies of the times did not permit. They were holding land that they had no business with. If they did so, they must inevitably do so at a loss, under the circumstances; and if they choose to do so, they had no right to come there and complain that it did not pay as a commercial speculation. They had locked up so many acres from the enterprise of others, and if they wished to be farmers they must not be landowners at the same time—at least without ample capital to cultivate it.

Mr. MESSENGER: Then you would have me adopt Mr. Meehi's plan of dividing my farm till I had what I could manage?

Mr. LAMPFORT said that he quite agreed with both Mr. Meehi and Sir Robert Brisco upon that point, that if they could not get more money upon the acreage it would be better to reduce the acreage and get greater profits by the adoption of a higher system.

The CHAIRMAN observed in reference to steam-cultivation, that if one farmer could not afford to purchase a steam-plough several could combine to do so for joint use, and here the principle of partnership recommended by Mr. Lampport's paper made its appearance at once. All things tended that way till

at length by the union of intelligence and capital the desired change would eventually and gradually be accomplished. They must meet each difficulty as it arose, and anticipate none unnecessarily. He had always found it a golden rule that sufficient for the day was the evil thereof. If they met it as it arose, and let it quietly slide by, that was sufficient. They might depend upon it that no land would ever be permitted to go out of cultivation. At the time of the project of the Manchester and Liverpool Railway, great was the outcry amongst the farmers of the whole district that their occupation would be gone when that fact was realised. But what was the actual result? Instead of horses not being required, there was a greater demand for horses at the two termini alone to take the increasing traffic to that line than the whole of the district was capable of producing.

Mr. LAMPORF asked if any member would state the objection to bringing the contents of the barn in bulk to the market, instead of keeping it idle in the stackyard.

Mr. MESSENGER said that the millers, so far from purchasing their corn in bulk, told them already that they could do without the farmer altogether, so great was the import of foreign corn. Therefore if the farmer took his produce in bulk to the market he would only have to take it home again.

The CHAIRMAN thought if the farmers would show a disposition to bring it in bulk to the market, means would soon be supplied for disposing of it; but of course that would involve the agency of middlemen which Mr. Lamporf had spoken of. The difficulty in that district was as to the straw. The moment

they began to let air into the stacks the straw deteriorated, and the farmers were anxious to provide their stock with the best new straw that could be had. Then the grain required time to acquire what was called the "handle," and if it lost that it was depreciated in value, and there was a variety of obstacles in the way of disposing of the crops in bulk.

Mr. LAWSON, M.P., said the valuable paper they had heard that day might be regarded in the light of a supplement to the paper previously issued by Sir Robert; they agreed pretty well on the whole, and the principle advocated in both had received the sanction of that Club, whatever difference of opinion might have arisen amongst the letter-writers. He thought some of the suggestions of Mr. Lamporf as to partnership very valuable; and in his own case, the fact had happened that a younger brother had become a partner in the concern, and was a very good farmer. It was not to be supposed that he (Mr. Lawson) was content to be only a "sleeping" partner, for he had looked very narrowly into the working. In farming, they should not forget the advantage and pleasure of living in the country, and enjoying all the beauties of nature, which the commercial man, cooped up in the smoky town, was deprived of. There was, withal, the romance of the thing; and what mattered two or three per cent. more in the return, if all their pleasure was sacrificed in the making of it? His advice was, therefore, if farmers were happy in their occupation, and could make a living by it, let them stick to farming; at the same time, he had not the least objection to any improved method by which it might be made to pay better.

EXPERIMENTS IN CATTLE FEEDING.

Last spring, Mr. A. Smith, Stevenson Mains, East Lothian, who has given much attention to the fattening and rearing of stock, having a pretty large quantity of potatoes on hand about the time when he was beginning to feed off his cattle, thought of trying how they would thrive on potato diet, with the usual quantity of oilcake. The cattle were accordingly fed off with the potatoes, and thrived so well on them that he resolved on testing the qualities of the root still further this season, by feeding from first to last entirely on potatoes. He at the same time, for his own guidance in carrying out the pulping system, to which he is a convert, made a separate experiment to test its value as against feeding in the ordinary way with sliced turnips. A lot of cross-bred Short-horn stirks, rising two years, were bought by him at the Linton October market last autumn, and divided as equally as possible with regard to condition, size, and so forth, among three courts. The lot numbered twenty-six of which were to be fed on potatoes, seven on pulped turnips, and seven on sliced turnips, with the usual allowance of straw in each case—the pulped-fed cattle getting theirs chopped. From the moment they entered the courts, up to the month of March, when the whole of them for the first time, and in the same proportion, got oilcake and barley-meal to finish off, the cattle were kept exclusively to their own kind of diet.

A very short time served to show which was the most nutritive article of food. Almost from the first the potato-fed cattle took the start of their neighbours, and, to use a racing phrase, were never headed, but came in at the finish a good way in advance of the others. They took to the potatoes with the greatest relish, and never gave the slightest indication of "hoveu" all the time they were being fed on them. In fact, no beasts could have given less trouble or anxiety from the day they were put into the close till they were taken out in the early part of May—a period of about seven months. While the experiment was thus satisfactory with regard to what we may call No. 1 court, it was not the less so as respects No. 2—the court containing the cattle fed on pulped turnips. These also, almost from the beginning, evinced a superiority over their neighbours fed on the sliced turnips. They were decidedly in better condition, and brought more money—perhaps the best test of all that they had been better fed. The cattle, as we have said, when they went into the courts, was placed as nearly as possible on an equality, and their difference of condition at the end of the experiment was solely due to

the difference of feeding. The average price obtained for the lot was £17 5s. each. They were sold privately, the value put on them by the purchaser—a dealer of judgment—being as follows: No. 1 court, £17 15s. each; No. 2 court, £17 5s.; and No. 3 court, £16 15s. In other words, the potato-fed cattle brought 10s. per head more than those fed in the ordinary way.

The value of the experiment consists, of course, in the expense of raising the different lots, because if No. 3 court were fed off cheaper than No. 1 court, no inducement is offered to make any change from turnips to potatoes. This point can be satisfactorily answered. Each of the courts was supplied with a daily allowance of turnips carefully weighed or measured, and it was found that while in the case of the No. 3 court the seven cattle consumed 11 cwt. of turnips per diem, those in No. 2 court were well and better fed with 9 cwt., or 2 cwt. per day less. This was a direct saving in the cost of the turnips; but it also saved a matter of some consequence, the expense of carting the extra quantity from the fields, which could be much more easily and profitably eaten off by sheep as they lay in their drills. As a set-off against this, there is, no doubt, to be placed the cost of the pulping; but this is not a very serious matter. Mr. Smith does not employ steam for the purpose at Stevenson Mains, but has a one-horse power machine, which he finds answers extremely well. The amount of work which it gets through is large, amounting to about 3 tons per hour, amply sufficient for the wants of a pretty large number of cattle we should fancy. There is also the wages of the girl who attends the pulping machine when it is in motion; but making every allowance for these items of expenditure, Mr. Smith is quite convinced, from his experience of the system, that it is, when properly conducted, in every way more profitable to pulp than to give cattle the turnips simply sliced. His experiments this year seems to prove that not only can they be fed on a less quantity of turnips, but that they bring a better price when fat than the others.

Taking the value of a ton of turnips at 10s., the average weekly cost of feeding the No. 2 cattle amounted, as nearly as possible, to 4s. 6d. per head, while the No. 3 cost about 1s. per head more. The calculation can easily be made, and will be found as stated. But the potato-fed cattle show a considerably greater saving. The courts were put under the charge of a careful and experienced cattleman, whose instructions were to note down exactly the amounts consumed in

each close. From the book which he kept, we find that the six cattle in No. 1 close only consumed a weekly average of about 15 cwt. of potatoes, which at 25s. per ton gives 3s. 1½d. as the expense per week of feeding each beast, and feeding it £1 per head better than with food that costs 2s. 4½d. more money weekly. It is also to be remarked that the potatoes used were unmarketable, in so far that the firsts and seconds

had been selected from them, and were only available for the starch mill or for feeding purposes. So satisfied is Mr. Smith with the result of his carefully-conducted experiment in potato-feeding, that he intends continuing it next year on a larger scale. He has no doubt as to its being the most profitable, as it is undoubtedly one of the easiest modes of fattening lean cattle for the market.

SALT AS A CONDIMENT FOR CATTLE.

Although the use of salt, both as a condiment for cattle and as manure, has long been known to the agriculturist, we are disposed to think that its employment has been greatly neglected by the majority of them, for reasons which reflect no credit upon their reasoning powers, or rather upon their knowledge of the principles of true economy. As manure, it is the cheapest auxiliary to the dung-heap that can be used, because the proportion to be employed—which, by-the-by, is well-known—is small, and must not be increased. Like many other minerals, if used properly and carefully, it is highly beneficial: if used in excess of the proper proportion it is a deadly poison. And here lies the danger in its use by a careless or unskilful person. In the hands of an intelligent agriculturist, salt applied to the land for cereal crops will increase the quantity, and produce heavier and firmer grain and stronger and whiter straw. For root crops its use is equally beneficial; and in rough pastures, mixed with lime, it will destroy the coarse grasses, and produce a rich herbage mixed with white clover and other succulent herbs. It is during the growth of plants of all kinds that salts are found in them in the greatest abundance; and we may therefore conclude that, in the vegetable economy, it performs in the soil a similar part that it does to the animal, although in a different manner, helping the plant to its necessary food; or, in other words, it enables it to assimilate its food, with which also it mixes in a large proportion during the time the plant is in a growing state. Water is one of the most important of the elementary substances in the formation of plants. Now, salt, according to Julius Sachs, is found by experiment to have the peculiar action on them of retarding the absorption of water by the roots, by which the soil is kept in a moist state, and a supply of water is secured to them. Sachs found that a plant placed in distilled water absorbed 175 parts in three days, whilst another plant, of the same size, placed in water containing one-half per cent. of salt, absorbed only 56 parts in the same time. This explains why salt applied to cereal crops causes the straw to be shorter and stronger. We see the effect of an unrestrained supply of water to cereal plants in the length and weakness of the straw and the liability of the crop to go down by the first high wind or heavy storm. Salt is well known to be the best dressing to prevent this by shortening and strengthening the straw.

It is, however, less our intention to show the beneficial action of salt upon cereal and other agricultural plants than upon the animals of the farm, which in this period of extensive and fatal disease is of most immediate consequence; for, although its use in warding off or modifying disease of the epidemic kind is well known, its application is still too much neglected. The necessity of using salt in food by animals of all species is shown by the proportion of it found in the blood. In that of the human subject the normal proportion of salt is found to be nearly one-half per cent., and in the ashes of blood 57½ per cent. And whether a person uses salt in his food or not, this proportion never varies. It must, therefore, be supplied from the other

portions of the body, unless it is given in the food. Now, salt is as necessary for the preservation of the *living body* from diseases as it is for its preservation from putrefaction when dead. Why is it that epidemic disease prevails so much more amongst the humbler classes of society than amongst the rich? Chiefly because the use of salt is neglected in their food. By neglecting this, the fleshy parts of the system are deprived of their due proportion of salt to supply the blood; and the consequence is, the man is rendered liable to the accessions of disease. The bile, the mucus, the saliva, the urine, the gastric juice are in this case all deprived of their due proportion of salt, to furnish that required in the blood, which *must* have its proportion whatever becomes of the other parts of the body.

Now, what applies to the human subject in this case is equally applicable to the farm animals. *Their* blood has its normal proportion of salt, without which the animal could not exist; and unless a quantity of salt is mixed with its food, the same exhaustion of the supply for the other juices of the system will take place, and the animal—whether a bullock, a sheep, or a pig—will be more liable to the attack of disease, or less likely to recover if attacked. We know not whether the veterinary practitioners have directed the attention of the farmers and cowkeepers to this subject, but it certainly is of great importance at this time, when an unprecedented epidemic disorder is decimating the herds and dairies in a fearful manner.

That the use of salt in feeding cattle is an exception in Great Britain rather than a rule, is well known by the dealers in salt, and especially the proprietors and managers of salt works. We learn from one of these latter that whilst in Germany, France, and Austria the quantity of salt given to cattle, &c., amounts to 100,000 tons, in England only 10,000 tons is so applied. In Prussia and other continental states the use of it is increasing, and in Prussia it is said to have increased threefold since 1853. Whether the absence of the rinderpest from France and Austria is due to the free use of salt for their cattle we have no direct means of ascertaining; but it is a question well worth inquiring into, how far this has been the case, and also whether those of our own farmers and graziers who freely use salt for their cattle have been more exempt from the visitation than their less careful neighbours.

That the animals themselves are well aware of the use of salt, both as a condiment with their food and as a preventive of disease, there is every reason to believe. In the Pampas of South America, the wild horses, cattle, and other graminivorous animals, travel for miles to the "salt licks," to supply themselves with the necessary proportion to keep them in health. "But," says a prize-essay we have before us, "with our animals the case is different; we keep them in either well-enclosed fields or tied up in stalls, and they must take such food as they find there, or is given to them, whether it contains the saline parts so necessary to their well-doing or not; and in some measure we increase the evil in stall-feeding by drawing out, in warm water, some of the saline matters of the food. There is no question that many

diseases our horses, cattle, and sheep are liable to would be prevented if the animals had free access to salt; and where it has been given regularly the beneficial effects have soon shown themselves. In the cellular tissues of the body, in which the flesh and fat are found, as well as in the albumen, there is constantly salt present in large quantities, showing its necessity for the production of both lean meat and fat in animals. The salt acts as a digestive by increasing the saliva, and the animals drinking water with it freely (perhaps one-third more), this additional water helps very much to dissolve

and assimilate those parts of the food which would otherwise pass off undigested, and carries off the noxious humours that show themselves in skin diseases."

We have given this long quotation to show the importance of salt in feeding cattle, and the desirableness of extending its use at this particular crisis, when the whole country is under alarm on account of the rinderpest. We shall now leave our readers to apply these remarks in their practice, which will assuredly be beneficial to the cattle, even if it does not prevent the access of the disease.

ON THE GROWTH OF FLAX.

We have frequently drawn attention to the growth of flax both at home and abroad, but the renewed experiments to cottonize flax which are making on the other side of the Atlantic induce us to return to the subject, as we have seen some very good samples prepared, although they are yet wanting in the chief elements of ultimate success.

In Egypt flax is sown in December and January, and harvested in April or May, and in Northern Russia it is sown in May and harvested in August, and so it is in the Northern parts of the United States. Flax was one of the necessities of cultivation by the Pilgrim fathers and other immigrants into North America, and by all the new settlers in the wilds of the country for the linen with which their families have been clothed. Up to a recent period almost every thriving New England farmer cultivated a small piece of land in flax every summer, and dressed it out by hand in the barn in the dry, cold days of winter, and the family manufactured it into a variety of articles of domestic use. Indeed, a good many of the old school of farmers did not think they could get along without their tow frock and trowsers, nor that anything was so fit for meal-bags as home-made linen. We fully believe that a great many who have abandoned flax culture because cotton was so cheap, may safely, in an economical point of view, return in some degree to the ways of their fathers. It is doubtful whether any other plant can be profitably substituted in any of the Northern States for flax, which can certainly be grown with profit to the grower, for its fibre alone, whenever he can be assured the average price of hemp, and that he may be sure of as soon as some of the recent inventions for separating the fibre and woody tissue have been put into general operation.

The increased culture of flax in North America has been very large, and the prices obtained most remunerative. The recent crops have been probably the best grown for many years. The improvement in flax machinery has been very beneficial to farming interests, preparing a market for the product, and as continued efforts are being made still further to improve, the Americans will be enabled largely to increase its culture. The question, can flax be used as a substitute for cotton profitably? is being extensively discussed in the States, and experiments have been made for several years in order to settle this question. The Rhode Island Society for the Encouragement of Domestic Industry offered a premium for flax cotton "fit for use or machinery," and accompanied with a statement of its culture, production, and preparation, including the cost of the various processes. The committee appointed to examine the flax-cotton

offered for the premium in their report, stated that though none of the competitors were entitled to the premium, yet that the flax prepared by Mr. Stephen Randall's process was in their judgment much more valuable than cotton in all fabrics in which cotton is now mixed with wool, and in some kinds of goods appeared to be desirable as a partial substitute for wool itself.

The legislature of the State of New York, in 1862, appropriated 2,000 dollars for the encouragement of those who were sinking by machinery to test the experiment of manufacturing flax-cotton. The New York State Agricultural Society, to whom was deputed the duty of inquiring into the matter in 1863, co-operated with a committee from the Rhode Island Society. The only competitors were the Lockport Flax Cotton Company and Mr. C. Beart, of Penn Yan. The fibres of flax are uniform in length and diameter, and fusiform in shape, the ends being acutely pointed. It is essential that these characters should be preserved, in order that they may be spun successfully on cotton machinery. The process of Claussen for making flax-cotton, which at one time was in such high favour, failed of success, because he attempted to obtain uniformity in the length of the fibre, by cutting instead of separation: the stumpy ends thus formed were fatal to the success of his enterprise. The fibres of the bast tissue are connected together by a strong adhesive nitrogenous current which has a very strong affinity for them. We believe that all attempts to overcome this connection by mechanical means must necessarily result in failure. Such efforts are as absurd as to extract grease from cloth by mechanical means. The only means of separating them is to discover some solvent which has a stronger affinity for the cement than the fibres of the flax. The report of the committee states that neither of these firms have yet produced flax-cotton in such a form as to be spun upon cotton machinery. In the best specimens of the flax cotton submitted particles of spire-wire were found adhering; the fibres were irregular in length and in diameter, and by careful manipulation almost every fibre can be farther divided, which shows that the cement is imperfectly dissolved. The committee state their conviction that the reduction of flax fibre for flax cotton is practicable. Already great strides towards the accomplishment of this has been made in the right direction, and nothing is needed but intelligent and persevering efforts to achieve a triumphant success. The committee, from their investigations, consider that the encouragements for ultimate success are too strong to allow the investigation to rest, and they recommend that at least the sum of 3,000 dollars be offered, so as to practically settle the question.

THICK AND THIN SOWING.

(TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE.")

Mr. Editor,—The observations exchanged between M.M. Seleurch and Bodin, in your number of 5th November last, page 484, and those in reply by M. Cerfbeer, inserted in the following number, page 497, have induced me to offer you my own observations—the fruit of many years' experience—upon the practice of sowing in lines, which I consider to be a question of far greater importance than is generally believed.

I must first state that I fully agree with M.M. Seleurch and Bodin upon one point, namely, that the quantity of seed must vary according to the degree of fertility the land possesses, and that thin sowing does not succeed so well as thick, upon soils in a mediocre state.

In the article which provoked this debate, M. Bodin said, "That hearing that by sowing enormous quantities of seed the weeds would be choked by the thick crop, he tried the experiment; but the results had taught him a sufficient lesson—that he had gradually diminished the quantity of seed, and that in proportion as he diminished it, the produce had increased."

M. Bodin compared the cultivator who sows thick to those who try to rear two or three times more cattle upon a meagre pasturage than they do upon a rich one. According to him sowing thick only increases the evil, and it is better to destroy weeds by second dressing and weeding, than run the risk of choking a crop under the pretence of choking the weeds.

M. Seleurch, noticing certain assertions in M. Bodin's statement which appeared to him too positive, has proved very judiciously that thin sowing is not a cause but a consequence of the fertility of a soil, and it is necessary that that fertility precede the use of mechanical sowing. His very practical conclusion is, that the proportion of seed ought always to be in inverse ratio to the state of fertility of the soil, but that that proportion should not exceed a maximum of 350 litres of wheat per hectare for poor lands, nor descend below 90 to 100 litres for rich lands. Upon most points, therefore, M.M. Seleurch and Bodin are agreed at heart.

But then M. Cerfbeer interposes by declaring that thick sowing, even on rich lands, may be a good practice; and in support of his opinion he uses an argument which appears manservable—that from 350 litres of seed spread over a hectare, he obtained a harvest of from 30 to 40 hectolitres of wheat. M. Cerfbeer found "that in soils and cold climates, where the frost often thins the seed, it is necessary to sow thick: that the spring tillering, upon which the partisans of thin sowing lay so much stress, is frequently hindered by various causes, such as drought, the scorching winds of March, &c."

In another point of view, M. Cerfbeer considers thick sowing as a certain means of preventing weeds from growing, and particularly as a more economical mode of clearing them off than hoeing.

These are the principal points of discussion. I shall first reply to some of M. Cerfbeer's arguments, and then beg your permission, Mr. Editor, to treat the subject in a more general manner.

M. Cerfbeer admits that the strongest objection to thick sowing consists in the weakening of the plants from want of space, and the increased chances of being laid in consequence; but, according to him, this double danger may be prevented, either by topping the wheats which are too thick, or by making sheep pass over it in spring, or by quick harrowing, which destroys the superfluous plants.

I have tried all three methods, and believe I am giving the opinion of most cultivators by affirming that wheats topped, or bitten by sheep, yield but a very inferior crop in grain, and always remain subject to being laid on account of the weakness of the fresh sprouts, which, after topping or pasturage, always develop themselves in a premature and imperfect manner. With regard to the use of the harrows, it sometimes succeeds; but every one knows that it is a dangerous process that cuts up where it ought to leave, and leaves where it ought to destroy; in fact, it is unworthy the notice of a good farmer.

The means advised by Mr. Cerfbeer cannot then remedy the evil, and we shall presently prove that there are other more simple and economical methods.

M. Cerfbeer's theory is, that the richer a soil is the more you may exact from it, and that the quantity of plants it can nourish is proportional to its intrinsic fertility. According to him, 3½ hectolitres of wheat sown to the hectare is not too much, and for spring cereals it is necessary even to exceed that proportion.

These figures appear inconceivable to cultivators in the North. It is evident that if all the grains sown thus came up and developed themselves, the plants would be mutually choked; and one of two things must happen—either the crop must ripen, or it must grow weak. We are aware that these agricultural facts may vary in different places, and that it is necessary to form general theories with some reserve; but in an immense majority of cases we believe we are justified in affirming that when cereals are sown very thick before winter, they scarcely ever give an abundant crop of grain. The *avortant* products are generally obtained where the plants properly spaced are uninjured, and have been able to form during winter a well-developed collar, from which vigorous tillers sprout in spring.

When the young plants are too close, they shoot up to find space, thus tending to weaken themselves, and form a gigantic stalk in spring. This stalk furnishes the tillers which should start from the collar, and which for want of space and nourishment only forms an ear without grain. Hence, those abortive tillers, which in thick crops form straggling stalks at the bottom of the sheaves, resembling hay more than wheat.

But where plants are suitably distanced, a very different effect is produced. Instead of the stalks growing in winter, the first shoots tend rather to spread themselves over the soil; the collar of each plant, being nourished by its crown of roots, soon throw out a bunch of tillers simultaneously, strengthening and increasing itself. I appeal to the testimony of all those who have observed these facts, feeling assured that they will join with me in saying it is always the crops which have tillered in the most vigorous and equal manner that resist the action of storms most successfully, and yield the best produce.

When each plant produces only female stems, the tillers become abortive, and the isolated stalk is easily beaten down; while, on the contrary, the bunch formed by four or five tillers grouped upon the collar offers a strong resistance to the storm, and what is more, in the Northern regions it is upon the tillers developed early in the spring that we always find the best-filled ears of corn. The efforts of the cultivator should, then, tend to provoke and favour tillering, which is a providential faculty given to gramineous plants, and one which ought not therefore to be hindered.

But M. Cerfbeer has said, with reason, we cannot always reckon upon tillering, as various causes may prevent it. Drought, the scorching March winds, or the action of meteors are particularly unfavourable when the land, beaten down by winter rains, has formed a superficial crust. In such cases second dressings are indispensable, and by means of the Cross-kill roller, which breaks the crust, and the harrow, a bed of dust is soon produced upon the surface of the soil, which counteracts the effect of the drought.

When the bottom of the soil is firm, and the surface well pulverized, vigorous tillers will make their appearance at the first approach of heat, unless the soil is deficient in fertility. We know that if the roots thrown out by the young plant do not meet with the necessary ailments in the soil, they cannot bring to the collar that abundance of sap which causes it to strike out tillers. It follows, therefore, that if the earth be poor it is useless putting an extra quantity of seed in, because we cannot reckon upon the effect of the tillering; but, as M. Bodin has wisely said, it is well to ask ourselves, when we have to do with land in such a condition, whether it is advantageous to cultivate wheat there at all.

Another argument of M. Cerfbeer's is, that thick crops

sometimes give very large yields. We do not deny this positively, but we accept the fact merely as an accident, not as a general rule. In order that the thick crop may escape being laid, certain exceptional atmospheric circumstances are necessary. Then it may be thinned by the winter, or by insects. Besides, in sowing broadcast (and particularly when we sow thick, for it is disastrous to sow thick in lines) it continually happens that a great deal of the grain is lost by being either buried too deep or too shallow, or by being eaten by the birds. As a proof of this fact, if in the spring we count all the healthy plants which remain upon the surface of a square metre sown broadcast, even when 3 hectolitres are put per hectare, generally speaking we shall not find these more than 150 stalks; that is to say, as many as remain at the same time when the field is sown in lines with less than half the seed. When such a reduction takes place, no matter from what cause, we have the advantages of thin sowing though we sowed thick. I have often proved this fact, but I do not pretend to say that it will take place alike upon all soils. Nevertheless, I feel justified in stating as a general rule that in sowing broadcast according to the land and their condition, at least a quarter of the seed is lost, and that the value of that seed would be sufficient to pay for weeding, the expense of which appears to frighten cultivators so much.

For the last twelve years all my cereals have been sown in lines and weeded, and though hand labour is dear in this country, it only costs me upon an average 9 fr. per hectare, and in almost every instance the dressing is sufficient. Twenty years ago we sowed 3 hectolitres upon my farm, and that practice was far from choking the weeds, for they abounded everywhere, particularly amongst spring cereals; but a few years of sowing in lines, with careful weeding, soon destroyed these parasites, which devoured the greater part of my manures.

I had besides upon my farm some fields which were sown even thicker; because, to use a local expression, they eat the seed. They were light soils, subject to shifting, and full of insects. A deep culture, and the frequent use of Crosskill, which I always use after sowing, several times in spring upon light soils, have totally changed the condition of these lands, so that the same proportion of seed distributed over others, being nearly 150 litres per hectare, is at present sufficient, a proportion which I intend gradually to reduce.

Thick sowing has then (M. Cerfbeer has shown this to everybody) the great disadvantage of rendering the crop liable to being laid, or, in other words, compromising the harvest. On the other hand, I deny that it has any good effect in choking weeds, for I see weeds invading whole countries where thick sowing is practised, and where, nevertheless, the wheat fields, particularly spring cereals, resemble draught-boards whose colours vary according to the nature of the weed that predominates. If we add to these disadvantages the loss without compensation of a part of the seed, we shall find abundant reasons for the anathema bestowed by M. Bodin upon thick sowing.

I know well that customs necessarily change with soils, and I have had too much experience in agricultural facts to try to apply the same methods everywhere; though the soils in the North are content with nearly 100 litres of seed per hectare, it is possible that it may be better to put double the quantity into those of the Meurthe. Nevertheless, my reason forbids my admitting the advantage of using 350 litres per hectare, unless, as I said before, the soil devours part of the seed, and even then I would say, rather, that the seed rots because the soil is cold and damp, and it is therefore necessary to change that state by drainage and manure; or that the seed proved abortive, because the soil was subject to drought, in which case it is necessary to use a drill that places the grain in fresh beds; or perhaps the seed is destroyed by insects, and then we have to do with a hollow soil. It will then be necessary to overturn the galleries of the insects by digging them up, and employing energetic means of compression, such as the Crosskill roller.

But I have often heard it said, we cannot sow in lines everywhere, because in some places there are no hands for weeding. In countries where there are absolutely no hands, there is no reply to the remark, though it is difficult in such places to make anything whatever advantageous, with the exception of cattle. In extensive cultures, however, we may use the horse-

hoe (of Garrett or others) which dress cereals well. But it may be seen, by the small expense that attends the manual weeding of cereals in lines, that the operation does not require so many hands, and it is well to know that the weakest hands are sufficient for the purpose.

I fear even that in certain localities we complain too soon of want of hands. We cry aloud that the manufacturers have taken away from agriculture the workmen who are so much needed; but we ought to ask ourselves whether agriculture has done all in its power to retain its population in the country. It is not sufficient to offer labourers work during the summer months only. In order that populations may remain attached to their native soil, it is indispensable that agricultural art combine and arrange its operations in such a manner as to fully occupy their time throughout the year. Now, I ask, is that the general order of things?

I shall support my observations by facts. In the North, where agricultural work is so multiplied in all seasons, the field workers do not desert their native homes. Around me, who inhabit the neighbourhood of Saint Quentin, where cotton labour sometimes threatens to take away all our hands, I have been enabled (thanks to culture in lines) to recover some workmen from the manufactures which invaded us. From the first day of March we employ workers, principally women and children, to weed the autumn cereals; then come those of spring, and the different oleaginous plants and roots, after which we have the hay harvest, and in autumn the plantation of colzas, or pulling up beetroots.

By this means we succeed in drawing to the workshop of the land hands which would otherwise be engaged in producing tissues or embroidery, and the advantage is as great to the workmen as ourselves, for we offer them more regular employment, if not higher wages, besides its being more healthy and invigorating.

The question of thick sowing is, therefore, of far more importance than at first sight it appears, embracing more than one order of thoughts and facts. The discussion which it has produced in the columns of your journal was well timed, and has led to some very useful conclusions.

Having now replied to the chief of M. Cerfbeer's observations, I shall ask your permission to treat in a more general and extensive manner the subject of sowing in lines compared with sowing broadcast, and proving that we make a bad use of mechanical drills by hindering the practice of sowing in lines.

If you think the subject would be interesting to your readers, I shall be happy to treat it more fully in a future article.

Yours, truly, F. GEORGES,
Vice-president of the Comitia of Saint Quentin.

DISPERSION OF LORD WENLOCK'S FARM STOCK AT BOURTON GRANGE, SHROPSHIRE.—This sale took place on Wednesday, Sept. 6, when the well known character of the stock attracted a large company. Subjoined is a statement of the amounts realised:—

	£	s.	d.	average	£	s.	d.
130 store ewes	536	2	6		4	2	8
90 yearling ditto.....	402	12	6	"	4	9	6
80 ewe lambs.....	184	15	0	"	2	6	4
4 aged rams.....	54	1	6	"	13	10	6
20 yearling ditto	332	17	0	"	16	13	0
28 ram lambs.....	124	10	0	"	4	9	0

By which it will be seen that the selection of 352 sheep from his lordship's flock realised a sum of £1,635 18s. 6d., or about £4 13s. for each animal. The appearance and condition of the sheep called forth remarks of general admiration, and reflected the greatest credit on those by whom they had been superintended. The "Herefords" were disposed of at fair prices. "Star," with her bull calf made £49; "Rose," with her heifer calf, £33; while the others were knocked down at figures varying from £30 to £19. The highest price for draught horses was £34. The auctioneers were Messrs. Nock and Wilson, of Bridgenorth.

HAY AND STRAW ELEVATORS.

OLD ENGLISH ELEVATORS.

The proverb, "There is nothing new under the sun," is an oft-told one, and our modern "JACK STRAWS" are no exceptions to this familiar rule; almost the only novelty in their mechanism being the application of steam as a motive power in working them. "Travelling shakers," "hay and straw derricks," "sheaf elevators," "rolling platforms," &c., &c., have been in use from time immemorial, as has already been shown in a former paper. The reader, if he has a mind, may even trace the thread of discovery backwards as far as the Tower of Babel; for the Arabs, according to the account of the practice given by Layard in his work on Nineveh, follow the same method of raising water from the Tigris and Euphrates to water their lands, that was practised in the days of the Hebrew patriarchs. A skin of water, a sack of corn, or a bundle of any kind of agricultural produce, hooked on to the end of a rope, and hauled up or elevated by means of a bullock yoked to the other end of the rope, the rope passing over a pulley at the top of a pole, is truly a primitive invention of the olden time. Poles, ropes, and rollers formed a very conspicuous part of the mechanical philosophy of the ancient school, and even down to the commencement of the present century tackle of this kind was common in every province of the kingdom. It is not at all surprising that farmers should, at a very early date, have had recourse to stacking their hay and straw by horse-power through the instrumentality of poles and tackle of this kind, in a maritime country like England or Holland, where the shipping interest afforded innumerable examples ready made, as it were, for application.

(1). In the olden time the greater number of our improvements came from the continent of Europe, and amongst the rest the Dutch method of stacking hay by horse power, on the principle of a ship-mast and yard or gaff. A mast or pole is reared and fixed by stay ropes at the side of the stack, upon which a yard or gaff is hoisted to the proper height by means of a rope or two ropes passing over, the former a single pulley, and the latter a double pulley, or two pulleys, fixed near the top of the pole. The yard turns upon the pole by means of a loop or ring on the usual ship plan. At each end of the yard or cross beam a pulley is suspended; over these two pulleys the hauling or traction rope passes, and then under a snatch block, either at the bottom of the pole or at a short distance from it, to the end, passing under the snatch block, the horse is yoked; and to the other the bundle of hay or straw is attached. When the bundle is hauled up or elevated to the height of the stack the yard turns round a quadrant of the circle, thereby swinging the bundle on to the stack. By placing the snatch-block at a distance from the bottom of the pole, the horse, in hauling up the bundle, also swings it round on to the stack. But under such mechanical condition, the bundle must either slide up a plank or a ladder with a board upon it, or else be guided vertically by the person below by means of a guide rope. This latter is the better plan of the two, as it enables the person below to pull down the rope for another bundle as soon as the elevated one is detached.

(2). In a second plan the standard pole is placed in the interior of the stack, and fixed by means of stay ropes as in the first case. Near the top of the pole a pulley is suspended, over which the traction rope works. A planked ladder is placed against the side of the hay or straw stack, up which the bundles are hauled on to the stack. In some examples the end of the rope, to which the horse is yoked, went under an anchored snatch-block, as in the Dutch plan; in others the person in charge of the horse sat upon the rope. One of our oldest and most respectable implement makers recollects sitting upon the rope in this manner when a boy, about fifty years ago, in assisting to stack both hay and straw in the valley of the Trent between Gainsborough and Newark. Most probably the Dutch colony, which settled at an early period in the lower part of this great valley, viz., the Isle of Axholme, had brought over their own plan with them, and the above is a more simple and expeditious method of carrying it

out, or of "derricking" hay and straw, as some old farmers and mechanics about Gainsborough and Doncaster technically termed the plan to us recently, than the method which is still practised in Holland. But be this hypothesis as it may, the driver sitting upon the rope merits a special notice, as it illustrates, in a very instructive manner, the principle of the controlling action of a weight to adapt the line of traction to the line of draught of the horse.

(3). In a third case the block or pulley over which the hauling rope works is attached to the rick-cloth, rope, or pole, or to the roof of a Dutch barn. The horizontal pole that carries the rick-cloth is made sufficiently strong to bear the strain upon it, which is equal to twice the draught of the horse. In other respects the details of mechanism are similar to those of the second plan.

(4). The fourth example is a reciprocating endless rope, and the improvement which it involves is evidently to obviate several practical objections to sliding the bundles of hay or straw up a planked ladder, or simply a plank leaning against the side of the stack. Thus a series of ladders, and planks of different lengths were necessary, to meet the requirements of the different heights of the stack. Again, the rope working over the top of the ladder or plank was soon worn out, while the extra friction involved increased the draught, &c. Both these objections were obviated by the reciprocating endless rope, of which there were numerous examples, all less or more different from each other in their details. Two will suffice for illustration, in both of which that portion of the system comprising the endless rope is similar. The first of these will form the fourth general example now under notice, and the second the fifth example. But before noticing either, we shall briefly describe that portion common to both, viz., a reciprocating endless rope.

The difference between a reciprocating endless rope, and an endless rope in the common acceptance of the term, lies in the working of them. In the common case rotary motion is given to one of the pulleys, which gives to the rope a continuous motion; but in the other, the reciprocating case, the two sides are pulled down and up alternately, only half the length of the rope passing over a pulley in one direction. Each pulley has a sufficient length of slack rope for fixing it, the one to the top of the pole, and the other to an anchored pulley or hold-fast below. In both the fourth and fifth cases the pulley over the stack has to be raised as the stack rises, but this is done differently, and this is almost the only difference that distinguishes the one from the other.

In the fourth example there is a pole in the interior of the stack, as in the second example, with a pulley near its top; over this pulley one of the slack ropes of the endless rope passes, the pulley to which it belongs being raised to the proper height, when it is made fast to the pole by means of the loose end. The other slack rope goes under an anchored pulley at a proper distance from the stack, where it is fastened after the two sides of the endless rope are made sufficiently tight. Or the lowermost slack rope may be fixed to a second pole, secured by stay ropes, more especially in stacking hay, as the loaded carts or waggons would then pass in freely between this pole and the stack, the bundling of the hay being performed upon the cart or wagon, or in the field on the old Roman or that of the pack-saddles of this country, mentioned by Ellis and other agricultural writers of the early part of the last century. As the stack rises the pulley over it has to be raised and made fast to the pole higher up. The pulley over the cart or wagon, or near the ground when stacking straw, remains at a uniform height; but when the opposite pulley is raised it requires to be undone, an increase of slack rope below being necessary each time the other one above is being shifted higher. The endless rope is sometimes worked by one hauling rope, but two are preferable, being much more expeditious, the one being attached at the upper pulley, and the other at the lower pulley on the opposite side, the two hauling ropes being thus attached at the two points to

which the bundles are alternately hooked on. The other ends of the hauling ropes either pass under snatch-blocks, as in the first case, or carry the drivers, as in the second.

Straw was usually bundled in the common way by means of slings, as in stacking; but hay was sometimes elevated in nets, in other examples in rude baskets, made partly of rope and partly of wickerwork, and capable of holding from one to two hundredweight at a time.

In working the endless rope by means of two hauling ropes the horse had to be yoked and unyoked to and from each alternately. Thus, when a bundle was hooked on at the lower pulley, the horse was hooked on to the opposite one, whose point of attachment when hauled down to the lower pulley elevated the bundle right over the stack, which was then struck off. The horse was then unhooked from that rope, turned round, and hooked on to the other, during which time a bundle was hooked on the opposite side to the point of attachment, a ring or hook brought down when the horse made another journey outwards, thus elevating the second bundle, and so on the work of elevating or "derricking" would proceed. When only one hauling rope is used, the opposite side of the endless rope has to be hauled down by manual labour.

(5). In the fifth example the upper pulley of the endless rope tackle has, instead of a loose or slack rope, a hook, which is hooked on to a ring on the horizontal pole of the stack guard, used for carrying the rick-cloth, as in the third example, this pole and pulley being raised and lowered in the same way as the pole and rick-cloth are raised and lowered. In other respects this example is similar in its details to the last, the fourth. In one respect, however, it differs from the third, inasmuch as the horizontal or cross-pole must either work up and down upon the two vertical standard poles at the two ends of the hay-stack by means of rings or hoops, as in the old Kentish stack guard, noticed by Marshall, London, &c., or else it must extend somewhat beyond the vertical poles at each end, and be made fast to them by a rope, similar to the manner builders fix their cross-poles to their vertical ones. But here we may observe that the reciprocating endless rope does not require to be made so tight as the common ones, nor is it so liable to get out of working order.

(6). Williamson, in his work on "Agricultural Mechanism" (plate v., p. 111), gives an illustrated description of loading carts or waggons by means of a simple derrick crane, consisting of two poles and a winch, and we believe something of the same kind has been tried in stacking hay and straw. Thus one tells us he once saw a farmer stacking hay by means of a single pole outside the stack, with a pulley and rope, as in the second example. Now in this case the top of the pole or two poles, as in William's case, must have had a to-and-fro motion, in order to throw the bundle on to the stack, and to raise it free from the side of the stack, as no planked ladder was used. Emmerson, in his work on mechanics, gives an old plan of raising water from a river at the bottom of a deep valley to a farm-house above by means of what sailors call "a traveller" upon a rope made fast at both ends to two posts, one post being at the bottom of the steep incline and the other at the top; and the same plan has been proposed in conversation for stacking hay and straw by horse-power, but we have not met with any actual examples of its having been carried out into practice.

(7). The seventh example is an improvement upon the old ship-mast or "gaff-hoist," and now known in the United States of America, where it is extensively in use, as the "derrick elevator." The improvement upon the Dutch plan consists in making the cross-beam or yard turn upon a pivot on the top of the vertical pole or standard at the side of the stack, and in the giving of it a foot to stand upon, so as to do without stay-ropes. In other respects the details of mechanism and working are similar to those of the old plan, at least in principle.

To the above seven examples a great many varieties might be given, that which distinguishes the latter from the former being chiefly the mode of putting on the ropes, and yoking the horses. With a very little difference in the mode of arranging the tackle, two horses may be employed in each example instead of one, thereby performing nearly double the amount of work in a given time. Thus in the first and seventh plans bundles would be raised at the ends of both arms, which would then have to swing round in a semicircle on to the stack, in-

stead of a quadrant, so that as the one horse would be hauling outwards the other would be returning to the stack. And with very little difference these general data will apply to the other five examples.

About the commencement of the present century the above plans of stacking hay were generally known in most of our hay counties, and a few isolated examples were in operation at a very recent date. In our last paper of this series, under "American Loaders and Stackers," it was shown that "the horse-fork" has superseded the old bundling system in stacking hay, and in one or two examples the same result in the march of improvement has taken place in this country. But the practical reader will readily perceive that the hindrance in hay-harvest is not the pitching of the hay in the stackyard, and that, even if it were, the old method of tying it up in bundles would not much expedite the work. Query, therefore, as many intelligent practical men recently interrogated us in the provinces, when searching for the above methods of the olden time, "What is the use of them?" "Get you upon one wagon," said a Yorkshireman, "and I shall take a second, and pitch my load on to the stack in half the time you will bundle yours." In short, we had to take our intelligent practical friends back to a period in the French wars, and in the prosperity of our manufactures, when able-bodied men fit for pitching hay were scarce in our hay districts and with difficulty to be had for money; and to the agriculture of the Romans, who handled all their hay in the field; and to that of pack-saddles in this country, when the hay was carried home on the backs of horses in bundles, &c., when the practical rationale of stacking by horse-power was readily understood. But subsequent to the peace at Waterloo hands have been plentiful, consequently the practice fast got into disuse, so that farmers now are few and far between who know anything practically about it, unless in the immediate neighbourhood of the exceptional individuals who have kept it alive to this day. In America, where wages are high and hands scarce the reverse has been the result, the practice there during the last twenty years having been greatly extended. In this country the progress of steam power is greatly enhancing the value of the old plans, promising at no distant date to carry them into universal use.

PAST MECHANISMS AND FUTURE COMBINATIONS.

In concluding this short series of papers, we propose briefly to review the progress farmers have hitherto made, and the line of improvement which present methods of stacking hay and straw indicate for the future. In taking a true meridian of our present position, the field which the eye has to survey retrospectively and prospectively is a very extensive one, the two views being widely different from each other in many respects. Recently, when conversing on the subject with several large farmers of long experience, and whose apprenticeships in not a few cases were served during the last century, we had to go into a lengthy explanation before they could understand the practical rationale of stacking hay by horse power, as their horsemen, they said, "could pitch it more expeditiously from the carts and waggons by forks." But when we took them back to the hay harvest field of the olden time, they at once recollected the "crooks," "packsaddles," wooden forks, and tackle with which their forefathers, and not a few of themselves in early life, used to harvest hay. When the "trolley" was first invented, it was doubtless considered a crack improvement by the go-ahead farmers of that day, but "a while-away-time" affair by those who had been accustomed to gallop to the hay-field with half-a-dozen or a dozen of empty packs and crooks, to get them reloaded "in less than no time," so to speak. Marshall, in his Rural Economy, says it was dangerous to meet the boys with the empty pack-horses returning from the hay barn or stack-yard to the field, they galloped at such a thundering pace. And it must also be remembered that at that period a large extent of the hay crop was stacked in the field in which it was grown, for the purpose of being consumed there, in order to manure the land with the droppings of the cattle. In those simple times, our forefathers, on the score of economy and good husbandry, concluded that hay should be consumed in the field where it was grown, in order that *fairplay may be done the land*. In such cases the hay-stack was built in or near the centre of the close, the hay being drawn to the stack by ropes, nets, and "sweeps" of va-

rious kinds from the windrows, not a pack-saddle, trolley, or cart being used. Young, in his Survey of the County of Lincoln, writes rather uncharitably of these old practices in his time, when he says, "Everything in laymaking that I have seen in Lincolnshire is barbarous." And again: "In this tract" (between Sutton and Alford) "I saw them drawing hay from all parts of the field to the centre with horses and ropes, in order to form a stack without the trouble of carting. The frame for this work, a plate of which I inserted in my Northern Tour, is much superior." The frame here referred to is simply a "hay sweep," and we quote the above to show the author's opinion of the march of improvement at the period he wrote.

Looking backwards over the footsteps of progress, the reader will thus perceive that our modern hay-carts are an improvement upon the trolley (a low four-wheel carriage); that the trolley was an improvement upon crooks and pack-saddles; that the hay-sweep was an improvement upon ropes and nets, and (going another step further back in the march of progress), that carrying hay on the backs of horses was doubtless considered a decided improvement upon the more primitive plan when the sturdy yeoman of old England carried home what hay they required for winter use upon their own backs in bundles, as poor people in our own day carry it from hedge and ditch sides to where they stack it. The progress of fact, when clearly seen, is therefore obvious enough, and readable, to the most plodding practical capacity.

The above has reference chiefly to the implements employed in the hayfield. We have next to take our readers to the hay-barn or stack, in order to see the progress that has been made in the work of stacking. Thus we are told, in one of the County Surveys to the Board of Agriculture, that the common "*stack-guard*," or "*rick-cloth*," such as "Edgington's," is a mechanical equivalent, if we may so speak, of the modern improved "*Dutch hay-barn*." And that our old close hay-barns are bad copies of the old Dutch barns. Now, the stack-guards, a reader is aware, consists of two vertical standard poles, one at each end of the hay-stack, with a horizontal pole extending between them, for carrying the rick-cloth, the whole forming a temporary roof to the stack, which is raised and lowered by pulley tackle at each of the vertical poles, according as circumstances require. The modern improved Dutch barn, on the other hand, has a permanent roof of some kind, as of thatch or tile, which is raised and lowered by means of four standard poles, one at each corner of the stack, which for stacks of uniform size as to length and breadth has many things to commend it to attention—things suggestive of future improvement as to permanent stack-roofs.

Again, we must not pass over altogether unnoticed the improvements that have been made during the current century in pitchforks, hay-rakes, tedding-machines, stack-stages, scuffolding, and the like, with the peculiar practices to which such improvements have given rise in times of peace, with a plentiful supply of hands as compared with military times, when harvest hands were scarce; but into details on this head we need not enter farther.

Now, all these elements in the march of mechanism must be duly taken into account before we "hitch on a horse" (using a Yankee phrase) to the end of a rope, so as to stack hay by horse-power. And if this was the practical rule that had to be observed by our forefathers, it was still more so in Holland, where able-bodied hands were more frequently removed from the harvest-field by the demands of war, extensive fisheries, &c., &c., Holland being the country from whence we imported very many of our improvements in every branch of agriculture. Such, then, being the facts of the case, we have only to go back to the hay-harvest of the olden time, to see the *rationale* of their rise and progress. Thus, in carrying with pack-horses, it would be more expeditious to have the hay in the field ready tied up in bundles, say three bundles to each horse, one on each side, and one above between. If there were twelve horses, they may be divided into three teams of four each, a boy being required to each team, the horses following at each other's tails. During the short interval between the loading of the teams, the hands in the field would tie up into *net slings* twelve bundles. Two active men, with women to keep the raking close up, would do the work and swing up the bundles between them, one at a time, on to the pack-crooks, as fast as the boy could turn round the horses; when away the team would go at a jog-trot to the hay-barn or stack in the stack-

yard. Arriving at the mow or the stack, there would not be two opinions as to how the bundles ought to be elevated, provided the farmer himself was anything of a mechanical genius, and had the means to get the blocks and tackle to do the work; for at every seaport or shipping place, or canal, or river, the common mode of hoisting would suggest the practical rule to be adopted, more especially amongst our Dutch settlers, who had seen the practice in operation in Holland. Hence, the origin of "*derricking hay*," as some old farmers in the valley of the Trent about Gainsboro' and Doncaster term the practice of stacking hay by horse-power to this day. In stacking hay in the field the details of practice would be somewhat different at the commencement, as the hay near the stack would be more expeditiously collected by ropes, as seen by Arthur Young, in Lincolnshire, or by "*frances* or *hay-sweeps*," as he recommends; but in cases of large fields, or where the hay of several small closes was stacked in one, it would be preferable to bundle it, and carry it to the stack by pack-saddles, as the land could be cleared in less time, while there would be less waste of hay and aftermath.

It will, no doubt, be said that the old practice thus described was the exception, a more slow and slovenly wasteful one being the general rule. This must be granted, for when the hay was carried from the windrows it was put upon the crooks by pitch-forks, and an amount of time spent in loading that would worry to death our reader's patience to hear it told. When carried from the small cocks an attempt was generally made to lift two or three of them bodily into the crooks. But we need hardly tell the practical reader that these same small cocks could have been bundled and loaded in less than half the time.

We have said enough under the last paragraph to show the reader how great an improvement the trolley must have been considered to the general pack-saddle practice; and the modern waggon and hay-cart to the trolley, as the practice of stacking hay in the field was given up, and as hay-rakes and tedding-machines were brought to bear upon the economy of field operations. And we need not inform the practical reader that these improvements all militated against the old practice of derricking hay in bundles by horse-power, unless in examples of very high stacks with a paucity of hands, and also in hilly countries in the absence of roads for wheeled carriages.

The introduction of portable thrashing-machines has had an opposite effect upon straw-stacking apparatus; the thrashing out of large quantities at a time having increased the demand for mechanical means of this kind, so as the better to secure and economise the straw in large stacks. And the application of steam as a prime mover has greatly stimulated the march of improvement in this direction. The stacking of straw is a smotheringly dirty, killing work, often requiring extra wages to get hands to do it in anything like a passable form. In many cases the shapeless stacks and shameful waste of straw are all but indescribable. It is, therefore, rather surprising that so little should have been done between the time of Gladstone's "*travelling shaker*"—say the one erected for the Earl of Selkirk, in 1809, and that of Cornes's combined shaker and elevator, exhibited at Leek and Northampton in 1836 and 1847. But if progress has been slow during the long interval between these two periods, the same thing cannot be said of the present time, for we are now moving at a Derby-Day-galloping-pace, in almost all directions imaginable that lead to the top of the hill.

Before letting loose the reins of the steam-horse into the future, it will be advisable to examine somewhat more closely our modern elevating mechanisms, English and American, from an elementary point of view. Thus, in the old ship-tackle method of derricking hay in bundles, we have nearly all the elements of the modern American derrick elevators. In both examples the hauling-rope passes over two pulleys on the cross-yard and under a third pulley, below. In both, the bundle rises vertically, and is swung on to the stack by means of the cross-arm turning on the mast or standard pole, or the cross-pole turning with the mast. And the reader who has seen trussed-hay hoisted on board any of our war transports, or on our coasting craft, such as import hay from Holland in dry seasons, as 1826, when large quantities were brought over, will readily perceive that both are close copies of the ship-mast-and-yard hoist. In point of fact, it would not be difficult to prove that the old ship-masts and yards with their tackle have been purchased by Dutch and English farmers,

put up, and employed in elevating hay and straw on to the stack.

Again, the problem of self-bundling and discharging apparatus, that is now engaging the pioneering talents of both English and American inventors and patentees, is a very old one. Up to this date, to the best of our knowledge, the problem has been only half-solved, *i. e.*, both parties have succeeded, by mechanism closely similar in principle, of making the bundling apparatus discharge its contents when and where they please upon the stack; and the first example of this kind which we saw reported was an American, a non-patented case, in one of the agricultural periodicals of the United States, which comes to England in exchange for our agricultural papers, and to relatives.

The next elementary mechanism now being improved upon, to which we shall turn attention, is an *inclined plane*, up which hay and straw is being elevated on to the stack. This, in the old ship-tackle examples which we have given, was a plank upon a ladder; as the stack increased in height a longer ladder and plank was required, and so on. Up this inclined plane the bundles of hay and straw were hauled on to the stack. Up this simple inclined plane the American horse pitch-fork works, elevating at the rate of 6 tons an hour, and may now be seen in operation in this country as well as in the United States. For elevating straw from a thrashing-machine the endless rake, American and English formerly noticed, is doubtless an improvement; but when we examine an endless rake and the inclined plane up which it elevates the straw from an elementary point of view, it amounts to so many horse pitch-forks upon two endless chains, sliding the straw up a plank, while the trap-doors in the inclined plane of Tuxford and Son's elevator corresponds to the series of ladders and planks of different lengths to suit the different heights of the stack. In all these examples the elements of progress are palpably manifest.

If we turn to poles and pulley tackle we shall find the footsteps of progress equally visible. Thus we have a reciprocating rope over a fixed pulley, as in the case of the old examples of a pole in the stack, and the modern examples of the American horse-pitchfork, when the pulley is fixed in the roof of the barn or the apex of a triangle over a stack.

We have in the next class a reciprocating rope over a moveable pulley, as in the old example of a "ship-yard hoist;" and in the modern examples of the American horse-pitchforks, where the pulley can be lowered, as when suspended from the

roof of a Dutch barn, or from the cross-pole of the stack-gard, the latter being the only example of the American horse-pitchfork which we have heard of being in use in this country.

Next we have to notice endless ropes, and endless bands over both fixed and moveable pulleys in endless variety, old and new. Luck and Campaign in their specifications, 1859, take their copies from steam-plough tackle, *viz.*, a reciprocating rope over a moveable pulley, running off and on upon a winding-drum, or off one winding-drum on to another; but like most successful methods of reducing the proposition of the latter to practice is that of an endless rope as illustrated in Clayton and Shuttleworth's catalogue, which possesses considerable novelty in its details of construction, evidently not included in the patentee's specification, owing to the prior use and publication of endless rope elevators on the bundling principle.

In the next class of examples to which we shall turn attention, the endless band elevator, toothed or plain, is in itself the inclined plane up which the hay or straw is carried on to the cart, mow, or stack. In this respect it is a totally different mechanism from the fixed inclined plane up which the hay or straw is raised, either by reciprocating or endless rakes, and it involves equally different principles. It would be superfluous to go into the details of these differences, as they must be manifest to the reader. It will no doubt be said by some agricultural tyro, that the endless band is not an inclined plane. This may be granted in the sense meant; but what follows? The manifest conclusion that the one is, after all, as different from the other as carrying hay up-hill upon your back is to tossing it up-hill with your feet.

Such are the elements of past progress; for the future appears to be more a question of combination than one of individual parts, and the lint thus given to English inventors is equally applicable to those of our colonies and the United States of America. To those who have thrashing-machines the stacking of the straw by machinery has become a *sine quâ non*. In short, every thrashing machine, portable and fixed, must now have an elevator for the stacking of the straw. In England little has yet been done in hay harvest; but after the stack gets above the cart, steam may profitably be employed to work the American horse-pitchfork, or clutch fork, for they have two kinds of them, and if once started at the rate of 6 or 10 tons an hour, economical farmers will naturally ask, *Why not pitch the whole by steam?* ENGINEER.

EXPERIMENTS IN THE CULTIVATION OF MANGEL WURZEL.

It is purposed in the following paper to give the results of experiments in the cultivation of mangel-wurzel, in the season of 1862, which at this period may not be without some interest to the reader. The soil on which the experiments were conducted is a light sandy loam, resting on the ferruginous sand and sandstone of the lower oolite, variously tinted by the oxide and silicate of iron. The land on which the experiments were made is situated at an elevation of 325 feet. It consisted of about eight acres, and formed one side of a twenty-acre field. The farm is managed on the five-course system; consequently, the preceding crop of 1861 was barley, and that of 1860 wheat, that of 1859 mixed clovers. During the whole of the summer of 1859 the land was grazed by sheep, which had a daily allowance of cake or corn, so that the land was in good condition. As regards manure, the barley in 1861, at seed-time, received a dressing of 3 cwt. per imp. acre of phosphatic manure, specially prepared for this crop; and during the autumn of 1861 the land was thoroughly cultivated twice over with Coleman's cultivator, then harrowed and rolled, and all weeds were carefully collected and burned. It was ploughed up to the depth of ten inches about the middle of December; in this state it remained till the first week of April, when it was crossed with Coleman's seven-tined cultivator, working to the full depth of the plough. It was then cross-ploughed, harrowed, rolled, and thoroughly pulverized, and was reduced to a fine state of tilth by the end of April. The ridges were opened with the double mould-board plough, on the 2nd and

3rd of May, to the width of 27 inches. On the 5th and 6th of May, 20 loads of rich farmyard manure were drawn out and spread in the ridges. This manure was the produce of bullocks eating daily 60lb. of good swede turnips, 4lb. linseed-cake, 6lb. of meal (bean and barley), with about 14lb. of cut chaff, two-thirds straw, to one-third hay. The beasts were tied up in feeding hovels, from which the dung was cleared out daily into an open yard tenanted by young stock eating straw and turnips. Three weeks before it was used, the manure was turned and well watered with the liquid drainings collected in a tank in the yard, the buildings being all spouted. This liquid consisted principally of the urine of the cattle. The farmyard manure was spread in the ridges in the usual way, and over this was sown broadcast specially prepared mangold manure in the proportion of 2½ cwt. to the acre, and the whole was covered in with the double plough. The artificial manure was analyzed by a competent chemist with the following results—

Moisture	8.11
Organic matter	25.93
Silica	3.66
Soluble phosphate... ..	20.94
Insoluble phosphate	14.76
Sulphate of lime	26.60
Nitrogen	3.03
(Equal to ammonia)	3.97

This manure costs £7 15s. net cash, delivered at the nearest

railway station. The seed, yellow globe, was steeped for twelve hours in rain water; after which it was put into a sack, where it was kept at a temperature of ninety degrees for three days, when most of it had started. In this state it was sown on the 6th May, in the proportion of 5lbs. to the acre, by means of a two-row turnip-drill, having a seed-box specially made for sowing mangold, and which deposits the seeds from cups instead of the brushes generally used for turnip-sowing. This box is simple and inexpensive, and, if required for turnip-sowing, brushes can be readily substituted. We have tried different methods of sowing, dibbling, and drilling mangold; but for cheapness, regularity, and uniformity of depth—the three great desiderata—we find nothing equal to the system above described. When we committed the seed to the earth, the weather was showery, and the soil in a favourable state; but owing to the moist state of the land, the ridges could not be rolled down till the 13th May, when, notwithstanding the land was much beaten and washed by the recent rain, several plants had made their appearance above ground.

By way of experiment, two ridges in the middle of the plot were sown with seed unsteeped, from the same bulk as in the case just described; this was sown the same day as the other, viz., May 6; but the plants did not make their appearance above ground till the 22nd May. On the 28th, our note-book contains the following entry: "Young plants looking healthy, and grow fast; on the same day began setting out plants." This, in our locality, is generally performed by men, who with a hoe cut the plants out at regular intervals, the blade of the hoe varying in width with the distance the plants are to be left apart: one or two inches are left between each stroke of the hoe. The hoer is followed by a small boy or girl, who singles out the plants, care being taken to leave the strongest and most healthy looking.

The distance from plant to plant should vary from twelve to eighteen inches, according to soil and other circumstances. In our locality, we have proved by repeated experiments that the heaviest crops can be grown on ridges 27 inches wide and 12 inches from plant to plant. We prefer having all our root crops singled by day work, as we generally find the work much better executed, there not being the same inducement to scamp the work that there is when working by the piece, particularly where the labourer is migratory and of unsettled habits. An ordinary hand, with a boy or girl to single the plants, will easily get over half an acre per day in a workmanlike manner; an experienced hand will do considerable more, and will vary in cost from 4s. 6d. to 5s. 6d. per acre, according to the rate of wages in the district. As soon as the young plants make their appearance above ground, we freely use the horse-hoe, stirring the soil, frequently and deeply. Soon after the plants were set out the first time, they were attacked by the mangel-wurzel fly—*Anthomyia betæ*—which has greatly injured our crops for the last two years, and was quite unknown in this neighbourhood previous to 1860. As yet, we have found no means of preventing the ravages of this destructive pest. The fly deposits its eggs on the under-surface of the leaf; the maggots, as soon as they are hatched, eat their way into the middle of the leaf, feeding on the pulpy substance, and destroying its vitality. When a crop is attacked, the leaves soon present a brown and scotched appearance. On the 17th June, they were gone through the second time with the hand-hoe, and all weeds carefully cut out from between the plants; the horse-hoeing was continued at regular intervals of about a week. Being aware of the importance of nitrogen to the mangold crop, on the 21st of June 1 cwt. of nitrate of soda and 2 cwt. of common salt per acre were sown broadcast on four acres, in order to test the efficacy and results of nitrogenous manures on the production of this crop; the weather being showery at the time, was extremely favourable for its application, and, the horse-hoe being immediately used, the manure was all either covered or dissolved. July 23 and 24, the whole of the eight acres were subsoiled between the ridges, twelve inches deep, with Gray's subsoil plough, drawn by three horses. July 24, on two of the four acres where the nitrate of soda and salt were previously applied, we again put on a second dressing of 1 cwt. per acre of nitrate of soda, using the horse-hoe to cover it in as before.

The system we have long pursued of preventing the plant from running to seed is this: As soon as they show any appearance of seeding, a careful man is sent through the crop, who with a sharp knife cuts off all the seed-stems close to

the crown of the root; and, if carefully watched and cut off during the early stages of their growth, little damage is done. We found by our experiment, where the seed was forced, a far greater percentage of the plants showed signs of running to seed than where the seed was sown in the usual way.

We always store our mangold crop between the 20th October and 10th November, according as weather and other circumstances permit. At this season, the days are longer; consequently, more work can be accomplished. There is also less danger from injury by frost than at a later period. The way we have long followed in getting up and storing the crop is to let the work to a trusty man at a fixed price per acre, he finding a number of boys who pull up the bulbs, cutting off the tops and leaves not very close to the crown. The whole of the roots are left on, as we find them keep much better than if trimmed and wounded, causing the bulb to bleed, greatly injuring the quality, and, at the same time, rendering it more subject to decay. The bulbs are thrown four drills or rows together, in the same way as turnips, the man and his gang filling them into the carts when drawn off. The usual price we pay is 2s. 6d. per imperial acre. The work cannot be done by men at less than from 10s. to 13s. per acre. In storing, we always endeavour to draw them as near the place where they are intended to be consumed as circumstances will permit. They are stacked or pitted on some dry spot as well sheltered from the north winds as possible. The heaps are made 6 feet wide at bottom, sloping to a point at an angle of about 45°. They are sometimes covered with straw and a slight covering of earth; but, where straw is plentiful, we greatly prefer that covering only. Our system is to cover with about 2½ feet thick of any short straw or stubble, then thatch neatly down with some good wheat or barley-straw, taking the necessary precautions to secure it from being blown off by wind. In this way, we have for many years stored large quantities with but trifling losses from frost or other causes. Even during the severe winter of 1860-61 our crop had no covering but straw; and from upwards of eighteen acres we had less than a ton of rotten or spoiled roots. Although we have never for the last fifteen years used earth as a covering, we have often seen our neighbours lose great quantities from over-heating in the pits when so covered.

Before storing the crop we carefully took up, topped, cleaned, and weighed a part of each lot—viz., that which received one dressing of nitrate of soda, that which received two, and the lot manured in the usual way. From considerably extensive practice in testing the weight of root crops when growing, we find that the fairest system of ascertaining the true weight is to select an average of the crop. When that is satisfactorily determined, measure forty-six feet, taking a ridge for the line or hypothenuse of a triangle; then take sixty-six feet, or one chain in length. Place each end at the marks before set up on the base line. A man taking the chain exactly by the middle pulls it tight; another man with a sharp spade passes along and divides all the roots where the line touches. The same operation being repeated on the other side gives an area of four square poles. The roots are then got up, cleaned, trimmed, and weighed. They are weighed in quantities of 56lbs., that weight being the same fraction of a ton that 4 poles is of an acre; consequently, each weight of 56lbs. is one ton per acre of crop.

We have found this plan greatly simplify the weighing of all root crops, and prevent many errors and mistakes which frequently creep into the calculations. In measuring one or two poles in the same direction as the rows run, it is often found difficult to know with sufficient certainty to which side some of the roots should belong; so that a small error, when multiplied one hundred and sixty times, may swell to considerable magnitude in the end. On weighing an average, four poles of the two acres which received two dressings of nitrate of soda, the bulbs closely trimmed and cleaned, the produce was 28 tons of bulbs and 8 tons 13 cwt. tops from 18,180 roots. No. 2, which received only one dressing of nitrate of soda, produced 26 tons 12 cwt. 2 qrs. 4lbs. clean bulbs and 7 tons 5 cwt. 1 qr. 12lbs. tops from 18,080 roots; while those that were dressed with farmyard manure and nitro-phosphate produced 22 tons 12 cwt. 16lbs. clean bulbs and 5 tons 11 cwt. 20lbs. tops from 18,020 roots.

The appearance in favour of the double-dressing of nitrate of soda over the farmyard and phosphate manure only, was 5 tons 2 cwt. 3 qrs. 12lbs. bulbs and 3 tons 1 cwt. 3 qrs. 12lbs.

tops, at an extraordinary outlay of 20s. The difference in weight between that which had a double and that with a single dressing was only 1 ton 3 cwt. 1 qr. 2 lbs. bulbs, and 1 ton 8 cwt. 3 qrs. tops; while the difference in favour of 1 cwt. nitrate of soda over that which was done in the usual way was 4 tons 1 qr. 16 lbs. bulbs, and 1 ton 14 cwt. 20 lbs. tops.

The mangold, like the turnip and all other root crops, varies in feeding properties according to soil, climate, manurial effects, and other circumstances under which it is cultivated. According to chemical analysis, it is more valuable for feeding purposes than the common turnip or swede. In practice, during the autumn and early winter months, we consider it inferior in feeding value to good swede turnips; whilst during March and April, and as the season advances, we consider it almost invaluable, not only for feeding, but as food for store stock. We have used it rather extensively for some years, when pulped and mixed with cut straw, and allowed slightly to ferment, in which case chemical changes take place, enabling the animal more easily to assimilate the substance of the food. We have used and found the roots equally valuable for ewes suckling their lambs, and for dairy cows in milk, always producing an increased flow of milk; and when given in conjunction with oats, beans, and other nitrogenous foods, the quality of the secretion is not deteriorated in value. The mangold being originally a native of a warmer climate than that of the United Kingdom, and other things being equal, we invariably get our best crops during dry, hot summers. The past

season was therefore unfavourable for the production of heavy crops of this root. Ours was greatly under an average of former years. For the benefit of those who may wish to extend its cultivation to cold districts with a large rainfall, we will state the mean day and night temperature, and also the quantity of rain which fell here during the season of 1862, from April to November inclusive—

	Mean Day.	Mean Night.
April	55.66	39.83
May	64.67	47.45
June	62.23	48.05
July	65.04	51.25
August	62.02	51.25
September	60.96	49.36
October	58.04	44.87
November	42.76	33.00

	RAINFALL.	Mean Inches.
April		1.40
May		2.96
June		2.31
July		2.45
August		1.61
September		2.47
October		2.65
November		0.77

—*Scottish Farmer.*

G. MURRAY.

THE TRETHERY TESTIMONIAL.

In the course of last year it was felt by some of Mr. Tretthewy's friends that the general feeling of esteem with which he was regarded ought to find expression in some tangible form, which should at once mark their sense of his honourable character and personal worth, and of the services he had rendered to agriculture; and on the matter being mooted it was heartily taken up, it being justly felt that never was there an instance in which such a tribute to those sterling qualities which commend men to the regard of their fellows was more deserved. After mature consideration, it was resolved that a portrait should form part of the testimonial, in order that future ages, long after he has passed away, may be afforded the opportunity of viewing the lineaments of one now so highly esteemed, and who has trod the path of duty so well. Mr. J. P. Knight, R.A., was the artist selected, and we have no hesitation in saying that he has succeeded in producing a likeness which, whether regarded as a faithful life-like representation of Mr. Tretthewy, or as a splendid work of art, is one of the very finest pictures of the kind ever seen in the county. So highly does the artist himself regard the portrait, that we understand he has expressed a strong wish that it may be sent to the next exhibition of the Royal Academy; and we are informed, that wish will be complied with. In addition to the portrait, six massive and elaborately chased silver salvers, and a tea and coffee service, also of solid silver, the whole weighing 550 ounces, were purchased out of the subscriptions; one object being that Mr. Tretthewy should be afforded the opportunity of leaving to each of his children a piece of plate which would show to those around them the high estimation in which their father had been held; but, at the same time, this has been left to him entirely as a matter of choice, no stipulation or request upon the point being made. The largest of the salvers bears the following inscription: "Presented, with his portrait by J. P. Knight, R.A., to Mr. Henry Tretthewy, of Grampond, by a large number of landowners, yeomen, and friends, as a mark of their high esteem, and in grateful acknowledgment of the substantial services he has rendered to agriculture, particularly in his native county of Cornwall. September 12th, 1865."

Tuesday last being the day selected as that on which the presentation of the testimonial should take place, a number of gentlemen were appointed as stewards to carry out the preliminary arrangements for celebrating the event in a becoming manner. A dinner, of course, formed a necessary and im-

portant ingredient in the day's proceedings. As the Council Chamber was considered the most suitable room in the town for the presentation and dinner to take place in, and on the Mayor of Truro being applied to, he at once kindly placed it at the service of the committee. A few of the gentlemen who had provided themselves with tickets were unable to attend, so that not more than 170 sat down. At half-past two o'clock Mr. P. P. Smith, the chairman of the testimonial committee, entered the chamber arm-in-arm with Mr. Tretthewy, and were greeted with enthusiastic and prolonged cheers. Mr. Smith took the chair, and Mr. John Gatley the vice-chair. On the right of the chairman were Mr. Tretthewy, with Messrs. William, Henry, and Alfred Tretthewy sons of Mr. Tretthewy, and some of the chief agriculturists of the county of Cornwall. After the customary loyal toasts had been given,

The CHAIRMAN said: Mr. Vice-Chairman and gentlemen, it is now just twelve months since my friend Mr. John Gatley called on me, and asked me to attend a meeting of agriculturists who were anxious to consider in what manner they could best evince their appreciation of the eminent services which, throughout a long and useful life, had been rendered to agriculture in this county by my friend—my much respected friend—Mr. Tretthewy, of Grampond: services, gentlemen, which had deservedly earned for him the title of "the farmer's friend." I most heartily accepted the invitation; but when I found that it was proposed that I should be the chairman of the committee, I urged the selection of some gentleman of greater influence than myself; and it was not until I found that it would be considered churlish in me if I longer resisted, that I yielded to that which appeared to be the unanimous wish. But who on that occasion could have pictured the scene which I now see before me? If I could have realized it, I should have shrunk still further from occupying my present position; and when it was proposed that the proceedings should take the form they have done to-day, I again struggled to be released, but I was met by the declaration of the committee—the chairman is expected to do his duty. Gentlemen, I feel that the choice which your committee has made will not be ratified by the general voice of this large and influential company ("Yes, yes," and applause). I fear that my friend Mr. Tretthewy, and his friends, will think that some man of greater mark than myself should have been entrusted with the gratifying task which has been assigned to me ("No, no"). My explanation, however, is made, and if I cannot

venture to hope that it will be satisfactory to you, yet I trust that it will at least meet with the same kind indulgence which personal explanations always receive elsewhere; I mean in the greatest assembly in this country—the British House of Commons. I thank you for that warm and generous cheer, because it gives me encouragement to proceed. But I quite agree with my friend Mr. Wise, that there are men in this country who, although they have never rendered themselves illustrious by their achievements in arms, or famous by their works in art, or by their productions in literature, yet have by the very force of their character drawn themselves out from the ranks of their fellow-men, and become so conspicuous by their good actions, and by their usefulness in their generation, as to call for some lasting memorial of their worth. Such a man is my friend on my right, Mr. Trethewy (loud cheers). Of all the eminent agriculturists in Cornwall, and there are many of them, he has by universal consent been considered to be the greatest living benefactor to the interests of agriculture in his native county (cheers). And, gentlemen, let me say that his reputation is not confined to the county of Cornwall, for it extends to every portion of the kingdom in which agriculture is cultivated as a science (loud cheers). Gentlemen, Mr. Trethewy's career has been one of unblemished honour (cheers). It has been fraught with lessons, with useful lessons, to all of us; for I can never believe that he would have attained his present position if he had not kept steadily before him the maxims of self-reliance and self-help (cheers). You know that Mr. Trethewy is the steward—and the successful steward—of one of the largest properties in this county. For upwards of half a century he has been connected with that property; and when he succeeded to the stewardship, Mr. Hawkins, the owner, was a minor. When that gentleman attained his majority the estate was handed to him, excelled by none in this county for good farming, good tenants, and lasting improvements (Hear, hear). During the time that he had the management of the property, he inspired confidence between landlord and tenant, without which no property can be worked with advantage to the owner or justice to the tenant (Hear, hear). Gentlemen, I need scarcely say that Mr. Hawkins handed back that estate to Mr. Trethewy's management; and I know, from recent personal communication which I have had with that gentleman, that he has not only the most unbounded confidence in Mr. Trethewy as a steward, but he has likewise the highest personal regard for him, and respect for his character (cheers). Gentlemen, Mr. Trethewy has been a distinguished member of all the leading agricultural societies of this kingdom. In the Royal of England, in the Bath and West of England, and in the Royal Cornwall he has been a prominent member and frequent judge; and I know that it has not only been for the sake of the estate under his charge, or for his own personal advantage, but for the sake of the county at large, that he has been a member of these societies, and encouraged by Mr. Hawkins to visit every place from which he thought a single improvement could be obtained (cheers). As a land valuer and referee and umpire Mr. Trethewy has always been greatly sought after; questions of the greatest difficulty and disputes of the nicest description have been constantly submitted to him, and he has lent his aid for the purpose of restoring good-will between neighbours, when the breach appeared beyond all human healing (cheers). From my earliest professional career I have felt the highest respect for him, and I can give you no better illustration of the opinion I entertained for his integrity and honesty, than by referring to a small transaction in which I was personally concerned. On one occasion I was about to become a purchaser of a small property, and I was told that a valuer had been appointed on the other side. I asked who had been selected, and when told that it was Mr. Trethewy, I said I do not want any other; I do not know what his valuation is, but I have every confidence in him, and I am ready to enter into the contract (cheers). But, gentlemen, I will now draw you to a wider range. You know that Mr. Trethewy, by his advice, forethought, and intelligence, has done everything which a man could do to stimulate and encourage the farmers and the agriculturists of this county in the course of remunerative improvement, and this he has done not only by the introduction and encouragement of new manures and new crops, but by introducing improved implements and improved breeds of cattle (cheers). If Mr. Trethewy's talents had been confined to one thing—the good management of Mr. Hawkins' property—we

should not have been here to-day; but it is the accumulation of all his merits which have brought us together on this occasion. Although the outline which I have given is very brief and imperfect, yet I believe you will agree with me that Mr. Trethewy has traced to its sources the spring of agriculture, and though he will pass away from us, yet he will leave his footprints upon the agriculture of Cornwall for all time—(cheers)—and not only in Cornwall, for he has planted two of his sons in two other counties famous for their agriculture—namely, Bedford and Norfolk, where he has made them Goliaths in agriculture (loud applause). I am happy to say, however, that he has one little David in his son William, whom we shall keep among us (cheers and laughter). Gentlemen, is not such a man entitled to some acknowledgment from his native county? You have answered in the affirmative, and never was there a more spontaneous offering (cheers), originated by my friend Mr. John Gatley, seconded by Mr. Bullmore, of Trescoben, adopted by acclamation by a numerous meeting, and ratified by the entire voice of the county (loud cheers). It has been said that farmers are but small subscribers—that they measure their subscriptions by their profits, and these, we know, are very small; but I can tell you that on this occasion—and I have had no other experience of the way in which farmers contribute—they have flown in freely from the very first, and, if needed, would have flowed uninterrupted to the present time (applause). Gentlemen, you must, I am sure, have often seen on market days the smiling and gratified face of my friend Mr. Gatley, who has taken a deep interest in this matter, standing at the door of the Red Lion Hotel, with the farmers gathered around him and emptying their pockets towards the testimonial, until my friend was compelled to cry out, "Hold, enough: I cannot take any more money" (loud cheers and laughter). Gentlemen, then came the examination of the list, and there was found to be upwards of 500 subscribers, and among the names are some of the most honoured in the county. There are Lord Falmouth, Sir Charles Lemon, Mr. Robartes, Mr. St. Aubyn, Mr. Davey, Mr. Carew, Mr. Gregor, the two Mr. Hawkins, Mr. Ennis Vivian, Mr. Humphry Willyams, Mr. William Williams, Mr. John Michael Williams, Mr. Henry Williams, Mr. George Williams, Mr. Bolitho, Mr. William Coulson, Mr. Hendy, Mr. Gully Bennet, and a long list of others, from the peer down almost to the labourer in his cottage; and among them my friend has found the widow's mite—a widow who, no doubt, remembered that Mr. Trethewy had, by his advice and kindness, rescued a husband, son, or brother from some difficulty during a time of difficulty or distress; but John Gatley said, "No, no; we will not take the widow's mite, but will accept her good will, which will be a blessing upon our work" (cheers). Well, the money was subscribed, but what was to be done with it, amounting as it did to upwards of £400? There was but one feeling, that there should be some lasting memorial of this man, that his lineaments should be handed down to posterity, as an incentive to those who might come after him to pursue a similar useful and upright course (cheers). Gentlemen, we determined to have one of the first artists in England to portray those lineaments, and in this selection I must say that we were greatly assisted by Mr. Hawkins, with whom we communicated on the subject. Mr. Knight, Royal Academician, was chosen, and I must say that he has been eminently successful, because he has not only portrayed the features of Mr. Trethewy, but he has also given us the character of the man (loud cheers). Still, there was a large sum remaining, and what was to be done with that? It was determined, and again we were unanimous, that a service of plate should be presented to Mr. Trethewy with the portrait, in such a form as would enable him, if he pleased—but without in any degree intimating or dictating to the recipient what he was to do with it—to place something hereafter in the hands of every member of his family, to which they could point with just pride to those around them, and say, "See what the county of Cornwall thought of our father" (cheers). Gentlemen, I have said that Mr. Knight has been most successful—judge for yourselves. [At this moment the muslin curtains were drawn aside, and the portrait and the handsome and massive service of plate were exposed to view. The enthusiasm became very great, the entire company rising and cheering most enthusiastically in honour of Mr. Trethewy.] Gentlemen, these enthusiastic cheers tell me that I was right; and now there remains but one pleasing duty for me to perform.

Feebly and imperfectly I know the rest of that duty has been done; but now, sir (turning to Mr. Trethewy), let me in the name of all the subscribers, many of whom are present, and still many more are unavoidably absent—let me present to you this testimonial in the short, simple, but heart-felt words of the inscription: as a mark of our high esteem, and in grateful acknowledgment of the substantial services which you have rendered to agriculture, particularly in this your native county of Cornwall" (loud cheers). One word more, and I have done. It is to add a fervent and heartfelt wish, on my own behalf, as well as on behalf of the company, that long-continued health and life may be preserved to you, for the sake of your family, your friends, and the county you have loved and served so well (loud and prolonged cheering).

Mr. TRETHEWY, on rising, was warmly greeted, and he spoke throughout under visible emotion. He said: Mr. Chairman and gentlemen, I think I need scarcely say that I live with feelings of considerable emotion to thank you most sincerely for what you have been pleased to say of me in this room. I also thank you, gentlemen, from my heart, for the very handsome and costly testimonial which you have presented to me, accompanied as it is by so many expressions of kindness and regard towards me. It is far more than I could ever have expected, and far more than I anticipated when the subject was first proposed. I feel that I am far from deserving of such a valuable testimonial or of the many complimentary things that have been said of me, although I do not scruple to say that I may have been of some service to agricul-

ture (cheers). What I have done, however, though in some measure with the view of benefiting myself, I can say also was in the hope of benefiting others (cheers). Again I must repeat that what has been done has far exceeded my expectations; for I never once thought that the matter would have attained such importance, neither did I expect ever to see such a number of influential gentlemen met together to do me honour as are now assembled. I feel grateful to the clergymen who are present for having spoken of me in such kind terms, and heartily thank them for so doing. The chairman has also referred in too complimentary terms to what I have been the means of doing for agriculture, and for the estate with which I am connected as agent; for I do not know that I have done anything more than my duty, but I trust I have not fallen short in that (cheers). In all disputed cases of valuation where I have been called in, I have always endeavoured to satisfy myself, acting on my own unbiassed judgment; and it is gratifying to me now to know that in so acting I have given satisfaction to others (applause). Gentlemen, I cannot follow the chairman through all that he has said, but I know that you will take the will for the deed (cheers). I most heartily thank you again for your great kindness, and particularly for the kind wishes and the kind feeling that have been expressed and shown towards me. (Mr. Trethewy then resumed his seat amid loud cheers.)

Other toasts followed, including "Mrs. Trethewy and her sons," which was responded to in turn by Messrs. Henry, William, and Alfred Trethewy.—*Abridged from the West Briton.*

CLAYING FEN LAND.

RAISING SUBSOIL CLAY BY MACHINERY.

Large areas of our fen soils of irregular depths lie on a substratum of clay, and from time immemorial a portion of this clay has been brought up and spread upon the surface as a highly fertilizing top-dressing. According to the old proverb, "*Lay clay on sand and you buy land*"—a proverb that applies with equal truthfulness to peaty soils and others of a kindred character. Claying has been pursued with a varied success, in the Bedford Level for example, almost ever since it was reclaimed from the ocean. The work is done by laying off the land to be clayed into ridges, and then by digging a trench in the furrow between each two for the purpose of bringing up a sufficiency of clay for the half-ridge right and left. Thus, a deep cut is first made, the black earth thrown to one side, and a sufficiency of clay then brought up for being afterwards spread upon the two half-ridges adjoining. The black earth of the next and every succeeding cut is thrown into the bottom of the last cut, when the bottom clay is again brought up, or the black earth removed from the top of each cut may be shovelled back into the bottom after the clay has been dug up. Details of each kind are determined in practice by the peculiar *data* of each example, such as the depth of the black earth incumbent on the clay, and the quantity of the latter that is to be brought to the surface. The breadth of the ridges and of the trench between them will, therefore, depend upon the depth of the black earth and quantity or depth of clay to be applied to an acre.

Performed by manual labour the work has ever been considered a galling and dirty one to the workmen employed, owing to the obnoxious gases that are liberated during the removal of the earth, almost suffocating at times when the trenches are narrow and deep. Those engaged at such work are consequently unhealthy and generally short-lived, being often a burden upon the parish during a great period of their lives. It follows that the undertaking is more expensive to the farmer than the high wages required to be paid to the workman, to induce them to enter the trenches and undergo the sacrifice of health involved, indicate, as the extra poor-rates and private charities have all to be added to the long account of outgoings. In short, the work is detested by the employed, and but for the extra benefits gained would not be persevered in by the employer, or sanctioned by a thinking public bound by every tie of duty and interest to advance the cause of sanitary progress.

Some time ago a highly laudable effort was made to do the work of raising the subsoil clay by machinery. In other words, a portable steam engine with digging apparatus was invented and manufactured for removing the black earth, bringing up the clay in any quantity desired, throwing it to either side ready for spreading, and for filling in the black earth removed into the trenches, thus leaving the land ready for tillage. This idea is a noble one, in keeping with the steam-going times in which we live, and although the machine was not altogether such a complete success as the demands of practice required, we are given to understand that with some further improvements discovered and matured during the experiments made, it nevertheless contained all the elements of a useful working desideratum. It is thought a great pity that it should be allowed to lie any longer rusting at Little Port, in the Isle of Ely, where it may be seen by any engineer, landowner, or farmer interested in such improvements. Although we have several times of late passed along that line by railway, and were also more recently on foot in the neighbourhood—(Ely, Little Downham, and March)—and were hardly pressed to go back to examine the machine, &c., our obligations prevented us from doing so. But we promised to discuss the subject *de novo*, in a more comprehensive sense than the Little Port claying machine embraces. This promise we now fulfil. We regret to say, however, that we have not since then found an opportunity of going back to Little Port for the purpose of examining the machine that is lying there, consequently we can neither do it or its inventor justice (whose name is so illegibly entered in our note book that we cannot decipher it to our readers, unless it be *Mr. Savage?*) To avoid any mistake on this head, we have taken the liberty of technically terming it, for the sake of brevity, as above, *The Little Port Machine*.

In canvassing the subject from an elementary point of view, which is all that can legitimately be proposed, we have first to observe, that in some examples the clay may be brought from the adjoining elevated grounds more cheaply by a temporary railway system than by steam machinery from the bottom. The former proposition will be discussed in our second part on this subject, and the latter in this.

Machinery for raising clay may be constructed on three principles:—First, a portable or traction engine working on a temporary line of railway; second, a portable machine travelling over the ground, carrying its own endless railway; and third, a common traction engine at the headland actuating the

claying machine on what has been termed the "rigger principle," the claying machine either carrying its own railway or else working upon a temporary one as in the first and second examples.

The reader will perceive that in the above three plans the common elementary principle of a railway is involved in each. When Archimedes proposed turning the "big globe itself," which we inhabit, out of its orbit by means of a lever or system of levers, the first elementary principle required in the solution of his problem was a fulcrum for his machine; and this is exactly what the fen farmer requires when he proposes to enter his fields with a claying machine; for fen land, even in the dry months of summer, does not furnish sufficient fulerage for such machinery. We are not certain, but we rather suspect that one of the cardinal shortcomings of the Little Port machine is the want of a fulcrum of sufficient stability to work upon. We know that the contrary opinion prevails, and that to a large extent it is acted upon at the present time in the construction of traction engines, viz., that the diameter and breadth of the wheel may be increased so as to find a suitable fulcrum on any soil; and further, that this was proposed for the Little Port machine itself. But the opinion is fallacious both in principle and practice; and although it is always prudent to allow implement makers and practical mechanicians generally to ride their own hobby horses as long as they can, this same popular opinion is already beginning to lose favour in the estimation of the more intelligent and better-educated portion of the agricultural public, among whom we may instance several of the large fen farmers we met with in the neighbourhood of Little Port; for, granting the soundness or rather practicability of the popular opinion in the continuous locomotion of ordinary traction engines, they see that the intermittent locomotion involved in the example in question would deprive the engine of its momentum in the first place, while, in the second place, the machine in working would sink the wheels when stationary into the soft bottom so as to render farther advance impracticable.

1. *A Temporary Railway Fulcrum.*—On each side of the trench to be opened by the excavating apparatus a line of short sleepers may be laid, and, on these, broad rails for the broad wheels of the engine to travel upon. The length of the rails may be equal to the length of the earth to be excavated at a time, so that when one cut is finished, the engine would move another length forward, when the two rails, and two rows of sleepers behind, would be removed to the front by manual labour. At the headlands, the machine may be turned into a fresh trench on one of several ways, as broad circular rails, a temporary turn-table at each headland, a temporary turn-table jack carried by the engine, &c. This is, perhaps, not the more promising plan, but it has its advantages as well as its disadvantages.

2. *Endless Railway Fulcrum.*—Two plans of this kind have been proposed, patented, and successfully reduced to practice; the one by Heathcoat, patent No. 6,267, 1832; and the other by Boydell, patent No. 431, 1834. The former consists of the sleepers and rails being so constructed as to form an endless flexible railway passing under and over the wheels of the locomotive, so that in travelling, or actuating any external machinery at either side, it works in the interior of this endless railroad, which "affords a broad extended surface for the purpose of sustaining a carriage of great weight upon soft, swampy, boggy, or unstable land." It was successfully used in reclaiming mossy land. The latter consists of a series of sleepers or short rails placed longitudinally upon each wheel, and is too well known to require further description.

For a claying machine, Heathcoat's endless railway would have to be constructed on a different plan from that which was used for the steam ploughing of Chert moss, and other peaty grounds. Instead of the sleepers extending the whole length of the locomotive, for example, there would require to be an open space longitudinally up the middle the breadth of the trench, to permit of the working of the excavating apparatus. If we therefore assume that the engine has six wheels, two in front, the one following the other, and two on each side behind, the one following the other, then each wheel would have double felloes, and each two wheels would form a set, carrying their own endless railway, so that in the system the engine would be borne on three endless railways, one in front, and two behind, one on each side of the trench. The endless railways may be of any breadth which the softest condition of the

soil required; probably three feet would be sufficient, and between each two wheels there may be friction rollers, for keeping the endless rails down to the ground; but into minute details of this kind our space will not permit us to go further.

In Boydell's wheels, the only alteration required from those now in use would be an increase of bearing surface. In other words, the wheels would require to be increased in diameter, in order to carry longer and broader rails or shoes. An increase of breadth, it is true, may be effected without an increase of the wheel, and this, in some cases, may afford a sufficient extent of bearing surface.

3. *A Common Portable Engine, situated on the Headland, working an Excavating Machine by means of Tackle on the Rigger principle.*—An excavating machine could easily be worked up and down the land by means of an anchored rope and rigger tackle, in a frame or carriage borne on Boydell's wheels, and the whole could be constructed at no great additional expense to those who are already in possession of a traction engine and a Fiske steam plough. Fen lands are generally of great length; but by running the engine along both headlands, and also across the middle of the field, it would be reduced to one-fourth, or to four working lengths. In short, the largest field can easily be reduced to any given length of rigger-working ropes which the circumstances of the case may require. Into the elementary principles of the peculiar mechanism required, the difference between their details and those of Fiske's steam plough, with which our readers are doubtless all familiar, are so small as to render it unnecessary to say anything further on this head; what we have already said, relative to the wheels of the steam engine when travelling over the ground, being applicable to those of the carriage of the excavating machine when actuated by a stationary engine and rigger tackle.

Of the elementary principles on which the excavating apparatus may be constructed, we might quote the long list of patents which have been specified for work of a similar kind, were we certain that our reader's patience would bear to be stretched to such a length. Spades and ploughs, and Jacob's ladders, endless bands and dredging apparatus, mechanical Talpas and Archimedian screws, gunpowder and electricity, are all included in the patented discoveries of the past; and to this long nondescript category an equal number may safely be added of unpatented inventions. Something will depend upon the nature of the soil, subsoil, and how the work is to be done, such as the length of a trench that will remain open at a time without the sides falling in, to mar the successful working of the machinery. No doubt the sides can be planked, to prevent their falling in, but such will be experienced serious obstructions to the successful working of the excavating and elevating machinery. The safer and more advisable course is short cuts at a time, each cut being of no greater length than will stand open to whatever depth it has to be sunk; and for this, no general rule can be given that would be applicable to all cases, one subsoil requiring one length, and another subsoil a different length. Every district must, therefore, be left to determine its own length of open trench from which the black earth above the clay has to be removed at a time, in order to permit of the latter being brought to the surface. But the principle upon which the twofold work—the removal of the black earth, and the removal of the clay—is to be performed is manifestly determined, viz., a short cut, and the filling of the open trench close up behind with black earth removed sufficiently close as to keep out the sides.

To this liability of the sides of the trenches to fall in there may be many exceptions; but in the construction of machinery, the safe and sound course is always to make provision for the worst; and this peculiarity, in a great measure, determines the principles of mechanism upon which the excavating apparatus should be constructed. More practically speaking, the black earth in the opening of the first cut has to be thrown upon the surface; but in the second and successive cuts, if of considerable depth, it may be thrown into the open cut behind, so that the machine must be capable of doing both works, either the one or the other, as the depth may require. The clay, on the other hand, has always to be raised to the surface, and thrown the one half to the right, and the other half to the left side. The principles of mechanism, therefore, are longitudinal excavating and elevating apparatus, and transverse delivering apparatus. This latter apparatus may easily be made to deliver first the black earth, the half to the right side, and the

other half to the left; and, second, the clay over the black earth, the half to the one side, and the other half to the other side. In construction it may be a plain "traveller band," with a reverse rotary and longitudinal reciprocating action. The black earth and clay may be loosened and elevated in several ways. The common dredging machine, with very little modification, may be quoted as an example. As the clay is liable to adhere to all implements of this class, as it does to a spade in digging, water will require to be used, to keep the cutting edges clean. But into details of this kind we cannot go further at present.

RAILWAY SYSTEM.

In examples where proprietors have an abundant supply of clay upon their own lands adjoining their fens, the practical question naturally arises for solution, Can a temporary railway of a portable character, such as Crosskill's, be laid down for the purpose of carrying the clay from the adjoining elevated grounds? And can fen lands be more cheaply and economically clayed on this plan than by raising subsoil clay by steam power, as in the preceding example? So long as the fens are farmed on what may not inaptly be termed the stagnant bottom-water system, the digging of trenches and the filling of them up again may do little harm. But if it be conceded, for the sake of argument, as we presume it must, that the old-school philosophy of expediency, involving stagnant water in the subsoil, is fast getting out of date, and, consequently, that at no great distance of time all fen soils will be thoroughly underdrained and otherwise farmed on sounder principles, then some very grave objections arise to the bringing up of subsoil clay, according to the present practice; for the trenches must, at the same time, be efficiently underdrained, so as to prevent stagnant bottom-water—an alternative which introduces not a few practical difficulties for consideration, owing to the unequal depth of the black earth incumbent on the clay, and the uniform depth of clay that requires to be raised to the surface. Now, if the clay can be brought more cheaply from the adjoining uplands, all such objections would, of course, be obviated; while fen lands, after claying, would be left in a more favourable position to undergo thorough bottom-drainage, aeration, and artificial watering (in times of drought) by steam power, or gravitation, where the hydrants are below the level of the river or fountains from which the water is drawn. And the application of water, as above, suggests the application of the clay on the principle of warping; but to this we must return in a separate article.

It will thus be seen that the question of cheapness and economy must not be hastily viewed in a penny-wise and pound-foolish light, either by landowner or tenant: in other words, the original expense of claying an acre of fen land must not be considered apart from the expense of under-drainage, harvest returns, and profits arising from the improved and more productive condition of the land generally. The expense under the present practice of raising subsoil clay by manual labour will exceed, in the outset, that of bringing it by railway from a considerable distance. If, however, machinery can be invented for raising it, the first outlay may be less; but if the deep bottom-trenches, from being uneven at the bottom, increase the expense of drainage, the difference may, in the end, be in favour of the railway system of claying. Then follow a series of practical questions as to which is the best quality of clay for applying to the fen soil under consideration, and which the system that will ensure the best work and produce the greatest returns in harvests, &c.

Claying fen land is a work which evidently belongs to the landowners' department of agriculture, more especially when the clay has to be brought from the adjoining uplands by railway; and, from the above premises, it is equally manifest that those who have a command of clay within themselves, so to speak, need not postpone the important work of improvement until the invention of machinery for subsoil claying is made. The soundness of this conclusion is susceptible of a ready-made practical demonstration; for the profits arising from the present rude practice, and the universal demand for the application of clay, place the practical question at issue beyond a doubt. In point of fact, we never pass through any of our extensive fen districts without sitting in judgment, as it were, upon this question, and pronouncing a verdict of guilty

against both landowners and tenants; for the work is a national one, imperatively demanding performance; and neither of them can plead a valid excuse for the bleak, inhospitable appearance which the contrary condition of things presents to the eye of the intelligent observer, let him be engineer or agriculturist. Moreover, the old proverbial query, "Will it pay?" is, in this peculiar case, excluded; for, if the present practice pays, the proposed one will pay better.

This brings us to the landlords' and tenants' pockets, or the expense to the landowner of claying an acre, and the interest which the tenant would have to pay for the capital thus invested.

Like most other great undertakings, small jobs would be more expensive than large ones, and work well done cheaper than that which has been slimy or imperfectly performed. If, for example, a landowner has a large area of fen, it would cost less to do the whole at one contract than to extend the work over several seasons, doing it bit by bit, or so many fields or acres yearly. Again, the application of a depth of six inches of clay would not cost six times the outlay of one inch: in other words, more practically speaking, when once the railway is laid down, give the land such a coating of clay as will guarantee ample profits to the tenant, after paying redeeming interest to the landlord on his investment—such a coating as will pay both landlord and tenant well for their skill and capital.

Actual outlays and returns in harvest can hardly be approximated sufficiently near without an actual example, to be of any practical use. But certain principles of action may be definitely laid down with sufficient clearness to enable parties to form an approximate estimate for themselves. Thus, the whole work should be done on the taskwork plan; so much for the application of a cubic yard of clay to the land. The excavated clay, for example, can always be measured with accuracy, so that it is easy to calculate how much land a cubic yard should be spread over, whatever might be the depth determined upon to be given. Thus, at one inch of clay, a cubic yard would cover 36 square yards, being at the rate of rather more than 134 cubic yards to the acre; at a claying of 2 inches deep, 18 square yards per cubic yard, and about 269 cubic yards to the acre; at 3 inches deep, 12 square yards, and 403 cubic yards to the acre; at 4 inches deep, 9 square yards, and 538 cubic yards to the acre; at 5 inches deep, rather over 7 square yards, and about 672 cubic yards to the acre; and at 6 inches depth, 6 square yards, and 806 cubic yards to the acre.

Some sandy clays are easily handled, both in the filling and spreading, and such are probably the best adapted for claying soils. In earthing on such open peaty lands with horses, we have had the work done at as low a rate as a penny per load for filling, each load containing rather more than a cubic yard, a like sum being paid for the spreading, counting nothing for horse work, but including the carman's wages in the filling; all the hands making 2s. per day. The thicker the top-dressing the less will be the labour and expense of spreading, and for a similar reason, when the carts are backed to a deep bank of clay, so that a great portion is above the level of the body of the cart, it will reduce the amount of labour and expense in the filling. For tenacious clays that adhered to the spade we have paid double the above price, or 2d. per load; and for stony clays 3d.

We have no experience in claying land by railways as proposed; but from the waggons being rather lower than horse carts, and from the regularity with which the loads would be emptied upon the land, the expenses should not exceed the above by horse work.

With regard to the expense of horse work in the conveyance per railway, as there would generally be a slight inclination downwards from the clay bank, it would cost very little more than the bringing back of the empty waggons or trucks. It follows that in details of this kind each case must be its own rule, so to speak; and the same may be said of the expense of the railway plant, trucks, &c.

As to the loss of land from the removal of clay, that would only be temporary or during the execution of the work, as the staple soil or top-spit could easily be removed and thrown back behind, should the sterility of the subsoil require it; but in many cases the loosening of the subsoil and its exposure to the weather would render it fit for cropping in a single season.

For extensive works two lines of rails would be required,

one the down-line for the loaded waggons, and the other the up-line for the empty ones; and the up-line this time would be the down-line the next time. From the down-line the waggons would be emptied on each side, right and left alternately, so that between the two lines there would be two rows of heaps or loads. In claying a large district of fen, the down and up lines of rail would pass through fences, and over cuts, open ditches, drains, and roads, and everything, in short, that did not interfere with the levels and traction of the waggons. At short distances junction lines would be required for shifting the waggons, when emptied, on to the up-line. The lines at the farther extremity would terminate abruptly; but the entrance to the grounds to be clayed would be by short curve lines, so as to avoid the expense and hindrance of right angles and turntables. These, the engineer or overseer in charge of the works would have no difficulty in laying down, to meet the peculiar demands of the case, whatever they may be, so as neither to increase undue expenses, nor retard the work of claying.

As soon as the two lines, the down and up, are laid, the work of claying would commence at the farthest extremity of the former or down-line. If we suppose that there are twenty waggons in a train, then the first down train would be emptied to the right, or left, as the case may be, and then drawn on to the up-line, when the second train of twenty waggons on its arrival would be emptied to the opposite side of the down-line, and returned by the up-line. This done, a gang of workmen would commence shifting the down line over to the other side of the first up-line for the second up-line, and as fast as the ground was clayed on either side of the first down-line. The work of shifting could be done at so much per yard or per hundred yards. As the third and fourth trains come down, they would be emptied right and left, as the first and second were; and so on for all the other trains until the first down-line was finished, when the first up-line would then become the second down-line, and so on. Thus the work would proceed with a great deal more regularly and expedition than in the formation of railway embankments, when the waggons have to be emptied one by one over the end of the line; for in claying land the whole of the waggons in the train could be emptied at once, or, practically speaking, during the time the team of horses was being unyoked from the one end of the train and yoked to the other, supposing that tractive force is required both ways down and up, the draught of the loaded train upon the down-line being about the same as that of the empty one returning on the up line, both gradients being about equal.

Contracts for claying fen lands would be free from the vast majority of those risks that attend the formation of railways

and other public works of a similar character; so that they could be undertaken at a minimum charge; and this applies equally to both the employer and employed. Fortune-making jobs on the one hand and ruinous speculation on the other would be the exception, and honestly-won wages and interest on capital to cover actual tear and wear on railway plants and rolling stock the rule. The work is doubtless a large one, involving an immense outlay of capital on the part of landowners; and brief as our remarks have been, they and all parties interested will readily perceive the soundness of the conclusion already arrived at, that when once the railway-lines are laid, and the work of claying begun, a thorough dressing of sufficient depth to consolidate the light puffy fen soil during the season of vegetation, and otherwise to increase its fertility in the highest degree, would be the cheapest plan; and *vice versa*, that half-done work although the cheapest in the outset would be the dearest in the end. But large as the investment of capital is—and we do not wish to conceal a single farthing of its magnitude from our readers—it is nevertheless, according to the old proverb, tantamount to buying land; and we do not hesitate to affirm that if landowners and tenants would lay their heads and shoulders to the work (like a good-going team), the latter could well afford to allow the former redeeming interest on their capital within the currency of not a very long lease, and have a larger balance remaining at their bankers at the year's end than at the present. The public gain would also be immense, for an efficient dressing of sandy clay would not only convert the staple of our fen districts into a rich loam, but it would also immediately lead to their thorough under-drainage, thus changing the somewhat bleak and unfavourable appearance which they everywhere exhibit to the eye of the traveller at present, giving to them a healthy air and inviting landscape. And from a public or national point of view this is not all that must be said, for besides our fen districts there are immense areas of peat bog and drifting sand that could be profitably clayed, and converted into crop-bearing land, through the instrumentality of railways. To the reclaiming of the millions of acres of Irish bog we may return in a separate article. But the "live bogs" of the Sister Country do not form the only example of the kind to which claying and efficient under-drainage apply; for besides our fens, there are in England thousands of acres that loudly call, at the present time, for the reduction of our proposition to practice. Were a million of the capital now prodigally squandered in poor's-rates, in supporting able-bodied but idle hands annually, for example, spent in improvements of the kind in question, the difference to the country is something worth talking about by many more than the out-and-out advocates of economy and retrenchment.

CULTURE OF THE PARSNIP AS A FODDER PLANT.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Few persons in our country have as yet tried the experiment of planting many of their fields with parsnips, for the purpose of feeding cattle. Those who have tried it, invariably failed on account of their obstinacy in cultivating the parsnip by the same means used for the carrot and beetroot.

But supposing, on the contrary, rejecting the culture of roots, we treat it as a fodder plant, we shall obtain the most satisfactory results, and it will become a valuable resource in giving green fodder at a time of the year when such food is excessively rare.

One great advantage in the parsnip is, it never suffers from the attacks of frost, and it may be left in the field a whole winter without sustaining the slightest injury. It can be cultivated in any situation where beetroot and carrots have given satisfactory products; but the result will be much more sure and complete if care be taken to choose a fresh earth, substantial and deep.

It may be sown from the commencement of April to the 15th of May, in land prepared as for the culture of carrots; the seed should be sown in ridges nearly 12 inches apart (that distance is sufficient to obtain good results in green food). Two dressings should be given to the crop during the dry season, for the purpose of destroying the weeds, and if the plants are carefully thinned till they are about 3 or 4 inches apart,

by October the foliage will have attained the height of 12 or 16 inches. It may then be cut with a scythe to within 2 or 2½ inches of the ground, supplying the cattle with a dainty of which they are very fond.

Thus the fields will remain without culture until the end of February or the beginning of March, according to the season. By that time the heads will have again sprouted to the height of 10 or 12 inches, and may be cut as before, from the 15th of April following to the 15th of May. The vegetation is so active, that the parsnip rapidly reaches the height of 40 to 60 inches.

It therefore yields an abundant crop; in fact it is no exaggeration to say that one acre cultivated with parsnips gives at the first cut as much green fodder as 4 acres of lucerne.

At the last crop, the root should be drawn with the plant; and before giving parsnips in pasture to cattle, the roots should be cut up, and mixed with the leaves in bits.

Those of my milch cows which have been fed in this manner gave me from one to two pints of milk more than their ordinary produce. I ought to say, that unless green fodder is very much needed in October, it is always better to abstain from cutting it at that season; a much better crop will be obtained in February or March, which will more than compensate for the loss of the first cut.

BELLOT-DEFOUGERE.

THE WARWICKSHIRE AGRICULTURAL SOCIETY.

MEETING AT STRATFORD-ON-AVON.

With a liberal prize list backed by good entries, with very excellent arrangements associated with a most attractive site for a show, the Stratford meeting promised to be the most successful the Warwickshire Society had ever yet known. There was, indeed, but one drawback, and that not the weather, which was as glorious as it has been for the last month or more. The first glance over the ground, however, went to convince one how terribly the panic was telling, as standing after standing in the more important classes of cattle was seen to be empty. The exhibitors of horses, sheep, and pigs had pretty generally sent in their stock; but the Messrs. Garne of Broadmoor and Churchill Heath, Mr. Lynn of Stroxtton, Mr. Duckham, Mr. Holbeck, and others from anything like a distance, prudently declined to run the risk of a railway journey, and thus limited the competition to the breeders more immediately in the neighbourhood. In the class, for instance, of Shorthorn cows, numbering some very good names, but one of the eight entries put in an appearance, and Mr. Worsey was accordingly recorded as the winner. In the pairs of three-year-old heifers, Mr. Hyde of Newbold became first under similar circumstances; and in the two-year-old class, Mr. Lythall took the first prize, and Sir G. R. Philips the second, with nothing further for the judges to select from. In the all-aged bulls, again, Mentor, a deep plain animal, had but another to beat, whilst amongst the two-year-olds the many withdrawals would seem to have cleared the way for Mr. Walker's Battersea First Fruits, the third prize of his class at Plymouth, where he showed a deal of promise which he is still developing; though the judges at Stratford declared that they saw his superior in Mr. Corbett's entry, a young bull, bred by Mr. Worsey of Clopton. The first yearling from Sevenhampton has no particular excellence so far, but the two prize bull-calves were both clever enough, and with this local offer the Shorthorn section, terribly shorn of its proper strength, came to a close, there being no question but that many of the best animals in the entry were kept at home. In the succeeding division of Herefords, Mr. Duckham scratched The Commodore, and thus left Mr. Read of Elkstone as the chief competitor of Mr. Baldwin, who so handy home brought something for nearly every class, and was almost as generally successful. Still, the Luddington herd is by no means so formidable with its young stock, and there were some heifers on view here that had far better been away, the more especially when put into comparison with the grand cows that their owner has been collecting with so much spirit. But the sensation of the day was over the bulls, with Battersea once more as the best bull of any pure breed; a class in which he beat a very good bull "in places" of Mr. Corbett's, and then came out to fight the Plymouth battle over again with Mr. Read's Peremptory, who had also won in his class, for the extra ten pounds as the best bull on the ground. And here the Judges and the public fairly divided, for the Elkstone bull has, if anything, improved since his visit to the far West, showing now full of muscle and good firm flesh; whereas Battersea is fading fast, with his touch gone, and a very noticeable lack of vigour about this once-famous bull. Still, the Judges were not slow in pronouncing him the better of the two, and so for the second year in succession Mr. Baldwin has held the chief

honours at home. Mr. Umbers, of Wappenbury, had the Devons all to himself, winning in the cow class with twins of his own breeding; and that champion of the old school, Mr. Chapman, once more brought Sparkenhoe to the fore, in illustration of what a prize animal really should be; and certainly, "for a Longhorn," the Upton bull is by no means a bad one.

The sheep show was said to be above the average of all the Warwickshire Society has been hitherto able to do in this way, and with the exception of the Southdown there was scarcely a breed but which was fairly represented. Mr. Lythall's Leicesters are of a fine useful stamp, though not up to the excellence of Mr. Creswell's two-shear, here first out since his season in Ireland, where he was let to Mr. Thunder. The ewes were not so good; but Mr. Bennett's theaves are all of Sir Tatton's blood, on either side of their heads, and this of itself is something of a character. Amongst the other longwools or Cotswolds Mr. Read distinguished himself with a shearling that took the extra premium as the best of all the Cotswold rams, and in so doing beat some very well-known sheep of Mr. Gillett's, the best shearling of the Oxford and West of England meetings, and the best of the all-aged rams at Plymouth. With the ewes and ewe lambs Mr. Gillett had more his own way, and his two pens of ewes were particularly good. In the Oxford Downs, again, some previous readings were corrected, and Mr. Bryan's prize Plymouth shearling was now without a place against another sheep from the same flock, put second, and one of Mr. Wallis' that never previously reached above a commendation, as the best of the class; while in the older sheep, the positions taken by the two Shiford sheep at Plymouth were reversed, the second being now first and the first second. The show of Shropshires, considering the locality, might have been stronger, and, with the exception of Mr. Brabburn's best two-shear, there was nothing very extraordinary in the small entry, where the flocks of Mr. Holland and Mr. Randell, as a consequence, had more attention than they have been able to command of late. Some of their ewes were really good; and Mr. Sheldon's shearling, a smartish ram, was commended in that large but incongruous class at Plymouth. There were some other local premiums for fat wethers and cross-bred sheep that brought one on to the pigs, where there were nearly as many premiums as competitors, the sample being not, on the whole, a very high one. For choice, Mr. Allender's two Berkshire sows, which were first and second in their class, had all the call, Topsy now strengthening her own personal recommendations by just a dozen young pigs as her last litter. Mr. Wells' large boar, long and handsome, and Mann's very neat small boar, were both worthy of their places; while Mr. Walker, of Bakeswell, won with a Tamworth sow, a breed that, like the Longhorn, we do not often see on the show-ground. Mr. Higgins of Binton, Sir G. R. Philips, Mr. Spencer, Mr. Smith of Henley-in-Arden, and Mr. James of Bridgtown, were also amongst the successful exhibitors of pigs; the last-named with a Berkshire boar bred by Mr. Hewer, and Mr. Smith with some of his own sort, that come out so well at the Christmas gatherings in Bingley Hall.

As it was, with so much of the best stock away, the

strength of the Stratford-on-Avon Show centred over the horses, of which, either for heavy or light work, there was a very creditable entry, with competition enough to give Messrs. Atkinson and Swale a long and rather tiring day of it. Their best cart stallion was a smart roan three-year-old the property of Mr. Wynn, of Grafton, and in a very large class of agricultural mares and foals, their pick, after commending a rare old grey of Mr. Butler's, was declared to be a brown of Mr. Holton's, an active true-made mare, with a great fine foal at her foot, that unfortunately got kicked by one of the other mares when they were brought out. In the two-year-olds Mr. T. E. Bennett's compact good-limbed filly, which won the Champion Cup at Loughborough the other day, was here only highly commended, the one premium going to a higher, but certainly not in any other respect better one, bred and exhibited by Mr. Hurlston. The pairs of working-horses, with many useful animals amongst them, were still but seldom well matched, but rather paired, like rabbits in a poulterer's shop, with one good one and one bad one; but Mr. Canning fairly won with a couple of the blacks indigenous to Warwickshire. The best hunter-stallion was Wantage, by Collingwood, a fair race-horse in his time, and whose stock is now coming out with some recommendation in the way of good looks and limbs. There was nothing of "any account" entered against the old chestnut; but the lot of hunters, ridden during the past season with the Warwickshire, the North Warwickshire, the Atherstone, the Pytchley, the Bicester, the Heythrop, the Cotswold, or the Worcester, was better made up, including as it did three or four horses of some character. Amongst these Mr. Cook, of Taddington, sent a good useful grey, a fine fencer, and the prize horse at Tewkesbury, whilst Mr. Milward had the winner of the Tally-Ho Steeple Chase at Warwick also in the entry, though the judges eventually agreed to differ over the merits of two of the others. One of these was a deep powerful bay, the property of Mr. Sargeant, of Long Itchington; the other a brown, by Ethelbert, bred and exhibited by Mr. Sheldon, of Brailles, and a really clever horse at most points. Full of quality and style, with fine shoulders, and a beautiful goer in all his paces, Athelstane is up to lots of weight, and as handy as need be at his fences. Still the authorities could not agree, and Mr. H. Corbet being sent for to decide between them, gave the award in favour of the brown, who won a prize at Banbury in the spring, and for whom it is said Mr. Sheldon refused an offer of something like 400 guineas during this meeting. The best hunter found a worthy companion in the best hack, a class in which Mr. J. E. Bennett, of Bosworth Grange, and the owner of Lady Florence, showed as sweet and almost as perfect an animal of her inches as a man would wish to see. Standing but fourteen two, "Octoroon," by Onlston, dam by Belzoni, has that great first "principle" of a hack—beautiful, easy action, with a deep, wiry, bloodlike frame, a good head, a light neck, and beautifully-placed shoulders. Up to a certain weight, the brown galloway would be worth almost anything; and Mr. Bennett has also, as we hear, refused a long price for his entry. The ponies were but a middling lot, and the cobs had not been out when we left the horse field, but Mr. Clark of Claverdon found the winner, while Mr. Sargeant righted in another hunter class, with a great useful four-year-old by Pontiff, a bay, with plenty of length and reach about him; and Mr. Knott claimed the best farmer's horse ridden with hounds in Warwickshire, with a bay of the right stamp, but in want of a cross more blood about him. Another premium for hunters ridden by farmers went to a brown, by Erix, in rather rough company; while Mr. Robins, of Bagington, showed the best two-year-old, a fine-grown colt by Oscar; and Mr. Hurlston,

of Ditchford, the prize brood mare, helped out as she was with a capital foal by Neville.

Mr. Wortley and Mr. Toone had another hard morning's work in distributing their £50 amongst the implement makers, and of which delicate investigation we subjoin the results; as with nothing more to pay there were companion shows of roots, fruits, flowers, and shepherd's dogs, with Mr. Godfrey and his Grenadiers in full tune, and a dinner on the ground, at which the ladies were especially invited to be present. If to all this we add the many attractions of the town itself in the way of Shakespeare's house, the church, and the calm beauties of the Avon, then the Stratford Show must be recorded as a success, despite the heavy cloud still impending, and the fear and trembling with which good animals are now brought together.

The best iron plough.—W. Glover and Sons, Warwick.

The best wooden plough.—W. Glover and Sons, Warwick (protest entered).

The best iron suffle.—G. Ball, Kilworth, Rugby.

The best wooden sheep-trough.—Ball and Sons, Rothwell.

The best iron sheep-trough.—W. Glover and Sons, Warwick.

The best set of gears.—T. Humphries, Stratford.

The following prizes were also given:—

Messrs. Ashwin and Co., Stratford-on-Avon.—Ransomes and Sims' jointed harrows, £5; Snowdon's patent paring plough, £1; pivot feeding trough, £1; Bentall's pulper, £1; Nicholson's haymaker, £1 10s.; Howard's haymaker, £1 10s.; Hornsby's pulper, £1.

Ashby and Jeffrey, Stamford.—Haymakers, £1; rotary harrow, £2; chaff-cutter, £1 10s.; hay-rake, £1.

Ball, Kilworth.—Waggon, £2.

Ball and Sons, Rothwell.—Cart, £1 10s.

Richmond and Chandler.—Chaff-cutter, £2.

J. Bradford.—Washing machine, £1.

Larkworthy and Co., Worcester.—Winnowing machine, £1.

T. Baker, Compton.—Thorney's water-cart, £1.

Barrows and Carmichael, Banbury.—Watts and Rickard's American grist mill, £5.

Dodge, Upper Thames-street, London.—Endless machine banding, £3.

W. Glover and Sons, Warwick.—Hunt and Pickering's cheese press, £1; Hunt and Pickering's paring plough, £1; Hunt and Pickering's chain harrows, £1.

R. Humphries, Pershore.—Combined thrashing machine, £5.

Parkes and Co., Birmingham.—Selection of tools, £2.

Woods and Cockedge, Stowmarket.—Horse gear, £3; crushing mill, £2; turnip cutter, £1.

The following gentlemen acted as judges:—Cattle: E. Franklin, Ascott, Wallingford; J. Jones, Springfield, Hereford. Sheep, Pigs, and Dogs: J. B. Twitchell, Wilby, Northampton; H. Osborn, Wreford Park, Tamworth. Horses: R. Swale, Saredon, Wolverhampton; W. T. Atkinson, Barrowby, Hall, Woodlesford, Leeds. Implements: E. Wortley, Ridlington, Uppingham; J. Toone, High Cross, Lutterworth. Ploughing and hedging: R. Swinnerton, Nuneaton.

HAY ASTHMA.—As there are very few bronchial diseases as little understood as that popularly called "hay fever," and as one or two letters on the subject have recently appeared in your columns, without giving any real means of cure, I am induced to avail myself of your pages to place the real state of the case before the sufferers from this very prevalent and distressing complaint. It is simply inflammation of the bronchial passages, caused by the contact of the floating pollen of hay, and a few wild plants that also yield the same irritating substance. It is with difficulty distinguished from ordinary coryza; and it cannot be cured by any known remedies; and a removal from the locality in which it is experienced, affords the only chance of relief. Temporary mitigation of the severer symptoms may be obtained by using powdered camphor in the way that snuff is usually taken.—GEORGE BARRETT.

KINGSCOTE AGRICULTURAL ASSOCIATION.

The annual ploughing match of this vigorous and flourishing society took place on Sept. 14th in a field at Latterwood, in the occupation of Messrs. Ford. The soil was a two years' ley in capital condition, and the day was splendidly fine. There were 50 entries—the largest number the society has ever yet had, and 48 teams started at nine o'clock. Half an acre was assigned to each team, four hours being allowed for the work. The quality of the ploughing, particularly that of the champion class, was of the best possible character, and gave the judges a very difficult task. There was a large gathering of farmers on the ground, and they all declared they had never seen superior ploughing. The following is a list of the prizes awarded:—

PLOWING MATCH.

A champion prize, open to any competitor who shall plough half an acre of ground in the best and most workmanlike manner with a pair of horses and no driver, £3, William Baylis, servant to Colonel Kingscote. To the best ploughman with a pair of horses and no driver, £2 10s., Henry Ball, servant to Mr. Henry Holborow, Willesley (Haynes's plough). To the second-best, £2 5s., C. Long, servant to Mr. R. Long, Nestley (Haynes's plough). To the third-best, £2, G. Collett, servant to Mr. R. S. Holford, M.P., Weftonbirt (Haynes's plough). To the fourth-best, £1 15s., W. Evans, servant to Mr. W. Drew, Bowldown (Howard's plough). To the fifth-best, £1 10s., Henry Beale, servant to Mr. Drew, Calcott (Ransome and Sims's plough). To the sixth-best, £1 5s., David Soutar, servant to Colonel Kingscote (Hornsbys's plough). To the seventh-best, £1, Daniel Cleveley, servant to Mr. Tanner, Leighterton (Ford's plough). To the eighth-best, 15s., W. Townsend, servant to Mr. W. Thomas, Star-and-Garter farm (Haynes's plough). To the best ploughman under 18 years of age, with a pair of horses and no driver, £2 10s., J. Kendall, servant to Mr. Worlock (Haynes's plough). To the second-best, £2, H. Ashman, servant to Mr. Blackwell (Hornsbys's plough). To the third best, £1 10s., H. Powis, servant to Mr. B. Drew (Ford's plough). To the fourth-best, 10s., J. Rudge, servant to Mr. W. Long (Haynes's plough). To the fifth-best, 10s., James Heaven, servant to Colonel Kingscote. To the sixth-best, 10s., George Cox, servant to Mr. Holborow, Bagpath. To the best ploughman with a team of oxen and a driver, £2, B. Evans, servant to Mr. O. Blackwell (Hornsbys's plough). To the second best, £1 10s., James Butler, servant to Mr. W. Drew, Bowldown (Hornsbys's plough).

TO SHEPHERDS, FOR THE ENCOURAGEMENT OF CARE AND ATTENTION TO THEIR FLOCKS.

To the shepherd who, from a flock of 50 or any greater number of ewes, shall rear the largest number of lambs, and save the greatest number of ewes in proportion to the number put to the ram; the lambs and ewes being alive on the first day of June, or *bond fide* sold fat previous to that time, £1, Charles Goodrich, shepherd of Mr. T. Price, of Kingscote; number of ewes saved 50, number of lambs reared 63. Ditto, for the second greatest number, 10s., Thomas Hooper, shepherd to Rev. A. G. Cornwall, Asheroft; 52 ewes, 61 lambs. Ditto, from a flock of 100 and upwards, £2, Henry Savory, shepherd to Mr. T. A. Stoughton; 102 ewes, 130 lambs. Ditto, for the second greatest number, £1, Richard Nicholls, shepherd to Mr. C. Norris; 104 ewes, 115 lambs. Ditto, from a flock of 200 and upwards, £3, Charles Wakefield, shepherd to Mr. H. Wignore; 200 ewes, 244 lambs. Ditto, for the second greatest number, £2 10s., Jesse Hunt, shepherd to Mr. D. Holborow; 234 ewes, 254 lambs. Ditto, for the third ditto, £2, John Stuart, shepherd to Mr. John Fowles; 265 ewes, 287 lambs. Ditto, for the fourth ditto, £1, Richard Day, shepherd to Mr. E. Drew; 227 ewes, 251 lambs. Ditto, from a flock of 300 and upwards, £2, Thomas Fawkes, shepherd to Mr. C. Ford; 315 ewes, 351 lambs. Ditto, for the second greatest number, John Scrivens, shepherd to Mr. G. Robinson; 309 ewes, 350 lambs.

FARM SERVANTS.

To the agricultural labourer who shall have continued in the employ of his master, or who shall have worked on the same farm (with good character and recommendation) the greatest number of successive years, £2, W. Underwood, servant to Mr. E. Rich, Willesley, 39½ years. Ditto, for the next longest servitude, £2, George Cox, servant to Mr. D. Holborow, Bagpath, 37 years. Ditto, not exceeding 25 years of age, £1, William Neal, servant to Mr. Wignore, of Avening, 10 years.

FOR IMPROVING THE MENTAL AND MORAL CONDITION OF AGRICULTURAL SERVANTS.

To the agricultural labourer or female servant, for the best account of "The Life and Times of Daniel the Prophet," with practical reflections thereon, £2, Timothy Leonard, servant to Colonel Kingscote. A young man named Fawkes had also written an extremely good essay; but he was disqualified from taking a prize, as he had already done so. The committee awarded him £1 to give to some charitable institution.

The Dinner was held at Hunter's Hall, at half-past three, to which about sixty sat down. The chair was filled by Colonel KINGSCOTE, M.P., the president of the society.

The CHAIRMAN then proposed the toast of the evening, "Success to the Kingscote Agricultural Association." He proceeded to say that societies like these were of immense value to the farmers; they diffused intelligence and a high tone of feeling among all in the neighbourhood, and united all classes upon many occasions. There was great good in the monthly discussions which the members carried on during the winter. The most moonlight nights were selected for this purpose, and profit was derived by everyone who took part in them. There was a strong feeling throughout the country that something more ought to be done for the education of the farmer. He was himself on the council of the Royal Agricultural Society; and he was also put upon the education committee of that council, which was appointed this year. There had been much discussion on the subject; and the majority of the committee were for only taking up the existing machinery of middle-class examinations, and adapting it in the best way to agriculturists. Those subjects were published; and the committee had decided to aid the examination of the agricultural class in botany, chemistry, geology, and kindred subjects. Now he himself took a different view. He thought the Royal Agricultural Society ought to begin with a practical examination in agriculture. The majority were against that; but Mr. Holland, Mr. Randall, and himself put forth a protest. The argument of the majority was, that a practical examination could not be carried out, for that you could not get examiners of the same mind; and that pupils would come from different parts of the country, where entirely different systems of farming were pursued. Well, all he could say was, it ought to be tried. This little society had taken a step very much in the right direction. It had established a class for instruction in chemistry; and he was sure any man must be a dolt who could not understand the extremely clear and valuable instruction given by Mr. Church. It was a useful subject for farmers to take up; and he hoped other classes equally useful would be formed. He did his best in committee to get the Royal Agricultural Society to give prizes in aid of agricultural knowledge like this. The farmer was under difficulties as regarded the education of his sons. There were few places suited to farmers' sons as regarded their means and requirements: they needed a good general and practical education. They were colleges in Devon and Suffolk for carrying out this object; and there ought to be such in every county. It was necessary that there should be a practical and a physical education. He had no doubt that the masters of those ploughmen who took prizes to-day could handle the plough skilfully, and show their men how to do it. It might be said that this county had the Royal

Agricultural College at Cirencester; but that, he thought, had overshot the mark altogether. It was too expensive; and, as to their management, they had been obliged to give up their farm to a tenant-farmer. If they could not make it answer, all he could say was, they ought to. He concluded by proposing the toast, and, regretting the absence of Mr. Harrison, the president, coupled with it the name of Mr. Burnett, the secretary.

Mr. BURNETT responded at considerable length. He said he had occupied the position as vice-chairman six or seven years ago, and was delighted at the growth of the society. He contrasted its present position with its beginning. At the first meeting the ploughing was wretchedly bad; the ploughs could not keep on their own land, and were running on to their neighbours'; but to-day the ploughing was excellent, and he did not believe that superior could be seen in England or elsewhere. During the past season they had had some very instructive lectures, and also many most useful and interesting discussions, in which all could take part and benefit by the interchange of ideas. Mr. John Morton had offered to give them the introductory lecture of the ensuing course gratis, and his subject was to be Education. He felt that it was needful that something should be done for a purely agricultural education. That education ought to be practical, and he would guarantee to find within the limits of this society ten or twenty young men who were fit to stand before any examiner in practical agriculture. But when he came to the Oxford examination that was a different thing, and the difficulty was to combine the two branches of education at a rate within the farmer's means. Having referred with approval to the chemistry class, he said he had used his best exertions as secretary, and this match to-day and the attendance at dinner would stimulate him very much.

Mr. T. A. STOUGHTON returned thanks.

Colonel BULLER rose to propose "The Tenant Farmers." He alluded with regret to the fact that there was no entry in the class for farmers' sons, and urged that they ought to be learning their fathers' trade, and that they ought to be in a position to teach their men how to handle a plough properly. In the county of Devon there was a capital school of the kind referred to by the Chairman, under the superintendence of Mr. Breerton, where a good education was obtainable at a

reasonable price, and he did not see why such a school should not exist in every county. Although on these occasions "politics are strictly and entirely forbidden," yet as both the members were present he would call their attention to the question of the repeal of the malt tax. The county had chosen to adopt free trade, rightly or wrongly; and *prima facie*, therefore, there ought not to be any tax at all upon malt. But on the other hand, its abolition would cause a revenue loss of five or six millions, and he would ask those present if they were prepared to substitute an increased income-tax for any part of this. Reverting to the toast, he remarked that the landlords needed good and confidential tenants, in whom they could place confidence, and who placed confidence in them. He did not believe there was in England a more straightforward class of men than the tenant-farmers, and therefore he had the greatest pleasure in proposing their healths.

Mr. ROLT: I have a toast to propose, and it would be a serious fault to omit it—the "Health of the Agricultural Labourers." I desire to give it not as a mere ceremony, but, as I hope you will receive it, from the heart. You will readily believe that with my political sentiments, which are the sentiments of all of us here on this subject, none of us propose to elevate the labourer into the governor of the country. That is not our intention; but it is our intention and duty to elevate his mental, moral, and physical condition to the utmost of our power: that is our duty. It is the duty of the landlord: it is especially the duty of the tenant-farmer; it is the duty of the clergy; it is the duty of every one of us. They are the bone and sinew of the country, and without them we can do nothing; and while we feel and declare that as long as there must be hewers of wood and drawers of water their condition cannot be that of affluence or ease, nor can they be placed in a condition, at present at least, of governing the country, yet we owe so much to them—our comfort, our happiness, the well-being of the country depend so entirely upon them—that when we neglect their mental, moral, and physical condition, and do not do our best to promote it, we neglect our most sacred duties. I call upon you to drink the better and happier condition of the agricultural labourer, pledging ourselves to do all that lies in the power of each of us to promote his prosperity.

HEREFORD AGRICULTURAL SOCIETY.

ABANDONMENT OF THE SHOW FOR THE PRESENT YEAR.

On Wednesday, Sept. 13, a special meeting of the members of the Herefordshire Agricultural Society was held at the Green Dragon Hotel, to consider the propriety of abandoning the show of stock for the present year, consequent on the cattle plague. The Rev. Archer Clive, the president of the Committee, was in the chair.

The SECRETARY said that in consequence of a letter which he received last Friday morning, signed by some members of the Society, he consulted Mr. Jancey, the vice-chairman of the Committee, and other members, and it was decided that a meeting should be called to take into consideration the propriety of abandoning the show for the present year, in consequence of the cattle plague which had broken out. There had not been time to advertise the meeting, but other means had been taken to give it publicity, and bills had been sent to Leominster, Ledbury, Ross, and other places. He had received several letters from persons who usually exhibited, but some were applications for certificates.

On referring to the letters, it appeared that two only of the writers expressed opinions as to the propriety of holding the show, viz., Mr. Haywood, of Moccas, who thought it should not be held, and Mr. Nott, of Glasbury, who doubted the desirability of holding it. The others were merely applications for certificates in the usual way, in the event of the show being held.

The SECRETARY added that some members had paid their subscriptions, and others had not paid. About £84 had been received for subscriptions for the present year, a balance of £37 from general subscriptions of last year, and £15 for prizes for the current year, making a total of £166 in hand. If the

show were not held, it would become a question whether or not the money subscribed on account of this year should be returned, and then there would not be enough to pay the expenses.

The CHAIRMAN said that if the meeting decided that the money should be returned, the expenses must be first paid, and the balance only given back.

Mr. TAYLOR (Showle) thought there should be no money returned, and that the subscribers would not expect it.

The CHAIRMAN said the first thing to consider was the desirability, under the present circumstances of the country, of holding a show of cattle this year. As there were many persons in the room better qualified than himself to give an opinion on such a question, it would perhaps be superfluous for him to enter into it; but as there was a possibility of some of their herds being attacked by the disease before October, he thought it would be expedient to defer the show altogether for the present year.

Mr. DAVIS (Webton) said he quite concurred with the chairman. Having so lately had a large show, and the disease being prevalent in neighbouring counties, he thought it would be prudent to keep away cattle from distant parts by abandoning the show for this year.

Mr. J. E. JONES said that on the previous day he had attended the Warwickshire show, at which there was a large number of entries, but very few animals exhibited, the breeders being afraid of the disease. The show was, indeed, considered quite a failure. He thought it would be wise to abandon the show for the present year, more especially as they had recently had the meeting of the Bath and West of England Society.

The CHAIRMAN said that several gentlemen whom he had spoken to on the subject agreed in the opinion that it would be desirable to abandon the show for this year.

Mr. TAYLOR said that if the show were held, a great many breeders who usually exhibited would not send their stock; the show would consequently be a failure, and therefore he thought it would be very wrong to hold it.

The CHAIRMAN said the question for decision was one which

all present must have more or less considered in their own minds before they came to the meeting, and therefore he should at once put it to the vote.

It was then unanimously resolved that the usual October show shall for the present year be abandoned.

A resolution was then passed to the effect that the annual subscriptions should be paid as usual, to meet expenses already incurred; the balance to be carried to next year's account.

THE DIGESTIVE ORGANS OF THE HORSE.

At the usual monthly meeting of the members of the Wimfrith Farmers' Club, Mr. Blake, veterinary surgeon, of Wimborne, delivered a lecture on "The Digestive Organs of the Horse."

Mr. BLAKE said: Gentlemen,—The subject I have selected for my thesis this evening, viz., "Diseases of the digestive organs," will comprehend those affections which are most frequently met with in our agricultural stables. It will be necessary to take a cursory view of the various organs forming the digestive apparatus, and to make a few remarks on the process of digestion. First we have the lips for gathering together the food; next the incisor teeth; then the molars or grinders, between which the food undergoes the process of mastication, and becomes insalivated by the pouring out of saliva from the various salivary glands, and which secretion is conveyed into the mouth by a duct peculiar to each gland. The pellet of food being masticated and insalivated, is passed back to the pharynx and through the œsophagus into the stomach, where it is acted on by the gastric secretions and becomes a chymous mass; it then passes through the pyloric opening of the stomach into the first small intestine, which is called the duodenum, and in which it meets with the secretion from the liver and pancreas, then into the jejunum and illum; these comprise the small intestines. The food then passes into the cœcum, thence into the colon, next into the rectum, whence the effete or excrementitious matter is ejected, the nutritious parts of the food having been absorbed by the lacteals through its whole course from the stomach, and passed into the circulation for the formation of new blood. In cattle and sheep the stomachs are four in number, viz., the rumen or paunch, the reticulum, the omasum, and the abomasum; the last is the true digestive stomach, the others being preparatory, and reducing the food by the process of rumination and remastication, and afterwards, by tuberculation between the muscular leaves of the omasum, into a proper state for entering the fourth or true stomach. Throughout the whole course the digestive canal is lined with mucous membrane, has strong muscular walls, and are externally covered by the serous membrane, which is called peritonæum. I shall, I hope, have said enough to make myself understood on this matter, and will at once take into consideration the diseases of which I am about to speak. The first, beginning at the mouth, will be disease caused by

Dentition or Cutting of Teeth.—From a few months after birth until five years old the process of teething goes on; but, although limited to that time, the growth of the teeth continues through life, so that, in fact, at no period of life is an animal exempt from the influence of dentition, which is the reason that we find occasional cases of lampas in old as well as in young horses. The effects of dentition on the constitution are fever, catarrh disorder, glandular enlargements, cough, ophthalmia, irritation, and derangement of the bowels and urinary organs, loss of appetite, and emaciation. Long continued irritation would bring on a susceptibility of disease, rendering the body more prone to be acted on by morbid agents, and increasing the violence of disease when once set in; for this reason, when young horses are unwell, it is necessary to examine the teeth, particularly the tusks, which, if prominent and accompanied by much redness of the gums, should be let through by making a crucial incision down on the tooth and the removal of any temporary teeth which appear to obstruct the growth of the permanent or coming set. In these cases it will be necessary to diet the animal on easily masticated food—bran, crushed corn, linseed, carrots—and pay

attention to his bodily health by means of laxative and fever medicines.

Lampas.—According to D'Arboval, a French veterinarian, this word is of French origin, and is a stable term which has found its way into veterinary medicine from its having been figuratively used to signify the palate or inside of the mouth. What we understand by it is, an enlargement or bulging of the bars of the mouth, being in some cases lower than the surfaces of the teeth. This enlargement depends on congestion of the blood vessels and effusion of serous and albuminous matter into the cellular membrane, attaching the bars to the palatine bones. Although in young horses this is generally attributed to dentition, yet in old horses some people ascribe it to other causes, and imagine they have much to do with the animal's health and feeding. No doubt it sometimes produces soreness at the same time. In these cases the loss of appetite will probably be traced to some other cause. Many a poor horse is made to undergo the torture of having his bars burnt out with a hot iron to satisfy a prejudice, when it would have been better and more humanely treated with a lancet.

Diseased Teeth.—Should any exist they should be removed, and if they become sharp and wound the cheeks their edges should be taken off with a tooth-rasp. Parrot mouth is not a disease but a malformation, the top jaw overhanging the lower, and thus preventing the animal from collecting and ensing his food, particularly when at grass; such animals should be kept in the stable, or diseases of teeth are frequently met with. Pharyngitis is frequently met with in conjunction with influenza, and is sore throat, in which we find there is great difficulty of swallowing, a rosy discharge from the mouth, with occasionally fetid breath, fever, acceleration of pulse, loss of appetite, cough, and injection of the mucous membranes. Here, as in all cases of illness, I would advise the use of clean and cool stables, covering the body with cloths, bandages to legs, sloppy mashes, gruel, and soft food for diet, moistened plaisters to throat, a little nitre put in water, an ounce a day. Should the symptoms not subside blisters should be tried.

Choking.—Occasionally a portion of food becomes lodged in the pharynx or œsophagus. Grain, potatoes, carrots, swedes, and even with hay and vetches, I have seen horses choked. Greedy horses are most liable to be thus affected, from swallowing their corn whole, and instead of passing to the stomach, it accumulates in the œsophagus and blocks up the passage. The symptoms are—the horse leaves off feeding, and makes every effort to swallow; should he not succeed his throat and neck become spasmodically drawn up, and he makes a peculiar noise, expressive of his own anguish, and exciting the compassion of his attendant. Should he attempt to swallow water it returns through the nose, and saliva runs from the mouth. An examination by the throat often shows us the seat of the stoppage. If in the pharynx, remove with the hand; if out of reach, at once have recourse to the probang, not too large a one, nor with violence; if not removed in this way it must be cut down on and the impactment removed.

Diseases of Stomach.—Plain, simple, and little varied as the diet of the horse is, it would be imagined that his stomach would rarely experience any disorder, and in point of fact from the quality of his food it rarely does; but it is liable to great abuse from the quantity of aliment introduced, the animal being so subject to the will of his master that he often goes for a long period without food, and then is supplied with so large a quantity that his stomach becomes over-filled. The

stomach of the horse, as compared with other viscera, as also with the bulk of the body, is remarkably small; the reason for which appears to be that it might not contain a sufficient quantity of food to impede the process of respiration by its pressure on the diaphragm, and physically to incapacitate the animal from sustaining exertion on a full stomach, the horse being often called upon to exert himself after a full meal, and as the stomach is so small it stands to reason that it requires filling oftener than the stomach of other animals. A dog does well on one meal a-day, but the horse will not do well unless he is feeding for a considerable part of his time. At grass he is constantly grazing; in the stable he is fed three or four times a day on corn, and if not supplied with hay will set about eating his litter; for, however nutritious his food may be, experience teaches us that quality will not prove a substitute for quantity. By the laws of physiology we cannot suddenly change the habits of an animal or of any of its constituent organs without entailing disease, although alterations may be by degrees introduced and become so confirmed by time and usage as to constitute in effect the natural habits of an animal. The most fatal disease of this organ in the horse is generally known as staggers, and is the result of a distended state of the stomach from eating greedily a quantity of food after long fasting. It most frequently occurs amongst cart-horses and those of coarse breed. The best way to avoid it would be by the use of the nose-bag, or in the stable of using iron-bars across the manger, that the animal may have more difficulty in collecting his food. When the stomach is surcharged with food without any tympanitic distension, it does not appear to give any local pain, but gives rise to cerebral symptoms. The horse becomes drowsy, rests his head in the manger or against the wall, takes food into his mouth and goes to sleep with the same; he moves about his fore feet, the breathing becomes stertorous, the eye aromatic, pulse slow and tardy, respiration slow and oppressed, excretions diminished. The treatment must consist in endeavouring to get the food to pass from the stomach. We cannot vomit the horse, and the means generally adopted is the giving cathartic medicines—linseed oil and aloes in solution, together with stimulants, as carbonate ammonia in conjunction with enemata. The stomach-pump has been suggested, but I have not seen it used. It is generally advisable to extract blood to relieve the congested condition of the brain: but unless the stomach is relieved of its load, fermentation will take place, gaseous distension ensue, and rupture terminate the case.

Indigestion.—In man, whose digestive organs are somewhat differently constructed from those of the horse, the stomach is considered the grand agent of digestion; but in the horse, as a graminivorous animal, who is always feeding, his food occupying a large space compared with the size of his stomach, it would appear to be not so important an organ as in the human system. To say therefore that indigestion is owing to some fault of the stomach alone would be taking too confined a view, equally so to hold that organ to be faultless, as we shall frequently find some other organ implicated in this derangement. The intestines are more frequently the seat of indigestion than the stomach, from the short time the food remains in that viscus, and the much that is required in the intestines to complete the process of digestion. Symptoms: The horse does not thrive, and although his appetite is good, sometimes voracious, at one time he feeds well, badly at another; sometimes it is depraved, he eats dirt, mortar, or any extraneous matters that he can get at; the coat stales, is dry and scurfy, and does not shed well; he becomes hide-bound, and wastes away; his feces are unhealthy, have an offensive odour, and is either lighter or darker than usual, and when broken appears to consist of lumps of loosely compacted chopped hay and undigested corn, sometimes covered with slime. In the stable the animal is inclined to be costive, but when at work is subject to diarrhoea; often the skin is covered with eruptions. The ordinary seat of indigestion would appear to be the villous membrane of the stomach or intestines; this membrane in both organs furnishing secretions necessary for the conversion of the food into alimentary and feculent matters. Various other causes may be in operation; the secretions from liver or pancreas may be deficient in quantity or defective in quality, the food may be unchewed, depending on the condition of the teeth, or from ravenous feeding, or the animal may suffer from worms, but this I take rather as a result than a cause of the disease; how-

ever, should they exist measures must be taken to get rid of them. The subjects of indigestion are generally three, four, or five-year-old horses that have been reared in low, marshy, cold, and poor pastures; the bad quality of their food seems to lay a tendency for disorders of the bowels, which is no doubt accelerated by damp and exposure to weather. Commonly, with change of diet, care, and a little medicine, they outgrow this unhealthy condition; but many remain subject to it through life. Some horses experience indigestion while living in the stable; occasionally a horse turns out unthriving and looking bad without being off his feed or being unable to work, yet we cannot discover any positive disease. We inquire as well as we can as to the state of his digestive organs, and generally find them to be in fault. The ordinary mode of treatment is by aperients, a mild dose of calomel and aloes at intervals of a week or fortnight. If worms are present this will generally effect a cure. Tonics, alteratives when the liver is inactive, the hydrg. cum creta with vegetable tonics may be given daily; change of food, mucilaginous drinks, linseed, crushed corn and chaff, bran, carrots, swedes, &c., may be tried; but occurring in the stable nothing does better than a run at grass if the season admits.

Spasm of the Intestines.—The most common perhaps of all diseases amongst farm horses is spasm of the bowels, commonly designated fret, colic, or gripes. The causes of this affection are ordinarily drinking cold water whilst the animal is warm, change of water, especially from pond or river water to that which is impregnated with mineral salts, suppression of perspiration, sudden chills, wetches and other green foods, new wheat straw, and pea haulm; barley dust especially I have found to produce this disease, and in fact any food of a rough nature and containing much woody fibre is likely to produce the disease, especially when the horses are newly fed on it. I think it would be well here to draw a distinction between the affection where it can be traced to be the result of the nature of the food of which the animal has lately partaken, from it as occurring after drinking cold water, &c., as in the former case we shall be sure to have an accumulation of undigested rough food in the large intestines to be got rid of and requiring purgative medicine, whilst in the other we have simple spasm more under the control of medicine, and yielding more quickly to its action. The seat of spasm is in general the small intestines, though it is occasionally met with in the large. In all cases of spasm of the bowels it will be necessary to make ourselves acquainted with the cause if possible. Has the animal had cold water and change of food? Has he been exposed to the inclemency of the weather, &c.? These questions not affording a clue, examine the animal's pulse. Is it much increased in number—are the mucous membranes injected—is there any hernia existing? This especially in entire horses is a necessary inquiry, as inguinal or scrotal hernia frequently exists, and becoming strangulated would give cause to the symptoms of spasm, viz., the horse suddenly crouches down his hind quarters, twists and flicks about his tail, throws himself down rather than lies down, looks back at flanks, rolls about, gets up again, but quickly to fall again, rolls on his back, dashes himself about, moans with pains, perhaps passes a small quantity of feces, and may be strains to urinate; cold sweats bedew the body, the ears and legs become cold; these symptoms unrelieved soon become aggravated, the horse becomes nearly frantic with pain, the pulse will be quick and thready, the countenance assumes a deathly aspect, the animal lies down more quickly, or stands for a longer period, and sometimes stands till he drops dead. Millers' horses are subject to calculus, arising from being fed on bran. The presence of some foreign agent is necessary to form the calculus—a nail, bit of lead, or some such matter taken with the food is left in one of the large intestines, generally the cæcum; here it becomes covered with a coating of mucus, and rolling round collects on it the earthy particles of the bran, and in time arrives at great weight and size, and causes death. The treatment of spasm consists in the use of such medicines as by their action on the nervous centres will relax muscular contractions, and are called antispasmodics; spirits and aromatics rank amongst these, the reason why gin and pepper sometimes relieve. *Ethers, Spts. Ann., Ar. Tuel. Opi., and Hyosciamus* are the best agents combined with aloes or linseed oil. Enemata are very necessary, and are easily administered by a funnel carved to admit of the cup part remaining upright, whilst a tube extends at a right angle, long enough to introduce into the anus; hot fomentations to the

abdomen, mustard and hot vinegar plasters and bleeding. If the symptoms do not subside, recourse must be had to further bleeding, blisters, calomel, and opium; but this no doubt would by this time come under the notice of your veterinary surgeon. Volvulus and intussusception are often the result of spasm, and are not discovered till after death, nor would much good occur from doing so unless by opening the animal we could untwist or set free the impacted or strangulated part.

Enterites.—The causes which would produce spasm would also cause enterites; in fact, all cases of spasm that I have ever seen terminate fatally have always run into this form of disease, occasionally complicated with volvulus intussusception or stoppage of the bowels. Constipation may be viewed both as cause and effect, collected and hardened feces being in themselves irritant, obstructive, and subversive of the functions of the bowels, and may lay the foundation for an attack of inflammation; bad food, calcoli, irritating matter of any sort, over-fatigue, and consequent irritation of the bowels, suppressed perspiration, cold from exposure, wetting skin when hot with cold water, worms, and spasm may be mentioned as causes. The symptoms of enterites are, as far as regards the expression of pain, similar to those we find in spasmodic colic—as lying down, rolling about, looking back on flanks, and sweating; but in enterites we shall find the visible mucous membranes much injected, pain on pressure to the abdomen, and the pulse quick, full, and wiry; the horse also lies down more carefully, the belly is drawn up, and the countenance looks anxious. Enterites is not so sudden in its attack as spasm, and is generally ushered in by previous indisposition, constipation of the bowels, diarrhoea, or an unhealthy state of the feces, want of appetite, dulness, and fever. The respiration

is hurried, nostrils dilated; he looks frequently on his flanks and groans with pain; body bathed with sweat, sometimes hot, at others cold; ears and legs cold; tail erect and quivering; convulsive trembling of the muscles. The animal becomes delirious with pain, and dashes himself about, rendering it unsafe to approach him. Mortification at length sets in, when the symptoms abate; but, alas! this is only the forerunner of death, which speedily ensues. The treatment must be bold and energetic; bleeding to faintness, purgative medicine, opium, and calomel, counter-irritation to abdomen, which should be speedily and powerfully applied. Mustard plasters, hot fomentations, enemata, tobacco-smoke, enemata, oleaginous and opiate enemata must all be tried; bandages to legs, stimulating embrocation to the same, clothing body, administering warm gruel, and keeping a good bed under the animal, plenty of pure air, and the removal of anything that the horse is likely to injure himself against in rolling about. If the symptoms become relieved and the bowels respond to medicine, care must be taken after as to diet; occasionally it ends in metastasis, or shifting of the disease to the eyes or feet. And now, gentlemen, I will not trespass further on your time. I fear I have not introduced much novelty; but I hope that by the discussion, should any ensue, I may have done a little to contribute to your interest (applause).

A cursory conversation ensued upon various details, and afterwards a cordial vote of thanks was proposed by Mr. Randall, seconded by Mr. Sly, and adopted with acclamation, for the valuable information that had been afforded by Mr. Blake. That gentleman having expressed his acknowledgments for the compliment paid him, the formal proceedings of the evening terminated.

THE PRINCIPLES AND PRACTICE OF DISINFECTION.

The following document has been prepared by direction of the Lords of the Council. It is headed "Memo-randum on the Principles and Practice of Disinfection, as applicable to the present Epidemic of Cattle Disease. By J. L. W. Thudichum, M.D.":—

I.—PRINCIPLES OF DISINFECTION.

"1. The term 'disinfection' signifies the removal and destruction, or destruction and subsequent removal of the products of destruction, of all matters actually being or containing products of disease capable of reproducing disease in other animals.

"2. If the same processes and means as used for this purpose are applied to the purification and deodorization of places and things not actually infected, but capable or suspected of being infected, then these preventive measures are practically and properly included under the definition of disinfection.

"3. The reproducers of the infectious matter or contagion are all kinds of cattle of the ox tribe, which also are at present in this country the only animals liable to its specific effects. It is probable that the contagion adheres with particular pertinacity to all secretions and discharges from sick animals. For this reason, feces or droppings, urine, ruminated food, all secretions from the mouth, nose, and eyes, and any sore parts of the surface of the diseased animals must be considered as the principal and primary carriers of the infectious matter or plague poison. It is also probable that many parts of animals which have died from the cattle plague, or have been killed during advanced stages of the disease, are infectious, some because they are primarily imbued with the contagion, others because they have been in contact with it after the death of the animal. Skins, hides, hair, horns, and hoofs must therefore always be treated with precaution. The chances of infection by flesh, fat, cleaned guts, and blood are, perhaps, more remote, but cannot be lost sight of.

"4. The cattle plague, although affecting every part of the animal, shows its visible effects most extensively in the intestinal canal. It is believed, and apparently upon good grounds, that the intestinal discharges are the principal agents,

upon the distribution of which mainly depends the spread of the disorder.

"5. It follows from the above that all articles which have been in contact with a diseased animal, or any of its discharges, particularly feces, are capable of carrying the infection for an indefinite time, and must be looked upon as being actually infectious to other healthy animals. Such are racks of wood or iron, cribs or mangers of wood, iron, or stone; articles used for fastening animals, leather collars and straps, ropes and chains; all harness of any animals used for drawing, and all carts, waggons and carriages which they have actually been drawing; the stalls or sheds in which animals have been standing; the whole lengths of the gutters and drains through which their urine has been flowing; the entire surface over which their manure has been drawn, and all implement with which the removal has been effected; the entire dung-heap upon which infected manure has been put, and the fluid contents of the manure pit or the special receptacle for the urine; yards or sheds in which cattle have been kept to tread down long straw, and the whole of such straw and manure, as also the ground beneath them; paths and roads upon which diseased cattle have walked or been carried; fields and meadows upon which they have been grazing; all carts, carriages, trucks, and railway trucks in which diseased cattle have been conveyed, and all the platforms, railings, bridges, and boards upon which they have been moved thereto; as also all apparatus which has been used to pen, tie, lift, haul, lower, and fix them; the clothes, and particularly shoes and boots, and iron-pointed sticks of drivers and their dogs; the apparel of all cattle-herds or attendants, particularly their shoes and boots; the shoes and boots of all persons visiting places where diseased cattle are or have been standing; and in general the clothes of all persons visiting infected places, ships, and all parts of the platforms, stages, stairs, and bridges, hoists and cranes used for embarking and landing the animals; markets and all sheds and pens and implements used in contact with cattle; slaughterhouses, and all persons and implements in them which have been employed upon sick cattle, as also sundry parts or organs which come from sick animals killed in slaughterhouses; knackers' yards, trucks, or carts, horses, men, and implements which have been employed in the disposal of sick or dead animals; wells and ponds from which

diseased cattle have been drinking, or into which any portion of their excreta has had any opportunity of flowing directly or indirectly; all fodder, grass, hay, straw, clover, &c., and particularly remnants of fodder upon which diseased cattle have been feeding; and, in general, all persons, animals, places, buildings, and moveable things which have been in contact with matters proceeding from diseased cattle, or with such diseased cattle themselves. To the above-mentioned places and things any of the processes and agents enumerated and described in the following may have to be applied.

“II.—PRACTICE OF DISINFECTION.

“A. Disinfection by Earth.—1. Burying.—All matters that can be buried, so as to remain covered with a thick layer of ground or earth, are innocuous. The ground chosen for such interment should be dry. The quickest, and cheapest, and most certain way of disinfecting an animal dead from the plague is to bury it entire.

“2. The droppings and all straw and other matters contaminated therewith may also be buried into ground where they are not likely to be disturbed for a long time. The places from which such droppings have been removed to be cleaned and disinfected, as will be described below.

“3. Manure heaps and the down-trodden manure of cattle yards, if they have become infected by even a small quantity of the droppings of a diseased animal, should be carefully shifted to a suitable piece of ground, and there be transformed into compost heaps. A layer of manure one or two feet in thickness should be covered all over with six inches of dry earth, ashes, and mineral rubbish: upon this another layer of manure may be placed, and then again a layer of earth, and so forth, until the whole of the manure is stacked. It should be covered all over with a continuous layer of earth of from six inches to one foot in thickness. If the manure-heap or yard manure cannot be shifted, it may be covered on the spot with a layer of dry earth, after which all animals are to be kept away from it.

“4. If the floor of any shed or stable in which diseased cattle has been standing is not constructed with special watertight and impenetrable material, it must be assumed to be infected to the depth of at least six inches. This ground should therefore be removed, together with any stones, pavements, or woodwork which may have been in contact with it, carted to a piece of dry land, and buried. Half-rotten wood is a particularly favourite carrier of infection. Mortar, bricks, loam, or any other lining of the sides of a pen in which a diseased animal has been standing, should be broken out and buried.

“B. Disinfection by Fire.—1. Burning.—All infected articles of a minor value, or made of incombustible materials, can be disinfected by exposing them to a heat which will char organic matter. To this class of articles may be reckoned racks of wood or iron; cribs or mangers of wood, iron, or stone; leather collars and straps, ropes and chains; dry manure, residues of fodder from which diseased cattle have eaten; and all such small articles of little value which can easily be replaced by new ones. Chains may be exposed to a dull red heat; all other articles may be heated over a fire of coal, brushwood, or straw, until well scorched. All new articles of ironware should be bought in a galvanized state, to prevent the formation of rust, the accumulations of which form convenient seats for infectious matter; and for the same purpose it is desirable that iron articles which have been disinfected by heat, as above, should afterwards be either galvanized or, at least, while hot, be treated with resin, to cover them with a durable varnish, or should be varnished or painted.

“C. Disinfection by Chloride of Lime.—Chloride of lime or bleaching powder, is the most powerful, the cheapest, and most easily managed of all artificial disinfectants. It can be had everywhere, and at any time, and in quantities sufficient for every purpose. It should, as much as possible, be applied in solution, of a strength varying somewhat with the particular purpose for which it is to be employed; and, after it has been allowed to act upon the surface or matter to be disinfected a reasonable time, should be washed off, together with all products of decomposition. As chloride of lime does not destroy only the infectious matter in a mixture, but destroys all organic matter without distinction, it is not applicable to large quantities of matter, such as the manure of cattle, dung-heaps, &c., inasmuch as twice or three times the weight of

these matters of chloride of lime would be required for their effectual destruction and disinfection. It is further inapplicable to all matters rich in ammonia, particularly putrid urine, as it destroys the ammonia, and evolves a large amount of gases, some of which have a repugnant odour, and are perhaps not quite innocuous. But for the disinfection of surfaces of things and places, no better or more suitable agent than chloride of lime is at present known to science.

“D. Special Directions for the Disinfection of Stables, Sheds, Vans, Railway Trucks, and Cattle Ships, and of Persons and Things connected with them.—1. After such a place has been cleaned by mechanical means, scraping, &c., as much as possible, and all manure and dirt has been carefully buried, the entire surface which has been contaminated, or is likely to have been contaminated, should be covered with a layer of chloride of lime in powder. The powder should be worked about with a broom until equally distributed. It is intended to disinfect the water to be used in the washing process which is now to commence. Clean water from a hose in which it flows under pressure, or from a force-pump, garden-engine, or from large watering-pots, or water-cans, or poured freely from buckets, should now be applied to the entire surface by one person, while another at the same time scrubs the entire surface, and particularly all crevices, joints, and irregularities. The washing water and chloride of lime are then to be worked down the gutters into the sinks, cesses, or natural watercourses. No washing water from any infected place or thing should ever be allowed to flow into any cesspool, urinal, dung-heap, pond, sewer, or natural watercourse, without having previously been mixed and stirred with a liberal amount of chloride of lime. When the place has thus been scrubbed, until the water flows off clean, it is ready for effectual disinfection.

“2. For this purpose a solution of chloride of lime in water, in the proportion of one pound of the powder to one gallon of water, is made. For the lair of one animal from six to ten gallons of such fluid should be prepared. This fluid is now distributed over the whole surface to be disinfected, gradually by squirting from a syringe, or by pumping through a force-pump, garden-engine, or by watering from a watering-pot or can with a finely pierced rose. All wood-work, stones, bricks, cement, mortar, all fixtures of whatever material, should be well wetted with the solution and immediately be scrubbed with a hard brush. Floor and ceiling are also scrubbed, and the whole is left in this wet state covered with the chloride of lime solution for at least one hour, during which time care is taken that no parts become dry.

“3. As the chloride of lime and the products of its decomposing action upon infectious matters may be hurtful to cattle, these matters have to be carefully washed off by a second and final flushing. For this too much water and too much scrubbing cannot be employed. Care should be taken to apply the clean water always to the highest parts, so as to cause it to flow thence to the lower parts, and to wash away the waste from the lower parts before applying any fresh water to the upper parts.

“4. Care should also be taken to rinse and flush every broom which has worked away sediment and waste from the lower parts into and through the gutters and drains before applying it again to the clean upper parts. Care should also be taken that the working persons should not step from the dirty or partially-cleaned places on to the clean ones, as this may suffice to bring infection back to the disinfected place.

“5. Lastly, all persons employed in this work, having swept and flushed the gutters with the same care as the lairs, are collected, together with all the engines and tools which they have used, as near as possible to the sink or place of final egress of water from the premises, and there disinfected as will be described.

“The tools, such as hooks, forks, spades, hoes, barrows, &c., are scrubbed with the above solution of chloride of lime, and subsequently water, until clean; they are then repeatedly wetted with the solution, and after it has had time to disinfect the entire surface of them they are washed clean and laid up or hung up to dry.

“The workmen then, having finished the disinfection and flushing of all objects and surfaces, effect their own disinfection in the following manner: They wash their boots most carefully with chloride of lime and water, scraping the soles and

scrubbing the seams where the soles join the upper-leather. They wash their hands and arms, and by means of clean rags or sponges they remove any splashes from their clothes. After this they go indoors, remove all clothes from head to foot, wash their bodies, and particularly their hands, faces, hair, and feet with plenty of soap and water, and put on fresh clothes and linen. The clothes and linen which they have taken off should be treated as infected, set to soak immediately in boiling water, and afterwards disinfected, or in water containing two ounces ounces of chloride of lime to the gallon in solution, or containing four ounces Condy's red permanganate of potash fluid in solution; or the clothes and linen should be put in a copper and boiled, and subsequently washed. All articles of little value which are much soiled should be burned on a bright fire.

"E. Disinfection of Live Stock.—1. Live cattle may carry infection in two ways—first, by being themselves infected with the plague, and reproducing the poison; and, secondly, by accidentally carrying the poison from other animals in a dormant state upon some part of their surface, their hair, and particularly their feet. These latter animals may therefore infect others without being or becoming themselves subjects of the plague. All persons, therefore, buying new animals should disinfect them before allowing them to enter their premises. In a similar manner, if in a stable there has been a case of plague, the healthy or apparently healthy animals should all be disinfected.

"2. The mode in which live animals may be disinfected consists in washing them with disinfectant solutions of such strength as will destroy the contagion without injuring the surface of the animal. A solution of two ounces of chloride of lime in a gallon of water is a proper solution for washing the coat of animals. A mixture of four ounces of Condy's red permanganate of potash fluid, with one gallon of water, is also a proper disinfectant solution. For full-sized cows and bullocks &c., several gallons of either of these solutions should be used. Great care should be taken to keep the solution away from the eyes, nostrils, mouth, and tender parts. When the entire surface is washed and disinfected, all disinfectant is removed by the application of great quantities of clean tepid water to all parts. The animal is given a warming and refreshing drink, and is conducted by a clean attendant to the clean quarantine shed. There it should receive fodder, both dry and green, and sop, and plenty of pure cold water, and be rubbed dry with whisks of straw and hay.

"F. The Quarantine Shed.—1. The quarantine shed is intended to keep the new and suspected cattle separate for a period of at least ten days, in order to afford the security—to be obtained by observation alone—that it is not actually infected with plague. While, therefore, disinfection of the surface of cattle removes one kind of danger, another (which cannot be removed) can only be kept circumscribed or penned in, and this is done by the quarantine shed. But the keeping of cattle in the quarantine shed would not disinfect its surface with certainty even during a much longer period than ten days. Disinfection of the surface, therefore, cannot supply the precaution of the quarantine shed; and a rigorous quarantine cannot supply the effect of surface disinfection. Both precautions are necessary for perfect security, although either of them, without the other, obviates a particular kind, and a certain amount of danger.

"2. The quarantine shed should be situated in an isolated part of the premises. All manure and urine from it should flow and be carried to a particular place separate and distant from the common dungheap, and be buried daily.

"The utmost cleanliness should be observed in the shed. All tools, pails, currycombs, &c., used in this shed should be used in it exclusively and nowhere else. The person attending the quarantine shed should not be allowed to go into the shed where healthy stock is kept, or permitted to approach healthy stock. No person attending healthy stock should be permitted to approach quarantine cattle, or to go near or into the quarantine shed. But should unfortunately only one person be available for both duties, that person should be allowed to approach quarantine cattle only when clothed in the safety-dress immediately described.

"G. The Safety Dress.—1. This consists of strong water boots reaching up to the knees, well greased all over; of a waterproof coat, buttoned close all the way up in front, and closing tightly round the neck and wrists. The head is to be covered with a cap which takes the air well in.

"2. Every person having occasion to visit sheds in which there is diseased cattle, or suspected cattle, or quarantine cattle, should be provided with the above dress: put it on when entering the place, take it off when leaving the place, and have it disinfected immediately. This precaution should be strictly observed by all inspectors, all veterinarians, or others called in to attend sick cattle, by all dealers and butchers entering sheds, yards, or meadows for the purpose of sale or purchase, and by all other persons coming on the premises on business in connection with cattle.

"3. The owners of stock should not allow any strangers to enter their sheds, yards, or meadows, except in disinfected safety-dresses; and in case this should give rise to difficulties, they will do well to have themselves one or two such safety-dresses at hand, and to cause all persons whose business compels them to enter their sheds to leave their own boots behind, and to put on the long boots, waterproof coat, and special cap. Only thus can they hope to exclude all ordinary and obvious chances of infection from their previously healthy sheds, yards, and meadows.

"H. Measures to be Taken on Premises where Plague has actually appeared.—1. When the plague has actually appeared in any shed, yard, or place, the sick animal should at once be removed with all due precautions. It is certainly the safest and best to poleaxe the animal at once, and to bury it entire, and then to disinfect the particular lair as above described, clear out the stable or shed, disinfect the whole of it, and all the apparatus, also all the animals, and only to let the animals enter the shed, &c., again after it is completely sweet and dry.

"2. If, however, a proprietor is desirous of keeping a sick animal because its illness does not appear severe or fatal, he should place it in a separate shed, which must not be the same as, or near to, the quarantine shed, and be distant from all healthy animals, and so situated that the prevailing wind does not blow from this hospital shed towards the healthy or quarantine shed. The water should also not flow from this hospital-shed towards the others, or the yard, or any meadow, but should be carefully drained away and sent off the premises by a special sink.

"3. To prevent the scattering of feces by infected animals (and also by suspected animals and all animals suffering from diarrhoea), their tails should be so tied to one or other of their horns as to protect them against being soiled by the intestinal discharges, and to prevent them from distributing such discharges by the ceaseless motion peculiar to these organs. The spattering of feces should be prevented by a copious supply of rough straw, with some sand, sawdust, or ashes placed behind and underneath the animal. The straw and feces should be dealt with as has been described. Animals affected with plague or diarrhoea should not be led along streets, highroads, and paths, as they would be certain to drop infectious feces, which would then be distributed over the entire length of these roads by the feet of men and animals, and the wheels of vehicles.

"4. The sick animals should be disinfected repeatedly; their pens should be cleaned and disinfected repeatedly during the course of the illness. This should be done by persons either guarded by the safety-dress, or—and this is safest—by such as may not come into contact with healthy cattle, or have to enter healthy sheds. All tools, pails, fodder, &c., to be used in the hospital-shed to be kept for that purpose only, and never to be used with healthy, or quarantine, or only suspected cattle.

"5. If the proprietor of any dead piece of cattle, whether it has died naturally or been killed, should decide upon dismembering it instead of burying it entire, and upon utilizing the hide, horns, tallow, and bones, he should disinfect the skin, horns, and hoofs, by steeping them for one hour in a strong solution of chloride of lime, containing one pound of the powder in each gallon of water, and afterwards washing them. The tallow should be thickly powdered with chloride of lime all over, and be sent directly to the boilers. It should not be boiled in any vessel employed on the farm. Under all circumstances, it is advisable to let this dismemberment of dead and fallen cattle be performed at the knacker's yard.

"6. Flesh, blood, guts, lungs, and the bones of the head of infected animals should not be trafficked with, as they cannot easily be disinfected. They should always be buried.

1. Disinfection of Meadows, Fields, Roads, &c.—1. Meadows infected by diseased cattle should be carefully cleaned of all dung, by burying each dropping on the spot where it lies, cutting out the round piece of turf with the dropping on it, and turning it upside down. The grass on the entire meadow should then be cut and burned. It should then be left without any cattle for at least a month, including at least two wet days.

2. All roads, paths, streets of towns, or villages should be carefully and frequently scavenged. All carts, vans, or waggons used for carrying manure should be watertight, caulked, and painted, and should not be permitted to ooze and drop their fluid or semi-fluid contents on the road over which they are drawn. They should be kept clean and disinfected, as a precautionary measure, by the proceedings above described.

III. GENERAL RECOMMENDATIONS.

“In conclusion, it must be pointed out to farmers, dairy-men, and all persons having charge of cattle,

“That the same great measures which are known to maintain and restore the health of human beings will also maintain and restore the health of cattle.

“Pure air; dry, spacious, well-ventilated and well-drained clean sheds; clean and dry meadows; plenty of pure water; frequent currying and washing; the prevention of the development, by the destruction of the germs, of internal and external parasites, particularly entozoa; proper food in suitable quantities, and at proper times; protection from inclement weather; the utmost cleanliness in the removal of manure; the storing of the manure at a great distance from the cattle-shed, and, in addition, the most conscientious observance of the precautionary and disinfecting measures above described—all these measures and agents together will secure the utmost possible health of stock, and the prosperity of the agriculturist and dairyman. But the neglect of any one of them will make the stock liable to become infected, and the more so the more several or all collateral conditions of the healthy existence of animals are neglected. The negligent man is, therefore, certain to lose, to injure his neighbour by defeating his precautions, and to damage society; but the watchful and painstaking man will be rewarded, not only by the preservation of his property, but particularly by the consciousness that it has been preserved by his own care and attention, and that thereby he has also benefited the State.”

THE CATTLE PLAGUE.

The following address has been issued by the Veterinary Committee of the Royal Agricultural Society of England:—

The gradual extension of the cattle plague in different parts of the country, together with its appearance in localities hitherto exempt from it, induces the Veterinary Committee of the Royal Agricultural Society to call upon its members to co-operate with the Government, and with other agricultural societies, in the efforts which are being made for suppressing the disease.

The existence of this disease being regarded as a national calamity, it was right that the Government should take the initiative in adopting means for its suppression; and their having done so leaves little for the Royal, or any other Agricultural Society, to do, except to second the efforts of the Government.

The several orders in council which have been put forth, well calculated as they are to arrest the progress of the malady, will, nevertheless, prove non-effective to a considerable extent unless they are backed by individual exertion. One of the chief, and in many instances the only cause of the extension of the disease into several fresh districts, has been the reckless manner that many persons have dealt with infected cattle. Not only have these been driven from place to place, and turned into fields separated only from large herds of healthy animals by an ordinary fence; but many have been sent to fairs and markets, and thus, by commingling with others, have spread the disease far and wide. All preventive measures are thus rendered of little avail; and unless practices of this kind are prevented by the vigilance of agriculturists and others, thousands of cattle will be lost to the country, in addition to those which have already perished. Everyone should be impressed with the fact that the disease is the most infectious as well as the most fatal which is known to affect cattle, akin in its deadly effects to the smallpox of sheep, but not giving warning to persons by an eruption upon the body. Like smallpox of sheep, also, the poison lies latent in the system for several days after being inhaled, and during this time the animal gives no indications of being affected, so that the most cautious persons may be deceived in the making of purchases. Another fact of equal importance, but not generally known, is that the special poisonous material, or infectious matter, on which the disease depends for its existence, is multiplied, to an extent scarcely to be estimated, in the system of every fresh victim; so that it is quite possible for one diseased animal to be ultimately the cause of the death of thousands. The veterinary committee conceive, therefore, that the precautions which have been put forth by the society's veterinary inspector will not be inaptly repeated here, although they have been previously brought to the notice of the members of the society through the ordinary channels of publication.

These precautions are:—

1. That all persons should abstain as much as possible from the purchase of “store stock” in fairs and markets, and should not purchase from cattle dealers without a warranty against the disease.
2. That all newly-purchased cattle of every kind be kept apart from others for a period of not less than twelve to fourteen days.
3. That cattle, the subjects of this disease, should not be allowed to remain in any meadow or pasture field, unless they can be perfectly isolated from all other animals, as well as kept at a distance of not less than a hundred yards from all roads along which sound cattle may be driven.
4. That every animal, which is violently attacked with the disease, be killed and buried without delay, and that the skin be placed in some disinfecting fluid before being sent off the premises.
5. That no animals be allowed to go near to the burial-places until several weeks have elapsed.
6. That no person who has the charge of the sick cattle be allowed to go near the healthy ones, and that all indirect communication by dogs or other animals between the infected and the healthy cattle be strictly prevented.
7. That all healthy cattle after removal from the diseased be well washed and cleansed.
8. That no fodder or straw which has been used about infected cattle be taken to other animals, or even thrown into the fold-yard, or upon the manure-heap, until it has been first well incorporated with chloride of lime, or some other disinfecting powder. When practicable, it is desirable that all such fodder and straw should be burnt.
9. That all manure in the sheds or stables occupied by diseased cattle be daily sprinkled with some disinfecting powder, and that no evacuations of the diseased be removed without being first disinfected.
10. That all sheds and stables, in which diseased cattle have been located, be thoroughly washed, cleansed, and ventilated, and likewise disinfected by whitewashings with quick lime, before any other cattle are placed therein.
11. That all railway cattle-trucks, station-pounds, ships used in the cattle trade, wharves and other places, where cattle are brought together, be kept as clean as possible by frequent washings; and that disinfectants be used whenever there is reason to believe that they have been occupied by diseased animals.
12. That no store-stock, milking cows, or cattle of any kind which have been exposed to the influence of the infection, by being located with the diseased, be sent to any fair, or market, in less time than a month after such exposure.

13. That in all cases in which it is determined to slaughter animals which have been on a farm or premises where the disease has broken out, but which animals are believed at the time to be healthy and fit for human food, they be sent with all due care and caution direct to the nearest slaughter-house, if not killed on the premises, and as a further precaution their skins be placed in some disinfecting fluid.
14. That, although experience has shown all animals of the ox tribe, whatever may be their age, sex, or condition, to be susceptible of the action of the infection, it is nevertheless essentially necessary that every cause which tends to weaken the constitution should be carefully avoided. Protection from inclement weather, supplying animals with nutritious food, such as cake or corn, and especially with pure water, are imperatively demanded at a juncture like the present.

In addition to a strict observance of these precautions, the committee would remind the members of the necessity of recognizing the early symptoms of the disease, and not confounding them with those belonging to other maladies common to cattle. For this purpose they here insert the leading symptoms of the cattle plague, and of the two other epidemic affections to which cattle are subject :

THE CATTLE PLAGUE.

The early symptoms of the plague are usually a *remarkably dull and dispirited condition* of the animal, which will stand with its head hanging down, ears drawn back, and coat staring, refusing all food, and occasionally shivering. The eyes have an unusual expression of anxiety, and a mucous discharge flows from them, and also from the nostrils. The skin is hot, but sometimes chilly; the temperature varying from time to time. The extremities are cold; the breathing short and quick, and frequently accompanied with moaning as an indication of pain. The inner part of the upper lip and roof of the mouth is reddened, and often covered with raw-looking spots. The bowels are occasionally constipated; but, in most instances, diarrhœa soon sets in, the evacuations being slimy and very frequently of a dirty-yellow colour. The vagina is often intensely reddened. The prostration of strength is great, the animal staggering when made to move. *In milch cows the secretion of milk is rapidly diminished, and soon ceases altogether.*

PLEURO-PNEUMONIA, OR LUNG-DISEASE.

The attack is mostly insidious, the animal appearing at the outset to be but little affected. The eyes retain their brightness, often to the termination of the illness. The appetite is generally diminished, but rarely lost, excepting in the advanced stages of the disease. A short, dry, husky cough is one of the earliest symptoms: it continues throughout, and is easily excited by moving the animal, especially if such movement is sudden. There is rarely any discharge from either the eyes or nostrils. The breathing is greatly increased, and becomes painful as the disease advances. A dull sound is emitted on gently percussing the side of the chest over the diseased lung. Firm pressure applied to this part will also cause the animal to shrink. There is little or no alteration in the fecal evacuations, excepting in the last stages of the malady, when a diarrhœa comes on. The warmth of

the body and the extremities is often retained to the last hours of the illness. In milch cows the quantity is lessened; but the animal will frequently yield a fair quantity to the very last. The affected animal will sometimes live for weeks.

THE MOUTH-AND-FOOT DISEASE.

Attack sudden. No premonitory symptoms, excepting in very rare instances. The animal frequently smacks his lips, and shows by the movements of its tongue that the mouth is the seat of suffering. The saliva flows freely from the mouth, and accumulates also as a frothy fluid around the muzzle. An examination of the mouth shows the existence of large blisters on the tongue, and often on the inner part of the upper lip. They are few in number, and always white in colour. The animal seldom refuses food, but rolls it about in his mouth, and often drops instead of swallowing it. There is little or no disturbance of either the breathing or pulse; nor is the temperature of the body altered. The evacuations are also natural. In many instances the feet are affected as well as the mouth, and blisters will form between the toes, causing the animal to walk tenderly, and frequently to catch up one foot after the other and shake it, as if to dislodge something which was producing pain. In milch cows the teats are occasionally affected with blisters, especially at opening of the milk duct, which lead on in this situation to sores and crusts, and prevent the ready flow of the milk. The disease is of short duration, rarely produces death, and frequently exists simultaneously among the sheep, pigs, and poultry of the farm, as well as among the cattle.

The preceding description of the most prominent symptoms of these several affections will, the committee hope, so far guide the agriculturist that he may at once be enabled to decide on the nature of the disease; but in any case in which a doubt may exist, he should lose no time in calling to his assistance the professional aid of a veterinary surgeon.

The committee would further observe that they have witnessed with satisfaction the formation of mutual protection or compensating societies in some of the counties in which the disease has broken out. Such societies must prove important auxiliaries to the means employed for suppressing the disease by inducing persons to give immediate notice of its appearance, and by doing all they can to carry out the rules and regulations herein named, as well as the several Orders in Council which have been issued by the Government.

In conclusion, the Committee have to state that, although strongly believing that it is to preventive and not curative means the country must look for the extermination of the cattle-plague, they have not neglected the important subject of combating the disease by medical treatment. In conjunction with the Royal Veterinary College, measures have been adopted by which diseased cattle are admitted into the Infirmary of that institution for treatment. Hitherto, the results of medical treatment have nowhere been so satisfactory as could be wished; but should a successful mode of treatment be discovered the same will immediately be made public. Another and a very great advantage arising out of diseased cattle being brought to the College is, that means are afforded to veterinary surgeons—who arrive in London from all parts of the country, and even from foreign states—of seeing the disease in its several stages, and also of being present at post-mortem examinations, and learning from the professors the whole of the details of the treatment which has been adopted.

THE CATTLE DISEASE.

There is a cloud since last autumn, which I fear is coming up with the wind and will be soon above us; and that is the cattle disease. I have taken much interest in watching this disease, because I have been connected for many years with the governorship of the Royal Veterinary College, and I can assure you that every exertion has been made in order to ascertain the best mode of treating the cattle attacked with that disease. The principal of our college, Professor Spooner, is now at Vienna, to confer with the men of veterinary science from all parts of Europe, in order to ascertain what may be the best remedy and treatment. Professor Simonds, our second professor, is at work under the direction of the Privy

Council; and Professor Varnell, our third professor, was in college the last time I saw him, engaged in the preparation of additional boxes for the purpose of providing sufficient accommodation. Gentlemen, perhaps you will forgive me if I touch upon this subject rather more fully, for though it is a cloudy subject, still it is one that presses upon the interests of every man present. We saw that many of the stalls were vacant today. I do not say that those are unnecessarily prudent who have withheld their stock, because I fear we have to deal with a disease which is comparatively new in England. I was not satisfied with the veterinary opinions as to what this disease really is. There was a concurrence of opinion

that it was the German rinderpest; but I requested an eminent medical friend of mine, who is a member of the Epidemiological Society of the medical profession—a society devoted to tracing the causes, the phases, and the nature of disease—I requested this friend to ascertain at the last meeting of that society what was the general opinion of the medical profession as to the nature of this disease. Well, I touch upon this subject because if we do not know the nature of the disease it is impossible for us to guard against it as we should, and it is impossible for veterinary surgeons to treat it as they ought; and I will quote, without naming him, what my friend reported to me: "From all I can learn (he writes on the 5th of September) among my colleagues at the Epidemiological Society, this cattle disease is considered to be the rinderpest of the Germans, or, as we call it, the steppe murrain. It is an affection of the whole mucous membrane, of a specific character, which requires stimulants for its treatment." Forgive me for having given you the result of these inquiries: for, after all, the first object of this Association is business, and the first business we have to deal with at present is a knowledge of the disease which threatens us, and, secondly, the means of prevention and the treatment which should be adopted. Well, gentlemen, I know it has been said that the measures recommended by the Government are severe. I am an independent member as you know—no tied supporter of the Government; but I believe the measures adopted by Government have in a great measure stayed the plague. And I think we ought to be grateful to Government for the measures they have adopted, because, and I say it with full knowledge, the nature of this disease has been so imperfectly understood on the continent by the veterinary profession, the treatment of it has been so difficult, owing to the rapidity of its progress, that as yet the veterinary science has not been able to suggest any treatment which the Royal College has ventured to commend for general adoption. The Royal College, represented by Professor Simonds in England and Professor Spooner at Vienna are hard at work, and they concur with the medical opinion which I have cited, that the first treatment of this disease as typhoid should be stimulants. Forgive me for having touched on this subject, but I wish to back the judicious recommendation of Lord Leigh in regard to insurance. In foreign countries it has been found necessary to draw a sani-

tary *cordon* around districts in which this disease has prevailed, and to hem in within the sanitary *cordon* not only the cattle, but those who were engaged in their treatment; and I cite this in order to urge you whenever the disease may present itself at once to separate the diseased animals from the others, and if you would treat them, treat them apart. I am convinced of this—that we must look to the prevention rather than the cure of a disease which runs its course in twenty-four hours, and which does not therefore admit of the treatment which should follow on the use of stimulants. Therefore we must look to stimulants, and it seems to me, as time is drawing on, that every farmer should look to the condition of his cattle-sheds. Use all cleanliness and disinfectants. You will excuse me for going into detail, but I speak on the authority of several veterinarians. There is one measure which is essential. You must break the change which must occur in the health of the animals caused by the removal from pasture to the cow-shed, and render that change as gradual as you can, so that the health of the animal may be as little as possible disturbed. I again ask you to forgive me for troubling you on these matters, but I have been for twenty years governor of the Veterinary College, and for many years chairman of the governors, and I thought I could not do you a better service than to render you thus briefly the result of their experience and advice. After all, although it may be doubtful whether it is prudent that the cattle should be congregated together, even for such occasions as the present, there can be nothing which should prevent the owners of cattle meeting as they have done to-day. On the contrary, there is every reason that you should meet. The less desirable it is that the cattle should be congregated together on account of the prevalence of this disease—which I trust may be stayed by the preventive measures which your own good sense may suggest, in accordance with the dictates of the Privy Council—there is the more reason that you should meet. It is necessary that you should ascertain the localities in which the disease prevails; and above all, it is in such meetings that you combine those means of mutual assurance which are essential to the prevention of disease; for if there is no mutual assurance, if there is no organized system for compensation against loss by this disease, depend upon it there will be an unwillingness to comply with the preventive measures.—*Mr. Newdegate, at the Stratford-on-Avon Meeting.*

SMITHFIELD CLUB CATTLE SHOW FOR 1865.

This annual show will take place on Monday, the 4th of December next, and will continue open to the inspection of the public for the four following days, closing on Friday the 8th, at 10 o'clock P.M. Several important alterations and additions have been agreed upon by the council, of whom the Right Hon. Earl Spencer, K.G., is the President, which have met with the general concurrence of the members. There will be eleven distinct breeds of cattle admitted to the show to compete for the moneyed prizes and medals. These will include Devons, Herefords, Shorthorns, Sussex, Norfolk, and Suffolk polled, Long-horned, Scotch horned, Scotch polled, Irish, Welsh and cross and mixed-bred cattle. These will be arranged under thirty-four separate classes. To the five classes of Devon beasts sums amounting to £250 will be given, with a silver medal to the breeder of the best animal shown in each class. A similar sum will also be awarded, with a silver medal, on the like terms, to the Hereford and Shorthorn classes. Moneyed prizes of £115 will be appropriated to beasts of the Sussex breed, with silver medals to the successful breeders in each class. To the Norfolk and Suffolk polled classes £50; to the Long-horned ditto £30; to the Scotch horned £45; to the Scotch polled £70; to the Irish ditto £30; to the Welsh £55; to the cross and mixed breeds £125, and a medal to each—making a sum total of £1,270, with thirty-four silver medals, as prizes to the cattle classes, besides two sil-

ver cups of £20 and £40 each. There will be admitted into the show twelve distinct breeds of sheep, viz., Leicesters, Cotswolds, Lincolns, Kentish, long-wooled sheep (not being of the above breeds), Southdowns, Hampshire, or Wiltshire Shropshire, Oxfordshire, mountain-bred, Cheviot or Dorset, and cross-bred kinds, and £545 will be distributed in sums varying from £5 to £20 to the successful exhibitors, whilst a silver medal will be presented to the most approved breeder of stock in each class, and three silver cups of £20 each. There will be four classes of pigs; £30 and a silver medal will be apportioned to the competitors in each class. Six silver cups, valued at from £20 to £40 each, will be adjudged to the several exhibitors of the best steer, heifer, long and short-wooled sheep, as well as also pig, shown in any of the classes; a gold medal also to the breeder of the best steer or ox, as also heifer or cow, shown in any of the classes. Furthermore, distinct money prizes of £5 each, accompanied by a silver medal, will be given to the successful exhibitors of the various animals under extra stock, and three silver cups of £10, £15, and £20 to the butchers who shall purchase the largest amount of cattle, sheep, and pigs. In addition to these prizes, the herdsman, shepherd, or pig-feeder, who has fed and attended the animal gaining the first prize in each class, will be presented with a sovereign and a framed diploma with a suitable inscription.

C H I P S.

FARM-YARD MANURE; WATER AND ITS AGRICULTURAL USES.

INTRODUCTORY.

The traveller, as he wends his way through the forests which line the river banks, or stretch far into the plains of a country which he is exploring, and desirous to bring home with him record of his researches into the natural history of the districts which he traverses, sees with regret stately trees or huge rocks which he would like to but cannot remove. Contenting himself then with what he can get, he breaks a stone here, lops off a branch there, or anon gathers up a chip which the woodman's axe has left upon the ground, and, putting these into his wallet, brings them home as samples of the production of the land he has visited. So, to keep up the simile, the wanderer in the woods—may we not also say the wilds?—of agricultural literature, sees abundant evidence of the wealth of the country around him, and may be struck with the desire to bring home some of its products for the benefit of those who have not the like privilege with himself of wandering amidst “fresh fields and pastures new.” But the traveller cannot bring away a tree or transport a rock; he is compelled, therefore, to return with “chips” from them only, and present them to the notice of his friends at home as samples of what the country produces. It has been our lot for a long time to watch with interest the products, so to speak, of the agricultural country, and rich in many things undoubtedly it is, but these are not always to be met with when wanted, being now and then hid deep in the bosom of the earth, stowed away in some cleft of the rock, covered with leaves, or far in the depth of a forest, and it is only those who have a knowledge of the intricacies of the various districts, and of the signs which they afford of the wealth which they contain, that can readily and easily find what could not be perhaps found at all by less favoured explorers. Not in any way claiming or being desirous to claim the position of one who knows the country thoroughly, but contenting ourselves merely with that of one who has some slight knowledge of it, we believe that in our “museum” we have some samples or specimens worth looking at as indicative of its wealth. Time is not given to all to travel, and it is no small pleasure to be able to give to others its benefits without its trials and fatigues. This, we hope, in some modified measure to be able to do. To descend from the imaginative region of simile to the prosaic field of fact, we purpose to give at intervals, and in briefest fashion, essays on various points connected with the theory and practice of farming in all its branches. These will, as a rule, have their origin in the elaborate papers which are scattered here and there throughout the pages of our agricultural publications not much known, or if known not easily got at, and which may, therefore, be said to be new to many readers. We design them to be, as said above, very brief, so that they can be taken up in the spare moments which are much more frequently obtained from the labours of the farm or the cares of the fold than the longer intervals of ease with which few farmers are blessed. Our essays, or what may with more propriety be called essays *à l'essai*, will, when founded upon the elaborate papers above alluded to, bear the same relation to them as the “chips” which fly from the carpenter's axe to the tree or the log which he is fashioning into shape: small relatively, they will nevertheless show the grain of the tree from which they have been hewn.

But we do not purpose to content ourselves merely with giving samples of the labours of others; we may now and then be bold enough to present samples of our own. These will have to be taken for what they are worth, and may be more frequently illustrative of the poverty than the richness of the parcel of which they are samples.

1. FARM-YARD MANURE.

There is amongst the vexed questions of agriculture—and they are certainly numerous enough—none perhaps on which so much diversity of opinion exists as the treatment of farmyard manure, and its value in different conditions. Some praise long or fresh—some, short or rotten dung. Some hold it should be made or kept in covered yards; some, in open pits; others, again, advocate the utility and the economy of spreading it over the surface well, allowing it to lie exposed for a length of time to the atmosphere and its ever-changing conditions; while this very process is denounced as the most wasteful and absurd of all the modes of treatment which can be devised. Let us gather up a few “chips” from various hands on these points. It is obvious enough that farmyard manure contains certain elements of fertility—may, it is a universal manure, for it contains all. There must, then—so common sense would, at all events, dictate—be one way in which these elements can be better kept or returned in the body of the manure than another. In this, as in other matters, it is no new thing to say, that there must be a right and a wrong way of dealing with this substance. To illustrate how this may be, it will be necessary to glance at the most important chemical facts connected with the subject. Nor need the reader be deterred by the notice that this will be a dry detail, or a long one—few words will place the whole matter clearly enough before him. Farmyard manure is divided into two parts—organic, or substances which can be burnt; inorganic, or those which are incombustible. The organic substances are made up of carbon, oxygen, hydrogen, and nitrogen; and these form a variety of groups the action of which is most interesting. Of these four substances, nitrogen is almost always in a state of excitement when present in farmyard manure exposed to the air; and the other substance with which it most readily combines is carbon, which in itself is rather disposed to remain inert. The mixture, however, of the nitrogen and carbon of the manure brings at once into existence a remarkably rapid action, which, as Professor Tanner says, “rends asunder the individual elements of the various matters in the dung, and affords them the opportunity of forming new associations or combinations.” What they are a brief sentence or two will explain. Air and moisture being present in the dung—as, practically, it is present in all heaps of it—the fermentation caused by the union of the nitrogen with the carbon compounds goes rapidly on, and brings about the disposition of the various elements contained in the manure or forms new combinations: one of these is the union of the nitrogen with the hydrogen, which forms (1) ammonia; next, the union of the oxygen with the carbon, which forms (2) carbonic acid; and the union of the oxygen with the hydrogen and the carbonic acid, which gives (3) humic acid. But these, whenever they are present together, do not remain separate, but combine to form fresh arrangements: thus, the carbonic acid unites with the ammonia, and carbonate of

ammonia (one of the most volatile of compounds) is formed. With the combinations of humic acid and ammonia we have the humate of ammonia, a compound which is not volatile; but although not volatile—that is, not easily passing off from the manure to the air—it is very readily dissolved in water; and the black, rich-looking liquid which we see running from manure heaps is evidence, then, of this dissolving process going on. Hence may be derived the practical value of having the sides and bottom of our manure pits impervious, so that all this drainage shall be kept. Hence also that other recommendation which some authorities insist upon, of having the manure pit covered, so that large quantities of rain shall not be mixed with the manure. It is obvious enough that this solution of humate of ammonia will be better carried on in the soil near the plants which it is to fertilize, than in the manure pit. At all events, it is folly to allow it to run away, as in too many cases it is allowed to run away and be lost. One result of the process of fermentation, which we have shown the cause of, is the loss of weight which the manure sustains; thus 100 cwt. of fresh manure is decreased to 80 cwt. half-rotten, 60 rotten, and 40 very much decomposed. The loss of weight is caused by the withdrawal of carbonic acid, carburetted hydrogen, and other substances, which being of very little value as fertilizers, do not cause much loss of manurial value in fermented manure. Fermentation should not, however, be carried too far; for it is worthy of note, that, as the process goes on, the decaying particles have the power of withdrawing ammonia from the air, and of retaining it till removed by water, or by the decay being pushed further on; so that, if pushed further on, the ammonia escapes into the air—that is, there is more ammonia present than can combine with the humic acid present, which is under these circumstances the case. But the value of dung is not measured by the presence or amount of the organic substances we have named. The inorganic or mineral portions are of the utmost value as fertilizers, or as tending to build up the plants to which it is applied. The value of these inorganic substances has been shown to be fully one-third of the whole value of the chemical ingredients of the manure. These inorganic substances play an important part in the formation of our crops, as will be seen from the numerous analyses of them, which have been published from time to time in the columns of this journal. These inorganic constituents are all present in farm-yard manure; but they are not capable of being taken up by the plants till they are in a state of solution; and the process of fermentation in dung we find “the surest plan of rendering” them available by bringing about this state of solution; for many substances, difficult of solution in water under ordinary circumstances, are readily dissolved when brought under the influence of the fermentative process going on in the manure-heap. The evolution of heat is always one of the results of fermentation, or rather fermentation cannot go on without heat, and this heat is the result of the chemical union of the organic substances which we have already described. The greater the heat the more rapid the decomposition; but this heat, or rather the combination of the compound which causes the heat, cannot be produced without the presence of air and water. But curiously enough, it is in the supply of these in proper quantity that the excessive heat which would otherwise exist in the centre of a manure-heap is kept down; for while we admit these, we open up, so to speak, apertures by which the heat escapes, and the temperature correspondingly reduced. It is difficult to name the exact quantity of moisture with which manure should be supplied; if it is deficient in quantity a very volatile compound—carbonate of ammonia is formed, the carbon having been unable to get hold of a sufficient quantity of hydro-

gen to form the more volatile compound, the muriate of ammonia, which a proper supply of water would secure. Further, this volatile compound, arising from deficiency of moisture, is rapidly passed into the atmosphere through the agency of the excessive heat, which again results from the absence of moisture. Hence, as Professor Tanner says, acids *are* the greatest sources of loss in the management of dung; for we adopt measures to promote a violent fermentation; and *yet we do not* supply moisture to render the decomposition most complete and beneficial. “This authority therefore recommends that, after a manure heap has been turned, or, in fact, during any period when the fermentation is vigorous, especial care should be taken to give fresh supplies of moisture, which will powerfully promote the formation of those ammoniacal compounds which are of the greatest agricultural value.” The drainage from the manure-pit will be most useful for this purpose: hence the value of the Continental modes of forming manure-pits, in which there is a special place made, into which the liquid drains, which is pumped up and poured over the surface of the manure. But while on the one hand moisture is required, too much must be avoided: hence if the climate is a very wet one, the manure-pit should be covered. Indeed, our authority says that it will be safer in any case to do this; for it is an easy matter to pump water or the draining of the heap itself over the heap. So far we have considered the making of manure in its original pit; but as this becomes filled, it must be removed. Moreover, the exigencies of farm-labour often render it necessary that in the comparatively idle days of winter the manure should be carted on to the fields, so as to economise time in the busy days of spring, when it is to be used. And here we see the diversity of opinion we in the beginning of the paper adverted to—some advocating the placing of the dung in heaps, carefully made; others the spreading of it out upon the surface. The following is Mr. Lawrence’s mode of forming manure-heaps in the field. He selects three or more spots, in proportion to the size of the farm, by the side of the roads, and in positions the most convenient for carting the manure on to the land. In these places he excavates for about two feet in depth, and on the floor of this he lays some three or four inches in depth of common soil, to absorb the liquid from the manure placed above. The manure is tilted from the carts into the spaces; and it is then spread evenly over the surface, and well trod upon. The filling-in and spreading is carried on till the manure reaches a level of about 12 inches from the ground. From this point it is gradually taken in, so as, when finished, to represent the sloping sides of a roof, the top of which is slightly rounded, this being done by treading on the top. As the successive layers of manure are laid on the heap, salt is sprinkled over the surface, the proportion of salt to the manure being one bushel to the cart-load. In a day or two the heap will sink to what may be called its normal level, when the whole surface is plastered over with moistened earth. Thus prepared, the manure will keep a long time. When the manure-heap in the field is opened, and the dung found to be insufficiently rotted, the whole must be turned over and allowed to remain for ten or fourteen days. But, as Professor Tanner says, we must be equally careful as before to prevent all loss from drainage; and the top should be covered with soil even more freely than before, to prevent the loss from the ammonia escaping. But while preventing all loss from drainage, care must be taken if necessary to give a supply of moisture to the heap, so as to promote fermentation.

II. WATER AND ITS USES.

The gift of *water* is one of the most precious of those which a beneficent Creator has supplied to man, the value

of which it is indeed impossible to over-estimate. For whether considered as a necessary element, ministering directly to nutrition, or enabling us to assimilate other nutritive substances, as a means to increase bodily comfort, or to add to bodily health, a plentiful supply of pure water is of essential importance to man's physical well-being, as well as to the animals placed under his care. It would be easy to descant upon the numerous advantages of a plentiful supply of water; but this has been done by other and abler pens than ours. It is a curiously suggestive circumstance, that while so much has been written and said of late years as to the importance of a supply of water to our town houses, little—very little has been said or written on the importance of securing a supply for our country ones. The subject of "water and its agricultural uses" has recently been taken up in the pages of the Journal connected with agriculture, and has been discussed with all the full detail which its importance deserves; from these papers we take the following "chips," which will be of interest to our readers, and on the point we have just above alluded to the following will not be amiss. After alluding to the fact that the Sanitary Inspector always confines, or at least almost always confines his care to the towns and cities, over-looking quite the country villages, hamlets, or houses, and that in consequence a large amount of ignorance prevails amongst us as to how matters really are in rural districts, the writer goes on to say, "A search, however, into the circumstances of these rural districts will result in establishing the fact that of the sanitary evils connected with them as striking and as painful as those connected with many of our town districts, about which so many woful Jeremiahs have been raised, this of the water supply question is one in connection with which not a few startling evils may be traced. For, in many cases, in rural districts it is easy enough to meet with cottages which have no direct supply of water given to them. Upon their inhabitants is too often entailed the labour—all the more painful, and all the more unequalled for after a day's work at their special calling—of going to some distance from their homes to get a supply of water. Nor is it seldom the case that this supply is quite unfitted for healthy use. The whole subject of water supply to the cottages of our labouring agricultural population is one which has never met with, but most assuredly demands, the earnest consideration and care of those who are mainly interested in the maintenance of their healthy condition." That this consideration has now a chance of being given to it, signs here and there are existent. For example, Professor Voelcker read a paper on "water" before the Royal Agricultural Society, and in the discussion which followed its reading one of the speakers remarked that great interest had of late been manifested on the question of water supply to the houses of the agricultural labourer; and drew attention to a fact which we hope is not true of all, but which we know to be true of too many cases, that circumstances in general seemed so to concur that the same spots upon which labourers were worst housed were also the most unfavourable for a supply of water;" and in concluding the discussion the learned Professor himself said, that "the bad quality of water with which cottages were generally supplied in agricultural districts was really a hardship that pressed with peculiar severity upon the industrious and thrifty labourers." The disease then, being so generally known, and its evils understood, surely the remedy will speedily follow; but alas! how, in these matters, slowly the "we shall" follows upon the "we should!" Not at present going into details of the sources of supply open to use in rural districts, and which require special means more or less expensive, we would here in a sentence or two draw the attention of the reader to that source of supply which is abundant in our climate, and

which can be readily and cheaply availed of, at any time: we refer to *rain-water*. It certainly is astounding how indifferent people are to this heaven-sent gift. Rain water is, without exception, and beyond all dispute, the purest and the softest we can obtain. For washing purposes, both of person and clothing, it is unrivalled. So far as personal use of it is concerned, we make bold to say that once one knows its value, he will go to the use of other qualities of water with the greatest possible reluctance. Of its value for the washing of clothes no one has any conception who has not used it, or is aware of the advantages attendant upon this use. Not only are the clothes better washed, more quickly washed, less quantity of soap required than when harder water is employed; but the wear and tear of the fabric is very much less. All these points are of great importance to all classes of the community; but of the greatest importance to the labouring population, whose means should be economised to the utmost. It has been calculated that by the use of soft rain water while the expenditure of soap in washing a given amount of clothing was 3d., by the use of hard water it was three-fold or 9d., the labour in the case of soft-water being 5s., in hard 10s. The harder the water, moreover, the less "pure" are the clothes, and the more frequently must they be washed, and the greater therefore the wear and tear. On an average, where rain-water is not used for clothes washing, the money spent in washing a shirt during the period of its use is double the cost of the shirt itself, material and making: this calculation is made on the basis of the cost of dear cotton, as it is now; in its normal or ordinary condition, or rather what this was before the panic, five times the cost of the shirt was expended in washing it when hard-water was used. The extent of roofing in our farm buildings being generally very great, a large supply of rain-water can be obtained from this source alone, and it is better to save it and store it up than allow it to drip from the roof and make the walls damp. In London, the amount of water obtained each year from 400 square feet of roof surface has been estimated at 5,000 gallons. Another rule has been given by which an approximative estimate of the quantity of water may be obtained. Reduce the superficies in feet of the roof into inches, and multiply this by 231: the quantity will be the number of gallons obtained during the year for each inch of rain-fall of the district.

ORANGE TREES AS AN INVESTMENT.—During the last few years the supply of oranges has been greatly improved in France, and amongst the new or improved sources are Cannes and the Gulf of Juan, in the Mediterranean, nearly the whole neighbourhood of which is being converted into orange plantations. It is said that Paris alone consumes annually about five millions of oranges grown there; and there is a large trade beside in orange flowers, which are the produce not of the sweet, but of the bitter, or Seville orange. At present the price of orange flowers at Cannes is not more than 4d. a pound, but it is said to be on the rise. In good situations a tree 15 years of age will yield about 16lbs. of flowers each year, and in an orangery, by the Gulf of Juan 1,550 trees of 17 years' growth give on an average above ten tons of flowers. Besides the flowers these trees yield a certain amount of fruit, the result of the blossoms which appear after the flower harvest—for the orange tree has a succession of flowers, ripe and green fruit as well as blossoms being frequently seen together on the same tree; and also a third item of profit in the form of prunings and clippings, which fetch 8s. a hundredweight, and are used for the production of inferior scents.—*The Grocer*.

THE CAUSE OF THE CATTLE PLAGUE.

SIR,—Having read in the daily papers many articles which represent what I may call the general rather than the agricultural opinion on this subject, may I be allowed briefly to point out what appears to me erroneous? The arguments are that the disease is atmospheric, and also promoted by the too luxuriant growth of grass, and by the errors in management, which have caused our stock to become less able to withstand such epidemics; that we have occasioned this and other diseases by greedily seeking for early maturity, by feeding with oilcake, and by manuring our plants with artificial manure; in short, it is evidently sought to be implied that as we have brought the disease on ourselves we ought to bear the burden of it, and that the outcry against foreign cattle is only from a selfish desire to once more gain a monopoly of feeding the British public, which, as foreign cattle supplies one-third of the public food, neither can nor ought to be allowed.

Such are the arguments of the papers, and of the public that take them for oracles. A few brief remarks will prove their error.

In the first place, as London is almost the sole mart for foreign cattle; as mutton is consumed to a still greater extent than beef there; and as this cattle trade does not reach the same extent all through the year—as these foreign cattle are, compared to our own, very small, and many only in store condition—it is evidently most unfair to take one week's supply of the number of cattle, selecting that one in which they bore the greatest proportion to British stock, and thence to argue about the comparative meat supply of Britain. In this respect London, so far from being synonymous with Britain, is only the tenth part; and therefore, even taking into account North American bacon and South American dried beef, the foreigner, I am convinced, hardly supplies one-tenth of the meat supply of London, and not a hundredth part of the rest of England.

Meat is doubtless dear; but the cause of this is very plain. In the first place, from the lowness of wheat for the last few years, the poor man has been happily enabled to compete with the rich in its consumption; and, at the same time, an unexampled drought has rendered it most difficult for the English agriculturist to keep up his stock at the average number, and has compelled him to expend much more in fattening. The almost total failure of last year's turnip crop and of this year's hay and grass has of course had a very great effect in enhancing the price of meat; and now that turnips and grass are more than ordinarily productive, the diminished flocks and the cattle disease render it exceedingly difficult to obtain stock to feed off the produce.

With reference to the argument that the improvements in agriculture have had a tendency to induce the disease from unnatural modes of feeding, and a greater constitutional weakness, I deny it altogether. I argue, and could give proof, that the British islands are the best suited for live-stock of any part in Europe; that their stock is of a stronger and better constitution, that it is fed in a more rational manner, and that it is kept more in accordance with Nature's rules, and therefore is, as might naturally be expected, free from many diseases which the filthy and erroneous systems practised on the Continent bring on this stock. Taking seasons in which corn bears a fair remunerative price, and in which cattle food is of average productiveness, the British agriculturist can (in the absence of widely-spread murrain or disease) fully supply the

wants of the British public at a reasonable rate; but imported diseases, such as sheep-pox and cattle-murrain, of course defeat the plans, put a stop to business, and, in the end, add to the consumers' expense: for instance, now in many counties the cattle trade is paralyzed, and the consumer, fearing to eat beef, adds to the demand for, and consequent price of mutton. I argue that British stock is of better constitution and quality than foreign, and that early maturity has not injured it in these respects. The broad chest, the round barrel, the muscular haunches of our breeds prove this, in comparison with the eat ham, flat sides, and pot-bellies of foreign stock, which too often have the appearance of having been starved during growth, and are, we find, almost impossible to be made fat. Do not we see that our Galloway and Highland cattle, our Herefords and Devons are far more hardy than the Norman, Breton, and Alderney cattle? As to comparison with our pigs and sheep, it is absurd. The foreign have neither the constitution nor the aptitude to fatten. In fact, early maturity, aptitude to fatten, and constitution go together; and it is only when we seek to promote great milking properties in our stock that we are liable to injure their form and their constitutions.

As to the mode of feeding: England, with our numerous small pastures, in which we can isolate the different kinds of animals, the artificial grasses, and the growth of turnips and mangold, by which we can supply green food throughout the year, and our mode of keeping cattle, either in the field in summer, or in open sheds in winter, is so congenial to the health of our stock, that I am convinced there would be little serious disease unless it was imported. Compare it with foreign systems. In Belgium, so often puffed off in comparison with us, the cattle are kept in close buildings all the year, the lung disease causing great devastation. In most parts of France the peasant cultivator leads out his cow or goat to feed on the narrow borders between the allotments. In Switzerland the cattle feed on the mountains in the summer, in winter are shut up in close stables and fed on hay. In Russia immense herds range the steppes in summer, and in autumn are driven in immense numbers to the large cities in order to be killed and preserved in a frozen state during winter, the reserve stock being kept in close sheds, while snow covers the frozen plains. In short, the European system is this: Immense flocks and herds are kept on the mountains and waste plains in summer, so that there can be no careful breeding or selection, and infection has full scope, and in winter shut up in close buildings, kept unnaturally on dry food, as hay and straw, and often, for the sake of animal warmth, in the same building with the human residents. Now, suppose want of fresh air, unnatural food, place left uncleaned, and in many instances the human fellow-inmates suffering from contagious disease, and we need not wonder that, with the alternation of plentiful summer food and winter starvation, foreign stock are inferior in constitution and maturity, and that their sheep bring over the "sheep-pox" to us, and their cattle the murrain.

I do not say but that there are intelligent men on the continent endeavouring to introduce our breeds and improve their own; but while the system there is either one of peasant cultivation or of immense domains, while enclosures are almost unknown, and while the winters over all the north are of such great severity as to *compel* the unwholesome stabling system, it is absurd to suppose that they can compete with us, or that their stock can be as healthy or as well bred.

W. R.

ODDS AND ENDS OF FARMING FACTS.

(69) The fact seems frequently to be overlooked that weeds do more than merely occupy the space of land which might otherwise be profitably cultivated: they exhaust the soil almost as much as the valuable crops. We say "almost;" for, in the absence of direct experiments upon the point, we only conjecture it; but we may say that the conjecture is well founded. So far as analyses have been carried out, Professor Buckman shows that field-weeds carry off from the soil an abundant supply of alkalies and phosphates.

(70) The extirpation of weeds in pasture-land is best brought about by continual mowing down of their leaves. Let the "fact" be always borne in mind, as the great authority on weeds says, "As the leaves are the lungs of the plant, never in such cases allow the lungs to develop themselves."

(71) A steep for seed-wheat is thus given in a contemporary journal: "Mix one pound of chloride of lime with one gallon of water; after which, let it stand to settle for a short time, and draw off the clear solution. In this steep the seed-wheat for two hours; then drain, and dry with a sufficient quantity of sand and ashes."

(72) Vetches—a capital forage-plant—grow best upon a loamy soil. It is not usually designated a rotation crop, being, like peas, more a "catch" or stolen crop. The best crop for it to succeed is a cereal. Sown in autumn, it is ready to be cut for green food for cattle early in the spring, after which the land may be prepared for a root-crop. The seed should be sown at intervals, in order to secure a succession of cuttings.

(73) The proportion of husk of the bean in pod to the seed is 14 to 86. The average weight of a bean may be taken at 12 grains, and 580.30 to the pound.

(74) The straw per acre of the wheat crop amounts to, on an average, from 3,000lb. to 3,500lb.; of the oat, 2,700lb. to 3,500; of the barley, 2,100lb. to 2,500lb.; of the rye, 4,000lb. to 5,000lb.; of the bean, 2,700lb. to 3,200lb.; of the pea, 2,700lb.

(75) The following are average gross crops of the seed-producing plants of the farm: Wheat, 25 to 30 bushels; oats, 40 to 50 bushels; barley, 35 to 40 bushels; rye, 25 to 30 bushels; beans, 25 to 30 bushels; peas, 25 bushels.

(76) The following has been recommended as a manure for the turnip-crop: Two cwt. of superphosphate, one cwt. of bonedust, half-cwt. of guano.

(77) The kohl-rabi—erroneously termed the "turnip-rooted cabbage"—is held in high esteem by some feeders. Mr. Baldwin, who has experimented on the plant, states, however, that, as a milk-producing plant, he has not found it to be so valuable as some have stated it to be. The true name for it is the *Brassica rapo-brassica*. One great advantage the root undoubtedly possesses is, its power to resist severe frosts. We have had crops of it cut in the severest winter we can recollect; and we found them, after long exposure, as sound as could be. We do not, however, recommend them to be given to the cows in a raw, cold state: they are better cooked.

(78) The kohl rabi requires heavy manuring: 25 tons of dung to the acre is the least which should be given, and to this should be added 6 cwt. of superphosphate and 2 cwt. of common salt. Like all the cruciferous plants, the kohl rabi requires this last constituent; it is essentially a marine plant. The best crops are grown from transplanted plants: 8 ounces of seed will raise

plants enough to stock an acre. The field should be prepared the same as for turnips, in drills, with 27-inch intervals. The plants should be dibbled on the summit of the ridge of the drills from 9 to 12 inches apart. The plants should be transplanted in May, June, and up to the end of July. The seed in the seed-bed should be sown for these transplantings respectively in March (beginning), second week in April, and first week of June.

(79) Stockhardt estimates the amount of nitrogen taken by the hay crop per acre at 69.77, equal to 129½ lbs. of ammonia; Liebig at 56, equal to 104 lbs. of ammonia; and Boussingault at 64½, equal to 119½ lbs. of ammonia.

(80) The following analysis of the ash of turnips is by Boussingault. Potash 41.96, soda 5.09, lime 13.60, magnesia 5.34, phosphoric acid 7.38, oxide of iron 1.28, sulphuric acid 13.60, chlorine 3.60, silica 7.95.

(81) Lupines are much cultivated on the continent; they are considered to be specially valuable for sheep-feeding. The great authority on their cultivation in this country is Mr. Chrisp, who wrote an essay in the *Journal* of the Royal Agricultural Society. The following is an analysis, showing their nutritive properties: Nitrogenous or flesh-forming substances 33 to 36 per cent., carbonaceous or fat-producing substances 32 to 37, woody fibre 11 to 12, water 14 to 15, ash 3 to 4.

(82) In making superphosphate, Dr. Anderson recommends the following proportion of the ingredients: One ton of inch-size bones (that is, bones broken to such a size as to allow them to pass easily through a ring one inch in diameter), ¼ ton of sulphuric acid, 60 gallons (or ¼ ton of boiling water). The following is the way of making it: The cistern should be made by preference of lead, or strong wood, and a watering vessel of lead. The bones should be spread in small quantity upon the bottom of the cistern, and the acid gradually poured in upon them from the watering vessel, and at the same time a quantity (proportionate to the acid) of the boiling water.

(83) The following experiments—the results of which show the value of weeding—are reported in the *Journal* of the Bath and West of England Society. 1. Seven acres of light gravelly soil were fallowed and sown broadcast: one acre was measured, and not a weed was pulled out of it; the other six were carefully weeded. The unweeded acre produced 18 bushels, the six weeded acres averaged 22½ bushels per acre, a clear gain of 25 per cent. 2. A six-acre field was sown with barley in fine tilth, and well manured. The weeding, owing to a great abundance of charlock, cost 12s. per acre. The produce of an unweeded acre was 13 bushels, of the weeded 28 bushels, thus showing a difference of 15 bushels per acre, besides the enormous advantage of having the land cleaned for the succeeding crop. 3. Of six acres sown with oats, one acre ploughed out well, and unmanured and unweeded, yielded only 17 bushels: the rest ploughed three times, manured and weeded, produced 37 bushels per acre.

(84) Vatel, the great veterinary of the continent, states that the rate of pulsation of the different domestic animals of the farm is as follows: The horse, 32 to 38 pulsations per minute, an ox or cow 25 to 42, a sheep 70 to 79, the ass 48 to 54, goat 72 to 76, the dog 90 to 100, the cat 110 to 120, the rabbit 120, and guinea-pig 140; of fowls, the hen 140, the duck 135.

(85) In dibbling wheat, experience has shown a good distance between the rows to be 9 inches apart, and the holes 9 inches in the rows, thus making a series of 9

inches square. We have found 12 inches square to give the best results, although we have seen it stated that 5 inches square are the best. This, we should say, is too small. The depth of the holes should not exceed, nor be each less than, 2 inches. The number of grains to put into each hole has been disputed: certainly the minimum is two, but three is a usual number. At 5-inch distances a good dibbler should with three droppers get over half an acre per day.

(86) Onions are said to be an admirable food for fowls, or rather an adjunct to their ordinary food. If given regularly, it is said that they will prevent the attacks of the more ordinary diseases of poultry.

(87) Meat is said by some authorities to be an essential food for poultry, especially in the winter, when they cannot get the worms they pick up in summer. Others, again, maintain that the habit of giving meat to poultry is productive of grave evils—the cause of many of the worst forms of disease which affect them. By these authorities it is called an unnatural food, inasmuch as the digestive organs of the birds are not fitted to assimilate it. There must, we think, be some mistake in all this; for we know of a surety that fowls do eat when they can

get it, and entirely of their own accord, an enormous quantity of animal food: here it is not cooked; the game found in nature's garden is raw. If meat is an unnatural food for poultry, they certainly have a most unnatural appetite for it. Throw in *one* lump of meat amongst a lot of fowls: if not literally a *bone* of contention, it is something vastly like it, so eager are all to get a grab at it.

(88) We believe the habit of giving much food in a short space of time to poultry is a very bad one. If you notice their habits you will perceive that the process of picking up their food under ordinary, or what we may call the natural condition, is a very slow one. Grain by grain does the meal get taken, and with the aggregate no small amount of sand, small pebbles, and the like, all of which passing into the crop assists digestion greatly. But in the "henwife's"—we by no means are personal in using this now celebrated distinctive appellation—mode of feeding poultry, a great heap is thrown down, and the birds allowed to "peg away" at such a rate that their crop is filled far too rapidly, and the process of assimilation is slow, painful, and incomplete. No wonder that so many cases of choked craw are met with under this treatment.

ANOTHER NEW MOWING MACHINE.

The working of a mowing machine on a novel construction, as recently invented by Messrs. Burgess and Key, of Newgate-street, was exhibited on Wednesday last, on two farms at Navestock, in Essex, on each of which one of the machines was in use upon grass. The first tried was on the farm of Mr. Daniel Hicks on a field fed with sheep in the early part of the season, previous to the rain-fall. The grass was very stout, there being at least $1\frac{1}{2}$ loads per acre; but it had been a good deal trampled on, and the "old fog" of the spring growth formed a *bottom* that would have given a scythesman the back-ache, and frequently taken the edge off his tool. The machine, however, cut it, and the track-board laid it in wind-rows, leaving the intervals clear for the horses to walk in. Throughout the crop was cut as close as a howling-green, not only on the level parts, but also in the hollows.

At Gilstead Hall, occupied by Mr. Adams, another machine of the same construction was at work on a second crop of grass, by no means heavy, and scarcely sufficiently so to stand well against the scythe. Any practitioner with that implement knows that it is liable to slip over a good deal of grass in such cases. The grass here when cut was laid into broad wind-rows, as in the other case; and the cleared ground had the appearance of a close-shaven lawn, with not a single blade uncut, or any inequalities on the surface.

Beyond cutting his own grass, Mr. Adams has cut some for his neighbours, his son working the machine, and whether cutting old meadow, or second-cut, or clover, the result in every case has been very satisfactory. He had always worked the machine with the same two horses, the average quantity cut being eight acres, and he had several times cut as much as ten acres in one day.

The peculiarities of construction in which this machine differs from those now in common use are these:—In all other mowers the crank is placed far above the level of the knife, so as to allow the cut-grass to pass under the connecting-rod. This involves an angular thrust on the knife, and great friction on the *slide* in which the knife works, resulting in great wear, and consequent liability to breakages and waste of power. It is in remedy

of this defect that the improvement is attempted. In this machine all the gearing which drives the knife is placed by the side of the wheel nearest the grass, and is so compactly arranged, that the tract cleared is sufficient for the gearing to run in. Thus, there being no grass in the way, the crank is brought into line with the knife, so as to give, through the connecting-rod, a straight thrust.

Altogether, this mower appears to have already established a good reputation in the prolonged tests to which the trial machines have been submitted. The knife-bar is, as nearly as possible, perpendicular in its position with the axle of the carriage, and consequently on a line with the lowest point of the periphery of the wheels. By this arrangement, there is no danger of the points striking into the ground, as the bar follows the inequalities of the surface with the wheels. The draught-bar is placed over the axle *nearest* to the off-wheel, by which the horse-power is applied exactly where it is most wanted on account of the resistance created by the working apparatus of the machine.

In a word, this machine has much to recommend it, whilst the manufacturers' friends speak very highly of its performances; but we must, of course, see it in competition before we can altogether endorse such a character.

SCRATCHES AND GREASE.—These ailments are scarcely known in well-ventilated stables, where cleanliness and care are exercised in managing horses' feet. J. B. Cheeseman sends his method of treatment, which is as follows: "Cleanse the heels with soap suds, and, when dry, apply hot tallow with a swab. One application is sufficient. Fish brine, or a coating of common white lead paint, are equally efficacious." We approve of your application of warm water and soap, and rubbing the parts dry, after which the white oxide of zinc ointment, or a little glycerine, will be found excellent applications for these diseases. They can be obtained of any good apothecary, are easily applied, and free from danger; which is not the case with the remedies you mention.—*American Agriculturist.*

THE FORMATION OF PERMANENT MEADOW AND PASTURE LAND.

In every province of the kingdom rich meadow and grazing grounds are to be found, and natural examples of this kind are not the worst practical rules for the guidance of the agriculturist in laying down arable lands to lie permanently in grass. In many cases it may not be an easy task thus to imitate Nature, but unless her counsels are complied with profitable results cannot be expected. A "fair face" may impose upon the simple, an exterior superficiality being but too frequently exemplified in the preparation of land for permanent meadow; but the laws of nature cannot thus be overruled, for the grasses have individually their own peculiar predilections. And this, too, is not all; for if you neglect to prepare the land for the grasses intended to be grown, the land will provide plants adapted to its special economy.

The principle upon which the alternate system of husbandry is based may practically be denominated one of manurial economy. It is the first principle that has to be attended to in the preparation of land and the selection of grasses for permanent meadow and pasturage; for, if a sacrifice is made in this respect, an annual loss must inevitably be sustained afterwards. Thus, in the case of arable husbandry, experience has taught the agriculturist to grow turnips and other green crops after corn, and *vice versa* corn after turnips and grass, so that for one application of manure he reaps a series of several different crops; but in the case of permanent grass, the different plants are grown together that are necessary to economise manurial elements so as to keep up the fertility of the land to its maximum. In many natural examples we have seen this illustrated in comparative perfection, the pasturage being as rich to-day as it was forty years ago, when we first knew it, the only other application of manure it has received during this time being the droppings of the cattle, the soil and the atmosphere supplying the plants with an abundance of food. But the vast majority of soils are deficient of certain elements, such as lime: and these have to be supplied in the form of manure. And, besides this negative defect, most soils also cannot procure from the atmosphere, including rain, dew, &c., the same amount of benefit as the exceptional few above, owing to differences of mechanical construction. They cannot even economise and use up the refuse vegetable matter which they possess; hence the reason why such accumulates in superfluous abundance of an effete character, doing harm in a two-fold manner—first by deteriorating the quality, and second by reducing the quantity of herbage annually produced.

The next thing that demands attention has reference to geological and geographical differences. The natural examples furnish an instructive lesson in both these respects, and they do so whether we examine the naturally rich soils that maintain their fertility, or the poor ones that yield only a stinted supply of coarse herbage; for between our northern and southern provinces, maritime and inland situations, and between low lying and elevated pastures, there is a wide difference in the individuality of the species of forage plants grown; and as it is in the natural example, so must it be in the artificial, both in the preparation of the land and in the selection of plants. No doubt a few of the grasses are common to every locality; but this fact has led to a very frequent error in exclusively selecting these for all permanent pastures; for in the natural examples they could not maintain their normal luxuriance without the economical co-operation of the other plants present, whose physiology is different, the latter being better adapted for one place than another, if not exclusively confined to one habitation. And even in the case of the common grasses referred to, they also differ widely in proportion and quality. Thus, the greater length of the summer day in the northern provinces affects materially their odorous and sapid properties as compared with the same species of grasses grown in the southern division of the kingdom.

Again, it will be found, on examining the natural examples, that each season has its own peculiar variety of plants in their prime as food for stock, and that these differ considerably according to the geological diversity of soil upon which they grow, including its elevation, exposure, &c. Indeed, the family of forage plants consumed by cattle may be pronounced infinite as to variety in every individual case, so prolific is Nature in supplying our live stock with the daily necessities of life. Not a few of these plants are under-estimated, at the

present time, as to their dietetic value, being considered as weeds that ought to be extirpated; and doubtless a considerable number of them are actually such, being opposed to the general welfare and economy of the dietetic class as a whole; consequently the greater this number the less perfect is the natural example, when taken as a rule, and the higher the degree of skill necessary on the part of the farmer in the performance of the work. Weeds of this kind form an interesting index to the quality of the soil, its manurial, climate, and elevation, and require the exercise of much judgment to understand practically the lesson which Nature thus gives the agriculturist for his guidance. The land to be laid down to grass will, for the most part, furnish a negative example, as a rule; the vast majority of arable soils producing weeds that ought to be avoided in pastures—weeds that will cease to grow when the land is properly cultivated and manured. And it is only when land is brought into such a state that it can with any prospect of success be laid down to permanent grass.

This negative rule merits a special notice. There are but few intelligent farmers who are not practically familiar with it; for they know from experience when the land is in a condition that is likely to throw up a redundant crop of weeds, and when it promises a plentiful return of corn. It involves also several cardinal conditions—first, that land should never be laid down in a bad season, to lie permanently in pasture; secondly, that the work of preparing the land must be effectually concluded prior to sowing the seeds; and, thirdly, it follows as a corollary to the last, that all book-rules must be excluded, with, perhaps, the exception of those of the most generalizing character.

From these cursory observations it will readily be seen that in laying-down land successfully to grass the agriculturist must be thoroughly master of his profession, both as to the nature of the soil and the physiology of the grasses, using the latter phrase in its widest meaning. It is equally clear that those who are thus qualified will not recommend the laying down of poor clays, because they cannot be profitably farmed under arable husbandry; for before arable land can be successfully converted into rich grazing ground, it must be in the most profitable condition for yielding corn and other cultivated crops.

MALT.—The quantity of malt charged with duty in England and Wales in the six months ending June 30th this year was 26,773,748 bushels, as compared with 27,208,425 bushels in 1864, and 24,597,161 bushels in 1863 (corresponding periods). The quantity of malt made free of duty for distillation and export in the half-year ending June 30th was 403,596 bushels, against 393,169 bushels in 1864, and 405,456 bushels in 1863 (corresponding periods). The quantity of malt charged with duty in Scotland to June 30th this year was 1,299,917 bushels, as compared with 1,107,543 bushels in 1864, and 1,139,189 bushels in 1863 (corresponding periods). The quantity made free of duty for distillation and export was 2,105,598 bushels, against 2,230,824 bushels in 1864, and 2,117,153 bushels in 1863 (corresponding periods). The quantity of malt charged with duty in Ireland to June 30th this year was 1,411,789 bushels against 1,487,086 bushels in 1864, and 1,238,356 bushels in 1863 (corresponding periods). The quantity of malt made free of duty for distillation and export in Ireland to June 30th this year was 432,862 bushels, against 372,161 bushels in 1864, and 312,137 bushels in 1863 (corresponding periods). Taking a general view of the whole United Kingdom, we thus find that the quantity of malt charged with duty to June 30th this year, in England, Wales, Scotland, and Ireland, was 29,485,454 bushels, against 29,803,054 bushels in 1864 and 26,974,706 bushels in 1863 (corresponding periods). The quantity made free of duty for distillation and export in England, Wales, Scotland, and Ireland was 2,942,056 bushels, against 2,996,154 bushels in 1864, and 2,834,746 bushels in 1863 (corresponding periods). The total production of malt in the United Kingdom to June 30th this year was thus 32,427,510 bushels, as compared with 32,799,208 bushels in the corresponding period of 1864, and 29,809,452 bushels in the corresponding period of 1863. The quantity of malt retained for home consumption to June 30th this year was 31,275,299 bushels, against 31,867,402 bushels in the corresponding period of 1864, and 29,032,254 bushels in the corresponding

period of 1863. The quantity exported to foreign countries on drawback and free of duty was thus 1,152,211 bushels to June 30th this year, as compared with 931,806 bushels in the corresponding period of 1864, and 777,198 bushels in the corresponding period of 1863. The production and consumption of malt are accordingly shown to have slightly decreased this year.

DISEASES OF THE EYES IN HORSES.

INJURIES OF THE EYELIDS AND CORNEA, COLD IN THE EYE, &c.

The eyes of men are often subjected to straining, overwork, and long late hours; their diseases, therefore, are more numerous and serious than those of the lower animals.

The eyelids, especially in horses, are apt to be torn from bites, or from being caught by hooks or nails situated about the stable or on the harness. The loose portions, which are often ignorantly clipped off, should if possible be carefully preserved, brought into position, and there retained by a few pins or stitches. In the slighter cases any undue inflammation may be prevented by keeping the parts frequently wetted with cold water, or with any simple cooling lotion, such as an ounce each of sugar of lead and vinegar dissolved in a quart of water. Where adjoining parts are hot, tender, swollen, or much bruised, warm fomentations will for a day or two be preferable to the immediate application of cold. When such accidents occur in horses, it is usually advisable for a day or two to tie up the animal's head, to prevent his rubbing out the pins or stitches, or displacing the necessary applications.

The lower lid sometimes gets inverted, constituting trichiasis—a complaint greatly more common in dogs and cattle than in horses. The removing of a few of the eyelashes from the offending lid affords temporary relief; but as the hairs soon grow the evil is apt again to return, and the only radical cure is to remove with the scissors a small portion of the loose skin, and keep the cut surfaces together with one or two stitches. Tumours and warts occasionally appear about the eyelids or on the caruncle, where they interfere with the flow of tears. They must be removed much in the same manner as when occurring elsewhere. The lachrymal duct, provided for the passage of the tears from the inner corner of the eye to the nostril, occasionally becomes impervious from thickening of its lining coat, from tumours, or from fistula. By the use of a whalebone bougie, and by frequent syringing, Mr. Percival has cleared the tube for the passage of the tears.

Lining the eyelids, and reflected over the eye-ball, is a mucous membrane—the conjunctiva. During colds, sore throats, and other irritable states of the contiguous membrane lining the air passages during teething, and after exposure to cold easterly winds, the conjunctiva is apt to be irritable and suffused with an over abundance of tears. In all animals portions of chaff, hay-seeds, sand, and other foreign bodies are apt to become attached to this moist delicate membrane, causing irritation, the outpouring of tears, and closure of the lids. When the animal is secured, and the lids held open, the corner of a handkerchief will usually readily wipe away the offending body. Occasionally, however, it becomes after a time so embedded in the membrane that it cannot easily be removed without the aid of a delicate pair of forceps.

COLD IN THE EYE, OR SIMPLE OPHTHALMIA.

From the continued irritation set up by some foreign body from the stroke of a whiplash, or more frequently from exposure to cold, the mucous surfaces of the eye and eyelids become inflamed, constituting conjunctivitis, conjunctival or simple ophthalmia, popularly known as a cold or blight in the eye. The membrane, which is naturally smooth and glistening, now looks dry, swollen, and roughened; its vessels, which in health are minute and scarcely visible, are now scarlet, dilated, and tortuous, forming an irregular red network, of which some of the meshes are entirely filled up with extravasated blood. This reddened network and outpoured blood are perfectly superficial, and can even be moved about over the subjacent surfaces—a point which indicates the absence of the more serious deep-seated inflammation, known as specific inflammation. The eye is rather impatient of light: the tears, which in the early stages are abundant, give place to a discharge of yellow thickened mucus mixed with pus, which

sticks to the angles of the swollen lids, glueing them together. That portion of the membrane lining the eyelids is usually first and worst affected, and especially in those most frequent cases where the inflammation, beginning with common cold in the head, gradually extends itself until it reaches the adjacent conjunctiva. The treatment of this complaint is seldom difficult. The patient should be protected from inclement weather, receive a dose of purgative medicine, live for a few days on light unstimulating food, and have a stimulating lotion applied twice or thrice daily between the eyelids. For this purpose nothing answers better than a lotion containing four grains of nitrate of silver to the ounce of water.

INJURIES OF THE CORNEA.

The instant involuntary closure of the eyelids on the approach of a blow, or such other cause of injury, protects the cornea from frequent injury. Occasionally, however, ulcers appear upon it. These are most common in dogs during or after serious and protracted cases of distemper. The general health, which in such cases is indifferent, must be promoted by generous diet, and tonic medicines, and the parts moistened daily with a solution containing five grains of nitrate of silver to the ounce of water. To cause the contraction of the iris, which in bad cases is exposed, and to abate irritation, the eye should likewise be moistened several times daily with a diluted solution of the tincture of the Calabar bean.

From the healing of ulcers from inflammation, from injury by a whip-lash, or from other such causes, specks of lymph are sometimes deposited in the structure of the cornea. Sometimes they are so slight as to be discernible only after careful examination, and are then of little moment. Sometimes they leave considerable opacity, interfere with vision, and in horses constitute unsoundness. They are perfectly distinct from cataracts, being much nearer to the surface of the eye. When recent, they are usually readily enough removed by the use of a solution of nitrate of silver, or other such stimulant.

WORM IN THE EYE.

In India during the cold season from October to February, and especially during a wet year, worms are often found in the eyes of horses. They are white, measure from one-fourth to three-eighths of an inch in length, and are about the thickness of medium-sized sewing thread. One and sometimes two may be seen swimming about in the aqueous humour. After one worm has been removed, a second will sometimes appear within a fortnight. In a germinal state they are probably swallowed with the water drunk, thus find access to the blood, and are thence deposited in the aqueous humour. They cause considerable irritation, weeping eyes, and opacity of the cornea. Occasionally they are spontaneously absorbed; but it is unnecessary to wait for this, and when they cause annoyance they should be removed by opening the chamber with a sharp lancet about a line from the junction of the cornea with the sclerotic; the eyeball the while is pressed upon, the aqueous humour escapes, and with it the parasite. The horse for some days should be protected from strong sun light and cold rains; the humour in a few weeks is reproduced, and even the mark of the puncture disappears.—*North British Agriculturist.*

WATERFORD FARMING SOCIETY'S ANNUAL SHOW.

On Tuesday, Sept. 12, the Waterford Farming Society held its eleventh annual show. The show of shorthorns was a capital one, as may be observed when we state that Mr. Welsted, of Ballywalter: Mr. Anderson, Grace Dieu; Mr. Jones, Mullinadro; Sir Robert Paul, Ballyglan; Mr. Malcolhson, Milford; Mr. Bloomfield, Newpark; and Mr. Joyce, of Abbey Farm, with their crack winning animals, were the principal exhibitors. Of the prize cups, the first was the Marquis of Waterford's 50-guinea cup, to be competed for by the best two-year-old shorthorn heifers, and open to the world; in this section the great contest lay between Mr. Welsted's Elfin Rose, his Rosette, and Mr. Anderson's Game Hen 2nd, his Rosalie, and Rose of Erin. On the present occasion, the judges restored Mr. Welsted's heifer Rosette to the position she obtained at the Cork show. The next cup was that presented by the late Captain Ball, value £10, for the best shorthorn heifer calf, bred by the exhibitor, Mr. Anderson taking it with Octavia 3rd, Mr. Bloomfield coming in second for Medora. In

the gentlemen's class, there were two very superior yearling bulls exhibited, Mr. Jones taking the first place for Lord Nelson from the Westland herd, and the second to Mr. Anderson's Lord of Rocklands. In aged bulls there were but two. Mr. Malcolmson's Field Marshal 2nd took the prize. In aged cows, Mr. Anderson took the lead with Dandelion. In three-year-

old heifers, Mr. Jones got first, and the cup for the best female in the yard for Lady Spencer. In yearling heifers, Mr. Anderson was first with Game Hen 2nd. The show of farmers' horned stock was good. The show of sheep was little more than an excuse for one, though there were a few good rams; and pigs were excellent.

FROM NORFOLK TO NORTH LINCOLNSHIRE.

Now that we have had three weeks of as dry and hot weather as have occurred for a long time at this season, it would be futile to dwell on the remnant of the harvest in the counties in question as it presented itself ten days or a fortnight ago, for it has now undoubtedly been secured in fine order. But there are many points of general interest at this season, which present themselves to the eye and ear as one passes through counties, and from one county to another, and mingles with parties of men who have a direct interest in current agricultural events. In reference to the corn crops in Norfolk, it may be said the more extensively and closely they were inspected and inquired into the less favourable they appeared. Happily there are many wheat stacks and some barley stacks of the fine crops of last year in the hands of the large farmers to fall back upon; but beyond this comfort their size and condition act to make clear by contrast the poverty of the present yield. The new stacks by the side of the old ones look only half-grown, and the swarthy or muddily complexion of the new ones sufficiently indicates the inferiority of the quality. The bright thatel, in places where the straw has been well kept, makes the body of the stack look as though it were clothed in sack-cloth. The anxiety arising from this state of things, coming as it does upon past difficulties, caused many thoughtful and reasoning men to express serious misgivings in regard to the consequences to many farmers, who have expenses to meet, and to consumers of meat, who have families to sustain.

This anxiety is far from being groundless; indeed, in our opinion, it is well founded, as it but harmonizes with views which we have frequently expressed for many months past. It is the bulk of farmers who will be seriously affected by the lightness of the harvest, the badness of its quality, and, in many cases, its unmarketable condition. The men who are holders of old wheat are the exceptions, who have had the advantages of breeding-farms, and have therefore profited comparatively from the high prices of lambs and store sheep, or otherwise they have something else besides farming to trust to, or their family expenses are much beneath the average. In all businesses there are these exceptions, and it would be hard if agriculture in these respects stood alone. But after the low prices we have had, and the awkwardness of the banking accounts of middle as well as little men, how is it possible they can realize by their present crops an adequate amount of capital to enable them to fill their yards and folds with store oxen and sheep at present prices? We have repeatedly said that agriculture, like other branches of the nation's business, must settle down to a question of capital and legitimate profits on capital employed. Farmers cannot keep on borrowing or hiring capital over and over again, after losing it piecemeal; nor after a course of oppressive and hard times can they go to wholesale houses and get credit for stock that they want for six or nine months till they can make a return of turnips, swedes, mangold, and inferior corn, which they now require to be turned into meat. With respect to the eastern counties, and similar districts, as regards importers of store stock, it is merely looking the broad question in the face to ask—what is to be done? With two-year-old oxen at £12 to £15 each, and lambs between 30s. and 50s. each, it will take from two to three acres of wheat or barley to buy one ox, and only from two to three lambs can be bought with the proceeds of an acre of either of the same staple crops. This is the way to bring the agricultural situation to its true bearing. This is the only way, too, it seems by which "farmers' friends" can be brought to judgment—by which we mean sound understanding. This, too, it also seems, is more than ever necessary; for, from all that we can now see, by what is going on around us, farmers have more cause than ever to exclaim, "Spare us from our friends!"

Viewing these matters upon these broad grounds, it is perfectly clear that the contempt in which agriculturists have been held for many years is steadily, but surely, resulting in most disastrous consequences, not only to them as a body, but to the whole community. This is not mere superficial croaking, nor is it a mere attempt to turn the tables on men who have abused British farmers and everything belonging to them, and the way they have done their business; but it is the result of looking at the signs of the times with a farmer's eye, and it is a deliberate expression of an opinion based on the information we have been able, under these advantages, to obtain. Citizens, in their simplicity as regards agricultural matters, are under the impression that farmers are making a good thing out of the present high prices of stock and meat; but it is only by the favourably situated breeding-farmers that an extra profit is being made; for farmers, who have to depend greatly on their corn for the higher rents of the good land they hold, are only able to make an ordinary return by setting the higher price of the stock they rear and fatten against the low prices of wheat and barley, while the bulk of farmers are positively worse off under the present scarcity of cattle and sheep, than they would be if animals were one-half more plentiful—reckoning by ages—and meat was one-fourth lower in price.

The "discerning British public" cannot understand that farmers, under the difficulties in which they have periodically been placed during the last twenty-five years, have necessarily sold off their cattle at times half-grown and half-fat to meet their unavoidable expenses. This, however, is so far true that three-year-old oxen grow scarcer and scarcer, till there is almost every appearance of animals of this age being novelties in fairs and markets, while two-year-old sheep are very few and far between. Nor can the "discerning British public" believe that this sudden scarcity of meat is owing to any other cause than "increased consumption from the prosperity of the country," the drought of last autumn, and the "rinderpest!" The "discerning British public" say supplies do not fall off, and the cattle-market returns are quoted in the daily papers to prove it; but the facts (1) that the facilities for transporting cattle by railway cause many extra cattle to be sent to London to exchange hands for eastern, northern, western, or southern consumption, according as the seasons for grass and turnips may turn, and (2) that often half and sometimes two-thirds of the foreign cattle are stores merely taken to this centre to meet the Kent, Herts, and Eastern Counties dealers—these facts are either ignorantly or wilfully withheld by journalists of a particular "bias," and the "discerning British public," who accept their conclusions, do not go to the Metropolitan Market to see for themselves; by which we allow that—and this is going a great way—a metropolitan citizen would be able to tell one from the other when he got there. So late in the last autumn store-stock season as the great Christmas market day, in the middle of December, was this the case, the stores among the foreign cattle being more numerous than the killable ones. This was because, as we have before said, the trade in foreign stores was greater last autumn than it ever was before. How, we again ask, can these facts, in the face of few roots and no hay for store cattle, be disposed of by the theorists who contend there has been no falling off in home supplies?

The only recommendation we can give to "farmers' friends" in this dilemma is to do all that can be done to make capital easy. It is the height of folly to attempt to patch up things as they now stand, by talking about the sciences, increased and improved machinery, and such like matters. Farmers want more breeding and store cattle, and that freedom of action, which will admit of their production, and, when produced, of their being held till they have grown to good size and weight.

Whether it be landlords whose rents are coming due, or bankers who can supply the "sinews of production," it is of the greatest importance that matters should be made as easy as possible—by the former by postponing rent audits as long as possible, and by the latter by being as liberal as possible in overdrawing and discounting when the same can be done with due appearances of safety. There is plenty of floating capital in the country. The nation never before so much needed that this floating capital should be as much as possible diverted into the hands of respectable and skilful, but of late years scandalized, agriculturists.

To farmers we would say, in the midst of this national dilemma, take matters—public matters—quite easy. When calm and respectful complaints have been made during the last quarter of a century, the counter-cry has been—"You farmers are always grumbling!" After you have done your business as well as you can, under the difficulties which surround you, you may rest on your oars, and allow the "discerning British public" to do the grumbling! After 25 years' persecution, it will be your turn shortly to be courted, consulted, and believed. The "discerning British public," when it has been brought to its senses by a course of facts which pertain to the pocket and

stomach, will displace their past errors and enmity, by a just appreciation of English agriculture, and offering the hand of friendship to the British farmer! What form these points are likely to take we have not space here to discuss; but with "strikes" on the plea of "high rents and dear meat," there are ample texts; for manufacturers are now as much perplexed as to the way they can compete with foreign nations, as farmers have been during the late hay and corn harvest, on account of the scarcity and high price of labour.

Passing on from Norwich, by Thetford, Brandon, and the Isle of Ely, to Peterborough, similar appearances as regards the corn crops and the abundance of feed for stock generally presented themselves. Mangolds everywhere are extraordinary. The main point of interest centred in the swede crop, about which we said something from Norfolk a fortnight since. The appearances throughout all the distance we went but confirm our views then given. Now is the time to discuss these points, that comparison may be made, and notes taken for filling in diaries for reference next sowing time.

It is gratifying to be able to say, not a single case of the cattle fever has been reported as having occurred in Lincolnshire. W. W. G.

AGRICULTURAL STATISTICS, IRELAND, 1865.

Mr. Donnelly, the Registrar-General, has forwarded us the return of the crops grown in Ireland for the past year and the preceding, from which we make the following extracts:—
The total acreage under all crops this year was 5,645,103 acres. The do. do. in 1864 was (revised numbers) 5,676,321 "

Showing a decrease in the total extent under crops in 1865 of 28,218 "			
The crops which diminished in extent were—			
		Decrease.	
		Acres.	Acres.
Cereals	{ Wheat	8,410	79,035
	{ Oats	70,625	
Green Crops	{ Turnips	3,404	4,057
	{ Vetches and rape	633	
Flax			50,159

Decrease 133,251			
The crops which increased in extent were—			
		Increase.	
		Acres.	Acres.
Cereals	{ Barley	4,507	6,585
	{ Bere and rye	1,238	
	{ Beans and peas	849	
Green Crops	{ Potatoes	26,170	29,478
	{ Mangal and beet	301	
	{ Cabbage	1,691	
	{ Carrots, parsnips, and other green crops	1,316	
Meadow and clover			68,970

Increase 105,033
Although the foregoing statement shows a decrease of 28,218 acres in the total area under crops in 1865, there was an increase in the extent under grass to the amount of 127,470 acres, the area under "bog and waste unoccupied" having diminished by 101,543 acres.

The following abstracts exhibit the acreage under each crop in 1864 and 1865, and the increase or decrease in the latter year :

ABSTRACT OF CEREAL CROPS.				
	1864.	1865.	Increase in 1865.	Decrease in 1865.
	Acres.	Acres.	Acres.	Acres.
Wheat	276,483	268,073	—	8,410
Oats	1,814,886	1,744,261	—	70,625
Barley	172,700	177,207	4,507	—
Bere and rye	8,894	10,132	1,238	—
Beans and peas	16,090	16,930	840	—
Total	2,280,053	2,216,603	6,585	79,035
Decrease in cereal crops in 1865			72,450 acres.	

ABSTRACT OF GREEN CROPS.

	1864.	1865.	Increase in 1865.	Decrease in 1865.
	Acres.	Acres.	Acres.	Acres.
Potatoes	1,039,724	1,065,894	26,170	—
Turnips	337,355	333,951	—	3,404
Mangal wurzel } Beet root	14,128	14,429	301	—
Cabbage	31,821	33,512	1,691	—
Carrots				
Parsnips				
Other grn. crops } Vetches & rape	23,149	24,465	1,316	—
	29,829	29,176	—	653
Total	1,476,906	1,501,427	24,478	4,057
Increase in green crops in 1865			25,421 acres.	

GENERAL SUMMARY.

Decrease in cereal crops in 1865	72,450	132,609
Do. flax in do.	50,159	
Increase in green crops in do.	25,421	94,291
Do. meadow and clover in do.	68,970	

Total decrease in the extent of land under crops in '65 28,218

He further states that the returns of live stock for 1865 compared with 1864, show an increase in the number of cattle of 231,120; of sheep, 321,801; and of pigs, 211,413; and a decrease in horses of 14,201.

The total estimated value of horses, cattle, sheep, and pigs this year was £32,772,609, being an increase of £2,043,699 compared with 1864.

It is very satisfactory to observe the continued care bestowed on the rearing of young stock throughout the country, as appears by the returns of this year, which exhibit an increase in the number of cattle, sheep, and pigs, under one year old, in each of the provinces, and almost in every county, the total increase of cattle under that age being 56,147; of sheep, 175,441; and of pigs, 220,285.

IRISH EMIGRATION.—In the first seven months of 1865 the returns of emigrants obtained at the several ports of Ireland by the enumerators show that 62,262 persons left this country, stating it to be their intention not to return. In 1864 the number for the same period was 84,586, being in this year a decrease of 22,324.

THE LABOURERS' PRIZE LIST.

"The vigorous and flourishing society" at Kingscote held its meeting, a celebration more especially devoted to the advancement of the labourer. As will be found from the report with which we have been favoured, see page 314, there are prizes for ploughmen, for shepherds, and for good service—all very admirable incentives, whatever the Member or the Mayor of Bedford may say to the contrary. But the Kingscote Association goes rather further than this. For a local institution it is somewhat ambitious. There are periodical discussion-meetings when the moon is up; Mr. Morton is going to give a lecture on education, and a chemistry class has been established; while the mental and moral condition of country servants is to be improved in this wise: "To the agricultural labourer or female servant for the best account of the life and times of Daniel the prophet, with practical reflections thereon, £2"; with another premium, for "the agricultural labourer or female servant under eighteen years of age, for the best exposition of 'Who was Gideon, and what were the means used to impress the power of God on the minds of men through him?' with practical reflections thereon." As is well known, we have long advocated the advantages of encouraging, by the agency of public rewards, proficiency in skilled labour, respectability of conduct, and length of service. We would go even occasionally as far as they do in France, and make the merit of a good servant a matter of general congratulation. But it is quite possible to push such a system to the verge of absurdity; and if we laugh at the notion of a housemaid stipulating for her evening out to attend a singing class, or a nursemaid insisting upon her French lesson, we can scarcely do less at the idea of setting down a ploughman to pen a prize essay, or inciting a dairy-woman to prepare a theological discourse. The practical reflections upon the mission of Gideon certainly fell through, for there was no competition; but Timothy Leonard, in the service of Colonel Kingscote, gained the premium for his *Life of Daniel*—a yet more successful author, Mr. Fawkes, being disqualified, from having previously distinguished himself in this way. We seriously doubt the good that can follow from the adoption of such a course as this, which would promise the rather to turn a good workman into a mere "fiddler," who, with his head upset, would be thinking a deal more of his pen and ink than his proper vocation. In truth, the chances are that the successful essayist would soon forsake the plough-tail for the pursuits of literature; and those who know anything of a country life can imagine no more miserable lot than that of the half-educated pauper-poet or scribe, who has abandoned his proper position and vocation, mainly through the mistaken kindness of friends and patrons. And such mistaken kindness, as we take it, characterizes the proceedings of the Committee of the Kingscote Agricultural Association, when they prompt ploughmen and maids of all-work to bother their brains over theological arguments, by way of relief to their more

"practical" employment. Such items in the prize-sheet naturally enough are provocative of attack, and *The Saturday Review* pens one of its bitterest diatribes against the Kingscote philanthropists, as in this wise: "Poor Hodge of the fields! He is even worse off than his luckless brother in the towns. The artisan of the town is invited to spend his leisure hours in making a set of tea-things out of nut-shells, or in rigging little toy-boats; and he is dragged off to look at the tea-things and toy-boats which his friends have made. This is hard, certainly; but it is a great deal harder fate to be bullied by the benevolent master, and the patronizing parson, and the gushing Lady Bountiful, into writing a theological or moral essay. The dairymaid no sooner gets the butter and the cheeses out of the way, and her male companion no sooner gets the ewes and the lambs and the roots and the dung off his mind, than he and she are asked to grasp pens, and write theological disquisitions, one against the other. It is true that the man's valuable essay may bring him in a couple of pounds; while sporting with Amaryllis or Næra in the shade might possibly cost him six pounds ten shillings per annum." Or, again: "The common notion among sensible persons is, that, after a spell of hard work, it is good to let the mind lie fallow awhile. Among the kind friends of the working-man, however, there seems to be some confusion between leaving land fallow and deluging it with liquid manure. They think that the mind is refreshed by the production or contemplation of sheer rubbish—the mind, that is to say, of the 'son of toil,' as they call a man who works for daily or weekly wages. Their own minds, it would seem, don't need the renovating process. Timothy Leonard's master would, no doubt, use very strong language if anybody pestered him to improve his mind in his leisure hours by writing an essay on the life and times of Daniel or Jerubbaal; only he would most likely not have the faintest notion who Jerubbaal was; and his ideas of Daniel even would probably be confined to something about a den of lions. Why does not somebody found prizes for 'improving the mental and moral condition' of the landed gentry, and the rich manufacturers, and the country clergy? If the Kingscote Agricultural Association would do us the honour to accept any suggestion of ours, we would respectfully submit that next year their subject might be, '*The Life and Times of Balaam, with practical reflections on the part played by Asses in the world.*'"

This is plain speaking, but the Kingscote Association has only asked for all it has got. One word more: There is no so sure a way to make a man a humbug as to encourage him to trade upon religion; and if these Gloucestershire essayists take to roadside ranting, or any other plan of shirking hard work, it is no more than their patron Society has a right to expect. The good old rule was that the best servants could neither read nor write; but there is a medium in all things, and even education need not be pushed beyond its proper use and purpose.

CALENDAR OF AGRICULTURE.

This month generally concludes the harvest. The ricks are immediately thatched to secure the grain from damage: the covering must be in readiness for the purpose. Beans will be the latest crop: tie with straw ropes into sheaves when cut by hand-sickle, or with tarred twine, which may be preserved for many years. Beans and peas require immediate thatching, as leguminous plants imbibe and hold much moisture.

Finish the dunging of clay fallows; cart stones and tiles to drains; scour ditches; repair, widen, and straighten brooks and rivulets, and mix the excavated earths with lime for composts. Lay well-prepared composts on grass lands eaten bare, and on lucerne, the surface being first scarified, and then roll it. This preparation varies the first spring crop.

Sow winter vetches on good lands, and on partial fallows with dung—mix with beans or winter barley.

Plough the stubbles for next year's green crop fallows, and work the lands if the season be favourable; the dung may also be applied: which preparations will much further the spring operations, and are very advantageous.

Seed-furrow clay fallows, and sow wheat. Plough grass leys for the same purpose, and press and sow quickly. Scuffle pea and bean store graffans, collect and burn all weeds, and lay on dung. Sow wheat on one furrow of ploughing.

Rick hops—the flowers are put into bins, being first cut from the stems by scissors, and are paid for by fixed rate, then carried to the oast and dried, chiefly with coke: some use sulphur to give the hops a yellow tinge. The haulm of the hops is a good bitter. Place the poles in a conical erection, and cover them for next year. Keep all the live stock in good condition, and the farm horses for the autumnal operations.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Mushroom beds are now prepared, and produced naturally in showery weather.

Lettuce may be sown early for winter, and as soon as fit for transplantation ought to be pricked out into a roomy frame, where the plants will prosper and stand the winter. Some of the heavier sorts may perhaps endure the open air, but the frost destroys the most general kinds.

Cabbages for spring. Plant the main stock in an open situation—soil rich with manure, unless it be a new loam. All the cabbages thrive amazingly in fresh soils and earths, and much better than in old garden soils, though richly manured.

Spinach: The plants raised from seed should be thinned out to regular distances of two or three inches; the plants will then become stocky, and may be thinned again, and the plants so removed are used for the table.

Turnips: Thin out and hoe the spaces between the rows, for they should always be sown in drills. Sow salads again if required.

Routine: Exterminate every weed, and bring every plot to that state of neatness and order which renders a garden a sober quiet picture during winter, more beautiful perhaps than that of a rampant luxuriance in summer.

FRUIT DEPARTMENT.

Plant strawberry beds and rows with well-rooted young plants, which will rarely fail—young stock provided in pots are well transplanted with entire balls. Place nets in front of any wall trees, to catch the falling fruit. If wasps abound, suspend bottles half filled with treacle water among the branches: thus thousands may be destroyed.

FLOWER GARDEN.

Finish the clipping of box edgings; remove greenhouse plants to their winter quarters; transplant pinks raised from pipings, and also some hardy herbaceous plants. Then rough-dig or fork all the vacant parts of borders. Weed and roll gravel walks when they are in a damp state.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR SEPTEMBER.

The continuance of remarkably fine weather has been of immense service to the farmers in the north of England, as well as in Ireland and Scotland. Rapid progress has been made in securing the crops; so rapid, indeed, that at this time the fields are almost wholly cleared. For the time of year the temperature has been unusually high, and very little rain has fallen in any quarter. The pastures have, therefore, suffered somewhat; but, on the other hand, the root crops have derived great benefit from the remarkably fine weather. It may be observed, however, that turnips, owing to the ravages of the fly, have been a partial failure, especially in the midland and southern counties. The swedes and mangolds are by far the largest crops ever grown in this country.

Rather a large quantity of new wheat has been thrashed out and disposed of. In the quality of the samples we have noticed a great improvement compared with the previous month, and it is evident that the heavy rains in August inflicted less damage upon the crop than was at one time anticipated. We calculate the total growth as a fair average one; yet our impression is that really fine samples will command steady currencies for some time. The great falling off in the shipments of both wheat and flour from America will, no doubt, have some influence upon prices here; still, no doubt exists that we shall be in a position to meet the wants of millers, at very moderate prices. There is still a fair quantity of old wheat in stack in most of our leading districts.

The growth of barley is nearly, or quite an average; but the quality of the samples will not, we think, come up to last year. Malting parcels are therefore likely to command good prices during the whole of the malting season. Nearly the whole of last year's barleys have been consumed.

There has been a very large business doing in oats, at full prices. The imports from abroad have been extensive, but in poor condition. Both beans and peas have commanded very little attention, and the quotations have had a drooping tendency. The supplies on offer have been very moderate. The flour trade has been moderately active, and prices have been well supported. The supply of foreign on offer has been very limited. In the south of France, the crops have been all carried, and, in the northern departments, very little produce remains in the fields. In the north of Europe, harvest-work will be shortly brought to a close. The wheat crop is not quiet equal to 1864; but the growth of Spring corn is somewhat in excess of that year. American advices state that large supplies of food have been forwarded from the Western to the Southern States to prevent starvation amongst the people. Prices at the various shipping ports are, therefore, too high to admit of profitable shipment to England.

Hop-picking has gone on rapidly. The growth of hops is certainly very large, but the colour of some of the samples is complained of. The business doing has been very moderate, at from 90s. to 160s. per cwt. New hops have already arrived from Germany in good condition, and somewhat large shipments will shortly be made from the United States, where the crop is a full average.

Cotton having further advanced in price, with an excited market, the bulk of the colonial wool offered at public sale was disposed of at steady currencies. The high prices ruling for woollens in America have led to large exports of goods, and to the receipt of numerous orders from the States. There is, therefore, every prospect of a good demand for wool for several months. The stock of colonial wool now in London for the November sales is about 33,000 bales.

As to quantity the potato-crop is unquestionably the largest ever grown. We find, however, that a portion of it is turning out badly, selected qualities have therefore advanced to 110s. per ton, but really inferior kinds have changed hands as low as 25s. to 30s. per ton. Very few foreign potatoes have been reported, yet our opinion is that our market will be amply supplied with good sound qualities during the winter.

Both hay and straw have changed hands slowly, but at good prices. Meadow hay has realized £1 5s. to £6, clover £5 to £7, and straw £1 8s. to £2 per load.

The Scotch markets have been very scantily supplied with wheat, in which very little business has been passing on rather lower terms. The new crop is certainly an average one. Barley and oats have met a slow sale at about previous rates.

In Ireland wheat has moved off slowly on rather lower terms. Barley and all other articles have realized extreme rates. The shipments of produce have been on a very moderate scale.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Most of the markets held during the month have been seasonably well supplied with beasts, as to number; but their general quality has not improved. Prime breeds have consequently sold freely at enhanced quotations, but inferior stock has moved off heavily on rather lower terms.

The supplies of sheep have been tolerably good, and most breeds have shown a great deficiency in weight and quality. Downs, half-breeds, Leicesters, and Lincolns have met an active inquiry at high currencies. Inferior foreign sheep have been a mere drag; good prices have, however, been realized for them.

There has been a good consumptive inquiry for calves at enhanced quotations. The imports of foreign calves have been seasonably extensive.

Very high prices have been obtained for pigs, notwithstanding that the numbers on offer have been equal to most previous seasons.

Altogether the cattle trade has been in an excited state. The spread of disease amongst both beasts and sheep, and more especially amongst the cows in the London dairies, has created a great amount of alarm amongst the consuming classes, whilst the deficient condition in which much of the stock has made its appearance has led to long prices for superior animals. Apparently, however, the quotations have seen their highest range for the present, because it is evident that the consumption of meat is rapidly falling off, owing to the inability of the lower classes to purchase, and because the use of meat in other quarters is much restricted.

Fortunately for the country, there is an ample supply of food on hand for winter consumption. It will materially assist both graziers and flockmasters, and prevent an immense outlay of capital for cake and linseed. The disease may therefore shortly be arrested, especially as we are now nearly free from excessive heat.

The imports of foreign stock into London have been as follows:—

	HEAD.
Beasts	12,553
Sheep	67,640
Lambs	2,151
Calves	3,192
Pigs	9,434
Total	94,970

COMPARISON OF IMPORTS.

	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1864	14,444	45,760	2,441	3,161	5,701
1863	11,923	48,021	2,759	3,213	2,691
1862	7,219	32,154	1,830	2,257	2,546
1861	6,759	34,870	1,366	2,323	3,214
1860	8,129	36,381	1,039	2,200	3,185
1859	6,966	37,783	1,358	1,744	1,895
1858	5,999	35,488	717	2,735	2,472
1857	7,346	21,090	198	1,953	2,067
1856	7,084	20,695	3,000	2,772	1,559
1855	7,161	22,744	613	1,616	2,266

The total supplies of stock exhibited in the Great Metropolitan Market have been:—

	HEAD.
Beasts	27,040
Cows	530
Sheep	151,440
Calves	3,324
Pigs	3,287

COMPARISON OF SUPPLIES.

	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1861	39,940	560	137,490	3,184	3,790
1863	27,710	531	131,100	2,458	2,657
1862	28,074	526	139,270	2,361	3,031
1861	26,950	520	142,990	2,260	3,626
1860	27,080	509	144,450	3,309	2,922
1859	24,560	514	145,430	1,891	2,771
1858	27,446	533	131,150	3,210	1,281
1857	25,734	531	117,715	2,220	2,585
1856	24,002	485	132,014	2,452	2,800
1855	21,667	549	152,120	2,477	3,921

The arrivals of beasts from our own grazing districts, as well as from Ireland and Scotland, thus compare with the two previous years:—

	Sept., 1865.	1864.	1863.
From Lincolnshire, Leicester-shire, & Northamptonshire ...	8,000	12,500	10,700
Other parts of England ...	2,500	4,000	2,300
Scotland	135	1,362	1,820
Ireland	1,150	161	39

Beef has sold at from 3s. 4d. to 5s. 8d., mutton 4s. 4d. to 6s. 8d., veal 4s. 4d. to 5s. 8d., pork 4s. 2d. to 5s. 8d. per Sbs., to sink the offal.

COMPARISON OF PRICES.

	Sept., 1859.			Sept., 1860.			Sept., 1861.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Beef from	2 8	to 4 10		2 8	to 4 8		2 10	to 4 8	
Mutton ...	2 10	to 5 2		3 1	to 5 4		3 2	to 5 4	
Veal	3 4	to 4 8		4 0	to 5 4		3 6	to 4 8	
Pork	3 6	to 4 6		4 0	to 5 2		4 0	to 5 0	

	Sept., 1862.			Sept., 1863.			Sept., 1864.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Beef from	3 0	to 4 8		3 4	to 5 0		3 4	to 5 4	
Mutton ...	3 8	to 5 4		3 6	to 5 4		4 0	to 5 8	
Veal	4 0	to 5 0		3 8	to 4 8		4 0	to 5 0	
Pork	3 10	to 4 10		3 6	to 4 0		3 6	to 4 10	

Newgate and Leadenhall markets have been very scantily supplied with all kinds of meat; nevertheless, sales have progressed slowly. Beef from 3s. 4d. to 5s., mutton 4s. 4d. to 6s., veal 4s. 8d. to 5s. 8d., pork 4s. 4d. to 6s. per Sbs., by the carcase.

We understand that large numbers of beasts are still being fattened in Holland for our markets. Much care has been shown of late in shipping animals in good condition; still, disease has frequently made its appearance amongst the stock on arrival in this country.

ISLE OF ELY.

Summer still lingers, and the brightest and warmest weather has been reserved for the last summer month. August was characterized by cloud and almost incessant rain, with scarcely two fine days in succession; hence our early corn crops were secured in poor condition, and fears were excited lest we should be compelled to take our corn to market during the autumn and winter months in a state unfit for immediate use, unless prepared by artificial drying; but the winds and sunshine of the last three weeks have done much to dissipate those fears, and the grain has hardened in the stack, and is now going to market in good condition. We regret our inability to report favourably of the results of the harvest throughout the fen district. Complaints are not occasional, but universal. The yield of wheat is unquestionably bad, and we cannot estimate it at less than 1½ qrs. per acre below an average crop, and fully 2 qrs. below the yield of last year. The fen wheats appear to range between 2½ and 3½ qrs. per acre; some are even less than this, and a few, but very few, a trifle higher. And prices are not better than the crop, from 3s. to 39s. per qr. being given, leaving the return per acre between £5 and £6. This needs

no comment. The fine weather is very favourable for taking up the potato crop, and has done something to check the ravages of the disease. Work upon the farm is generally forward, and the wheat seeding will be an early one, should we have sufficient moisture to enable us to sow when prepared. Coleseed, kohlrabi, and mangolds, are suffering from the heat, except on very cool lands. We shall not have so much winter food as was at one time expected. The cattle plague has done away with cattle markets for the present, and driven sheep up to an exorbitant price. We do not hear that the plague is spreading in this neighbourhood.—YOUR FEN REPORTER.—Sept. 19th, 1865.

NORTH-EAST OF SCOTLAND.

Harvest is now concluded in this district, and the main facts to be recorded concerning it are, that as to weather, we have had one of the finest harvests ever known, and that the crop now in the stack-yards is greatly deficient in bulk. With respect to this latter point, we see no reason to alter the estimate given in our last report, namely, that a deficiency of at least one-third in the bulk of the crop exists in this district; and indeed, we may add that the same may be affirmed of the crop over the whole of the north of Scotland. The deficiency, though not so great in particular districts as it was in 1859, is more general, more widely extended over the north of Scotland, than it was in that disastrous year. Oats, as is pretty well known, are our staple crop, and the deficiency in this crop appears to be general throughout the island. In the small extent of wheat grown in this part of the country (in Morayshire and elsewhere) the deficiency is not so great, arising mainly from the fact that wheat is more patient of drought in May and June than oats. From the fine weather that we had for filling and ripening the grain, and from the superlatively fine weather that we have had during the brief period of harvest, there is every reason to believe that the produce of grain will be rather larger relatively to the bulk of straw, and moreover, that the grain will be of the finest and most wholesome quality. The long continuance of dry weather, which has been so favourable for the harvest, has latterly borne hard upon the turnips. Their growth has been in a great measure prematurely arrested; the tops have faded, and rapidly assumed a sickly yellow hue; while, in the case at least of the earlier-sown fields, they are fast becoming mildewed. The favourable view taken in our last as to the produce of this important crop must therefore be considerably modified. Within the present month the potato-tops have become everywhere affected, or very commonly; indeed, quite blackened by disease, and in many cases the tubers also are said to be rapidly wasting. The dreaded cattle-plague, we regret to say, is still making progress in one of the localities into which it was unhappily introduced by London calves upwards of a month ago. The committee appointed for Aberdeenshire have been working earnestly and energetically, in order to extirpate the plague from the localities in Buchan, in which it has been more or less established for some weeks. Pastures are getting bare, and feeding-stock are now everywhere in upon the turnips. Other stock will doubtless be kept a-field as long as the weather will permit, on account of the undoubted deficiency of winter fodder.—Sept. 20.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ALCESTER FAIR was the smallest known for years, and the attendance was but small. The number of sheep was 320, cows 7 only, pigs 13. Mutton fetched 8½d. to 9d., beef 7d. to 7½d. Pork trade was firm, prices somewhat higher.

BALLOCH HORSE FAIR.—The show of horses was not so good as that of last year, there being comparatively few fine animals on the ground. The demand for this class was, however, brisk, and a clearance was early effected at an advance of prices over those commanded last year. A large number of inferior stock failed to find purchasers, and were led off unsold.

BANBURY FORTNIGHTLY FAIR.—The supply of beasts was much below the average, thanks, no doubt, to the

cattle plague. Stores were nearly unsaleable, and the only trade done was in the best beasts fit for immediate slaughter. The sheep market was better supplied, and trade was brisker. Beef made about 5s. and mutton from 5s. to 6s. per 8lb. on the average. A lot of fine rams belonging to Mr. Craddock were sold by auction at an average of nearly £13.

BARNSTABLE FAIR.—Much business was transacted. Bullocks, in good condition, were in fair supply, and eagerly bought up at from 12s. to 14s. per score; lean sorts were by no means diligent to dispose of at from 7s. to 8s.; steers from £12 to £20; cows and calves from £15 to £21. The supply of sheep was very large, but not out of proportion to the demand; sheep ready for the butcher fetched from 8d. to 9d. per lb.; ewes, 90s. to 12s. each. The horse fair was well stocked, especially with animals for agricultural purposes, in which there was capital choice; the bulk of those exhibited changed owners at good prices. A few first-rate hunters were disposed of.—*Times.*

BLAIRGOWRIE FORTNIGHTLY MARKET.—There was not a single cattle beast shown on the ground. There were a large number of sheep, which sold at extraordinary high rates. Blackfaced wethers sold at 55s. to 47s. each; blackfaced ewes sold at from 27s. to 36s. each, which would average at from 7d. to 9d. per lb. Fat pigs sold at from £3 to £6 10s. each, and young pigs sold at from 12s. to 14s. each, according to size and quality.

BOSTON FOAL FAIR.—The foals shown were principally of the heavy or cart breed, lighter kinds in fact being hardly represented. High rates were demanded in the early part of the day, but as buyers were anything but keen, the prices lowered considerably towards noon, and sales appeared to be numerous. The show of beasts and sheep was not large. The primest sorts of the former made 8s. per stone. The latter, so far as stores were concerned, were a drug, and prices were from 1s. to 2s. a head below recent quotations: fat ones made 9d. per lb.

BROADWAY FAIR was well attended, and a good business done at the following prices:—Horn lambs and cross-breds, 30s. to 40s.; cross-bred cows, 44s. to 50s. Fat wethers scarce, at 8½d. to 9d. Fat beef scarce, at 12s. to 13s. Barreners scarce, and met a ready sale. The display of horses was large, and of a mixed description; sale rather dull.

BRIDGNORTH FAIR was very well attended by farmers and dealers. The show of cattle was small; but those present were sound and in good condition, and good cows realized from 8½d. to 9½d. per lb. The show of sheep was large, and sold from 9d. to 9½d. per lb., and trade brisk. A few agricultural horses were sold at prices ranging from £12 to £20.

CAISTOR FAIR.—There was fully an average show, and a good trade for sheep. Lambs were well sold, and late rates easily maintained. Beasts, especially in-calvers of good quality, fetched high prices, and a clearance was effected early. Shearling rams, the property of Mr. Havercroft, were sold by auction, the best making £38.

CARLISLE SECOND FAIR.—The show of lambs was about 14,000, which exceeds the number exhibited at the corresponding market of last year by at least 5,000. Those consisted chiefly of half-breds, Cheviots, and crosses. The market being peculiarly one for wethers, there was almost an entire absence of ewe lambs. The most of the lots were made up of small and inferior animals, but, though this was the case, nearly as much money was paid for some of them as for the tops. There was a good steady demand for all descriptions, particularly crosses, which went off rapidly at an advance of from 2s. 9d. to 3s. 6d. on the prices current at the lamb market held in Carlisle last month. Cheviots would be up from 2s. to 3s., and half-breds from 1s. 6d. to 3s. 6d. The display of cattle was small as contrasted with last year's market. The bulk of stock on sale were Irish heifers and bullocks, in addition to a few Scotch beasts. Galloway bullocks sold at from £10 to £14; Irish two and three-year-olds at from £10 5s. to £12 15s.; heifers at from £8 to £9; and Highland storks at from £4 to £4 10s. There was a fair sale for all kinds, but there was no material change in value.

DUNSE EWE TRYST.—The show of ewes was scarcely so large as last year, a circumstance to be attributed to the dealers visiting the various farm-steadings and purchasing the ewes at home. Although there was a small rise on the ewes last year, the prices this year are much higher, and there is an active demand for the English markets. The demand to-day

was good for all descriptions of animals, and only those for which extravagant prices were asked were left unsold at the close of the market. The lots of ewes sold were purchased by dealers, both English and district.

GLASTONBURY FAIR was largely supplied with both beasts, sheep, and pigs. The attendance was also good. Trade was not very brisk, although several of the cattle changed hands at high prices. Mares and foals were in abundance, the trade for which was very dull.

GRANTHAM FAT STOCK MARKET.—A short supply of both beasts and sheep. Beef 8s. 6d. to 9s. per stone, mutton 8d. to 9d. per lb. A very fair trade took place.

HOLBEACH FAIR.—There was a large show of horses and foals, and a good deal of business was done, the prices being in advance of those obtainable of late. The top price given for a foal was £18.

HOWDEN HORSE FAIR.—On Monday the attendance of horse-dealers, continental commissioners, hunting gentlemen, general agents, jobmasters, farmers, &c., was as large as we ever remember to have seen. Business was chiefly confined to the inn yards, dealers being very generally employed in taking stock of the fair, inquiring after horses, matching, &c. Some of the best animals were eagerly bought up at high prices, almost as soon as they entered the town. As usual, coach-horses and hunters were most inquired after, though the trade in them was rather slow, and the prices realized lower. Good driving horses sold well. Hunters of celebrity, good stayers of power and speed, sold from 100 to 200 guineas. First-class coach-horses, suitable for broughams, 90 to 120 guineas. Many of the best of the Irish horses, young and well-bred, were selected for hunting purposes. We understand that ten Irish horses sold for 950 guineas. The ordinary animals ranged from about 30 to 50 guineas. On Tuesday morning the fair opened rather slowly. As on the previous day really good horses commanded high figures, but middling and inferior were difficult to be disposed of. Some dealers are buying for the British army. Several continental gentlemen have bought largely for consignment abroad. One of the most important features of to-day's fair was the annual sale of horses, the property of Mr. W. H. Clark, of Hook Hall, near Howden; Mr. Calthorpe, auctioneer. The amount realized for nine horses was 1,056 guineas. Amongst them, Sprig of Nobility, a bay horse, five years old, which took the first prize at the Royal Show, at Newcastle, and several other important prizes, sold for 350 guineas, to Major Staplyton. Also a chestnut horse, Cotton Stockings, four years old, which won the cup at Driffield as the best four-year-old hunter, sold to Mr. Collins, the eminent horse dealer, for 200 guineas. The remainder ranged from 32 to 110 guineas. The attendance on Wednesday morning was again very large. The horses were of an inferior character to those which exchanged hands at the commencement of the week, but there was a tolerably fair amount of business doing. First-class horses, hunters especially, fully maintained the high figures given for them of late years. Some prime hunters sold for from 200 to 300 guineas, though the ordinary prices for them were from 100 to 200 guineas. There was a reduction of about twenty per cent. in the prices of nearly all except first-class animals, the demand for horses not being very great this year. Neat-going active carriage horses made from 40 to 60 guineas. Sound short-jointed horses, adapted for town cabs, vans, and other work of that character, 20 to 25 guineas. Heavy draught horses for brewers, merchants, team work, &c., from 30 to 40 guineas. There was only a short supply of roadsters. First-class seasoned cart-horses realized from 30 to 40 guineas. Young powerful agricultural horses from 18 to 22 guineas. A lot of Shetland ponies were offered at prices ranging from five to six guineas and upwards; not many sales, however, were effected. A large portion of (principally) chestnut horses has been made during the week for the French army. Nearly all the Irish horses have changed hands, but at reduced rates from last year.

ILSLEY FAIR.—The supply of sheep was very small, with a dull trade, at from 1s. to 2s. a head advance on our August fair. Wethers 50s. to 59s., ewes 42s. to 51s., and lambs from 35s. to 51s.

LEWES GREAT SHEEP FAIR.—The number of sheep was far below the average, there being but between 16,000 and 17,000, whereas the average number exhibited for sale is about 23,000; thus there was a marked difference, distinguishable

the moment the field was entered. The number of buyers was large, and their want of lean stock, particularly sheep, being great from the abundance of feed about the country, especially on the rich soil of the western parts of Sussex, the tone of the fair was much in favour of the sellers, the demand was large, extraordinary prices were demanded and realized during the morning; as much as 6s., 8s., and 10s. per head more than last year being given for good sheep. The shortness of the supply, and the high prices which consequently prevailed, are due to a variety of causes. The utmost readiness to purchase was manifested during the morning, and pen after pen was cleared out with astonishing rapidity; but after dinner a slight reaction took place, and the owners of pens who yet held on were compelled to accept rather lower prices than those obtained an hour or so before. The prices of ewes ranged from 40s. to 52s., and for exceedingly good ones as much even as 60s. was made. Lambs fetched from 25s. to 40s. To show the contrast between Lewes fair of the present year and some fifteen years, we append the following:—

	Number.	Ewes.	Lambs.
1850	... 23,000	... 22s. to 26s.	... 15s. to 20s.
1855	... 50,000	... 25s. to 42s.	... 15s. to 25s.
1860	... 30,000	... 30s. to 40s.	... 11s. to 30s.
1864	... 24,000	... 30s. to 42s.	... 17s. to 32s.
1865	... 16,500	... 35s. to 52s.	... 23s. to 40s.

Mr. Humphrey, of Ashington, sold 100 ewes at 60s., to Mr. Monekton, of Kent, they were half resold at 63s., and the others at 61s. At Mr. Arceoll's, Eastbourne, 200 lusty ewes, with their produce, 200 wether lambs in one lot made 55s. per head. The adjoining flock, Birling ewes, quite as good in quality, but being sold a month ago, of course realized less money. At Crow Link, adjoining farm, the value of lambs was 35s. At Friston Place lambs made 35s. or upwards. At West Dean 100 lambs at 42s., and 150 at 36s. At Charleston 130 ewes at 47s. Jevington ewes made, say 42s.; Montague ewes 50s.

LINCOLN FAIR.—There was an average show of beasts and for three-year-old steers, the price was from £20 to £24; two-year-olds £10 to £14, and yearlings 4s to £10.

LINCOLN FAT STOCK MARKET.—A good show of beasts and sheep; the former made 8s. 6d. to 9s. per stone, and the latter 9d. per lb.

LOCKERBIE SEPTEMBER TRYST was largely attended by parties interested in white stock. The number of lambs would be about 23,000, and the number of ewes 1,500. The former consisted of half-breds, Cheviots, crosses, and Highland sheep, and the latter of black-faced and Cheviots. The attendance of buyers was fully as great as heretofore, but though this was the case the market was not so quick as many had been led to anticipate. Prices for all sorts were unusually high; indeed, the like of them were never heard of before at a Lockerbie September market. The highest price going for Cheviot top wether lambs was 26s., for Cheviot mid. ewe lambs 25s., for crosses 32s., for black-faced wether lambs 16s. 6d., for ewe ditto 22s. 6d., for draft ewes (Cheviots) 34s., and for black-faced draft ewes 25s. The rise on half-breds since the August market was from 2s. to 3s., Cheviot lambs from 1s. 6d. to 2s. 6d., crosses 2s. 6d. to 4s., and black-faced lambs from 1s. 6d. to 2s.

LOUTH FAIR.—About 2,400 sheep were penned, but the trade was not quite so brisk as at the preceding week's market. Lambs realised from 30s. to 36s., tupping ewes 40s. to 54s. Fat Sheep were scarce and dear, viz., ewe mutton 8½d., and wether mutton 9d. per lb. A good business was done in beasts, especially in milch cows. Beef 8s. 9d. to 9s. per stone. Several lots of rams were sold, those of Mrs. and Mr. T. Young, of Belleau, averaging £8 15s. 6d. each; Mr. Young's, of Covenham, £10 12s. 6d.; Mr. Scorer's, of Burwell, £4 16s. 8d.; Mr. J. J. Clarke's, of Welton, 45 15s. 3d.; Mr. Chapin's, £7 7s.

MALDON FAIR.—A scanty show of animals generally, and an utter absence of horned cattle. There was a sprinkling of horses—good, bad, and indifferent; but very little business was done. Sheep were better represented, but farmers have brightened up at the large prices obtained during the last fortnight, and have opened their mouths rather wider than dealers fancy for business purposes, and a very large number went back as they came.

MONAIVE FAIR.—There was a brisk and good demand for stock, which consisted chiefly of lambs. The most of the lambs were soon disposed of at satisfactory prices. Mr. Muir-

head, Dumfries, bought a lot of half-breds at 33s. each, being the highest price we heard of; he also bought some clipped cross sheep at £3 each. Eunston half-bred lambs sold at 30s. each; Cheviot ewe lambs at 21s.; Cheviot wether lambs at 18s., and ewe lambs (paleys) at 16s., also a lot of crosses (shots) at 15s.

MUR OF ORD MARKET was the best market for sheep that has ever been held on the stance. The prices are unprecedented, but the reasons are obvious—distrust of the quality of beef in the southern markets, and the consequent demand for mutton, which is not suspected to be tainted with disease; the scarcity of sheep for breeding purposes on the hills, and the short crop of lambs during the last three years. The stock shown was about 400 above last year. Every herd on the ground was sold off, and the demand was equal to far more stock than was offered.

OXFORD FAIR.—From the supply of cow cattle it might be fairly inferred that they are very scarce in the neighbourhood; but we are glad to find that such is not the case; several things militate against a large supply, independent of the prevailing disease (which has hardly been known in this locality). Farmers and graziers have an objection to send their beasts to market, and butchers very much prefer buying them at the homes of the farmer, and keep is also abundant. Beef of the best quality made 8d. per lb. Stores were quite as dear. The sheep market was largely supplied and well attended, and every head changed hands, and in most instances more than once; we were credibly informed that had there been 5,000 more penned they would all have been sold. Stores, it was remarked, made very near as much money as fat mutton; of the latter little was at market, and sold readily at from 7½d. to 10d. per lb. Figs were very scarce and very dear; bacon hogs from 11s. to 12s.; porkers, 11s. 6d. to 12s. 6d. per score.

PARTNEY FAIRS.—The number of sheep, although very large, was not perhaps quite equal to that of 1864, but they were generally of excellent quality, of large size, and full of wool. The business of the day commenced at early dawn, and nearly all the best animals were quickly disposed of. Lambs sold remarkably well, and at prices never before attained. Mr. Morrison, of Ashby, sold a lot descended from a sheep bought of Mr. Betts, of Holbeck-lodge, at 51s. Some pens of good drupe ewes, for breeding purposes, made as much as 72s. A lot of 100 fine shearlings, the property of M. Staniland, Esq., of Harrington-hall, averaged 64s. The general run of prices for lambs was from 40s. to 48s., drapes from 58s. to 64s. Shearling ewes and wethers were much inquired for, and sold at higher prices than in August; and before the fair closed every sheep was or at least might have been profitably disposed of. The beast fair was comparatively small. A dread of the terrible rinderpest no doubt caused many persons to keep their cattle at home, rather than expose them to the consequences which might be apprehended from sending them to a public fair. Those which were shown sold well. Young steers and heifers were quickly caught up, as were all animals ready for the butcher. In the prices of beef and mutton there was no reportable alteration, but there appears to be a growing opinion that the present high prices cannot much longer be maintained.

PENRITH FORTNIGHTLY MARKET.—There was a good display of both sheep and lambs, numbering altogether about 1,200. Generally speaking, the quality and condition of the animals were excellent; and there being a large attendance of buyers from a distance as well as for "home consumption," a keen competition set in early for the best lots, which brought a slight advance upon former rates. Only six beasts, and their condition was inferior; the three calves shown were quickly secured. Indeed, in every department of the market a good clearance was effected at an early hour, at the following average prices: Beasts 7s. 6d. to 8s. per stone, sheep and lambs 8d. to 9d., and calves 9d. per lb.

PROBUS FAIR was slightly supplied with bullocks. Of sheep there was an ample supply, but they sold off well, and at good prices. Fat bullocks were very scarce, and fetched from 64s. to 66s. per cwt.; lean, 47s.; cows and calves, 58s. Fat sheep, 7½d. to 8d. per lb.; store ditto about 7d.; lambs, 25s. each.

READING FAIR.—The supply of stock was far below the average of previous fairs here, although quite adequate to the demand, as the existing cattle plague, which has not exceeded this county in its visitation, precluded speculation in store beasts, and farmers decline to stall up cattle for fattening

purposes, until the disease is checked or presents a more favourable aspect. A limited business was transacted among store steers from £11 to £14 per head. Milking cows sold pretty freely to dairy farmers, at £17 to £22 each; and grass-fatted cattle realised £16 to £25; but many herds of stock hofers and young store beasts remained unsold. The horse fair comprised a good show of first-class animals and young horses, suitable for phaetons and private harness purposes were selected at from 35 to 45 guineas; and strong well-grown horses, for heavy draught work, 30 to 40 guineas. Handsome young and sound cart-horses, for London purposes, 45 to 50 guineas; and seasoned ditto, for farmers' work, 18 to 24 gs.; cart colts, 25 to 35 gs.; superior bred riding-horses, 50 to 65 gs.; neat cobs, 14 to 15 gs.; ponies, 6 to 10 gs.; and Welsh pony colts, 4 to 6 gs.

ST. COLUMB FAIR.—There was an excellent supply, both of fat bullocks and sheep, the former selling at from 65s. to 68s. per cwt. Fat sheep were in great demand, especially wethers, and sold at from 55s. to 60s. each, and from 7½d. to 8d. per lb. Store ewes were from 40s. to 50s. each.

TWICKESBURY FAIR.—There was a very large attendance. The supply of stock was unusually large, the number of sheep penned being greater than was ever remembered before. The auctioneers did a large business.

TOWYN FAIR.—The supply of cattle (very limited) met with ready sale at high prices. The demand was very great, and many buyers from a distance came to purchase. Yearlings fetched £6, two year olds £10 to £13 per head. Milch cows £12 to £15, steers varied according to size.

FOREIGN AGRICULTURAL GOSSIP.

The *Journal d'Agriculture Pratique* gives a spirited engraving of Toquade, an Anglo-Limousin trotting mare. The improvement or revival of the indigenous horse breeds of France, especially of those which had acquired a reputation, is obviously one of the most important questions of which a solution can be aimed at; the problem becomes still more interesting when it concerns a race formerly celebrated and which has now almost disappeared. This is particularly the case with the Limousin breed of which M. Gayot has remarked in his *Connaissance Générale du Cheval*: "Of the old breeds of France, it is this which has deserved the first rank. Of all it was the most accredited in Europe, and it had become a national glory. There are, however, no more horses in Limousin, or at least there is no more horse-breeding in that district." After these rather dolorous words, it was satisfactory to read in a journal of the Cher that an Anglo-Limousin mare, belonging to M. Jules Friclion, proprietor at the Terre (Indre), and ridden by its owner, had carried off the trotting prize at the five races recently inaugurated at Bourges; as the fact showed that there were still breeders who devoted themselves to the breeding of the animal which was formerly the French saddle horse *par excellence*. Toquade trotted a distance of 2,500 metres in five minutes, being at the rate of nearly 19 miles per hour. She is a daughter of Bichette, a pure Limousin, and of Bijon, an Anglo-Limousin; she is, then, three-fourths Limousin blood. She has all the characteristics of the Limousin breed, and her photograph engraved by the *Journal d'Agriculture Pratique* is certainly that of a very pleasing animal.—An international agricultural exhibition held recently at Cologne marks an epoch in German agriculture, because it had the stamp of universality, which was lacking in all its predecessors. It was not like the shows held during the last year or two at Hamburg and Stettin, an exhibition of the products of the north of Europe, but among its immense muster-roll of exhibitors were a great number of English, Italians, Spaniards, Russians, Algerians, Americans, &c. The exhibition was due to the initiative of a comparatively private society named the Flora, and it was organized, or perhaps as we ought rather to say improvised in a month. The original site was confined to the botanical garden of this society, but it was obliged to be extended by the adjunction of adjacent lands, so that it occupied at least a surface of about 24 acres. In this area might be seen 12,450 implements, machines, &c., and 6,500 lots of agricultural products. If we consider that all the district shows combined in France only presented in 1865, 4,952 engines and implements, and 1,739 lots of products, it will be easy to form an idea of the importance of the Cologne exhibition. Add to this statement the fact that these products were laid out in a well-designed garden, under elegant shelter, and you will have, reader, a tableau all the more splendid since it had for accessories the city of Cologne with its fine buildings, and the Rhine, and one of the districts most advanced in agriculture for its base. The exhibition was opened June 2, and closed July 2. It was confined to the inanimate agents of agriculture, which were divided into the six following categories: First, agricultural engines and implements; secondly, household and domestic utensils; thirdly, garden architecture; fourthly, sylvicole products; fifthly, the raw

and manufactured products of agriculture; sixthly, geological and mineralogical products. This extensive programme enabled agriculture to extend a large hospitality to products which would have been more in their place in an industrial or artistic exhibition. The great majority of the machines and implements known and recommended in the agricultural world figured at the show, but as in all late exhibitions steam-engines were the most sought after, because in the present circumstances of production the cultivator and the economist anticipate from them an improvement in the present position of agriculture. Of the three steam-ploughs which should have taken part in the exhibition only one presented itself, viz., Fowler's with its successive improvements. Messrs. Garrett and Messrs. Howard declined to compete in consequence of the want of success which they experienced at Stettin, and which they do not consider that they deserved. Fowler's plough worked in the presence of the Prince of Prussia and excited astonishment by the energy with which its four shares attacked the soil. Three traction-engines—or as the French call them, *autoneobills*—worked during the whole period of the show, and acquitted themselves, empty or loaded, to the satisfaction of the spectators. One of these engines exhibited by Schwarzhop, of Berlin, occasioned a fire, which, thanks to the steam fire engines exhibited at the show, was easily suppressed. The steam fire engines, we may add, contended tenaciously for the prize, and after numerous experiments, it was awarded to the apparatus of Messrs. Merryweather and Sons, of London. More than 50 thrashing machines were put in motion by steam; they belonged, for the most part, to the best English houses, such as Messrs. Ransomes and Sims, Messrs. Clayton and Shuttleworth, &c. The German makers, nevertheless, sustained an active competition against them: the house of Püntus especially distinguished itself under this head. Among the great number of portable engines intended to be used as motors for agricultural purposes that of MM. Tilkin, Mention, & Co., of Longloz-lez-Liège, was a good deal remarked. A centrifugal pump, of which several inventors disputed the idea, and which was also shown by MM. Tilkin, Mention, & Co., likewise attracted some notice. The merit of the idea was disputed by several inventors: Denis Pappin, when he was professor at the University of Marburg, published a description of a centrifugal pump, and it is after this description that MM. Tilkin must have constructed their apparatus. A Lenoir motor, exhibited by Mévius, of Hamburg, was of three-horse-power, and was from the workshops of MM. Gantier and Co., of Paris. As regards other motive forces, nothing new was remarked. Transmissions of movement for long distances by the aid of metallic cables were principally applied by Guillaume and Felton, of Cologne. It appears that this system is likely to exert an important influence in the future, judging from its rapid propagation. More than a dozen reaping and mowing machines took part in experiments which came off June 3, in a field of rye still green. The majority of the novelties figured badly in the affair, and were obliged to retire from the competition. The machine of Samuelson, of Banbury, overcame all difficulties, although they were by no means of an ordinary character. A Cologne maker, named Erpelding,

had also a good success. This industrial has, for some time past, constructed reapers on plans which he had received from America, and which he has since modified. If from machines we passed to implements, we found at the Cologne-show a collection of the ploughs of Dr. Race, an old professor at Hohenheim. This collection (which comprised no less than 174 models executed with the greatest exactitude) was a striking illustration of the progress of cultivation and of its history; it showed how the mere curved branch underwent a gradual series of transformations until it became the improved plough of our own times. Of the other ploughs exhibited, those of Eckert (of Berlin), Hohenheim, and Bertz carried off the most successes. The steam cooking apparatus of Basse, of Kassel, the apparatus of the Household Society of Paris, and the straw-cutter of Eberhardt, of Ulm, presented some points of novelty; and the rich collections of gardening-tools exhibited by Beyersmann, of Weringhausen, and Asbeck, of Hagen, were also noticeable for their beauty and cheapness: in the latter respect they defied all competition. A collection of the agricultural and forest products of Algeria deserves to be placed at the head of all the assortments exhibited in the section of agricultural and forest products. We may mention the textile products, cottons, &c., the wheat, bran, and tobacco of this colony as worthy of notice. This section comprised also wool from Buenos Ayres, cheiory from Belgium, ale and wool from England, and flax and hemp from Russia. Tobacco was most powerfully represented by exhibitors from America, Baden, Prussia, Hanover, Bremen, and Russia. There was also a good collection of spirits, wines, beers, and liqueurs. Commercial manures were annexed to the section of agricultural

products, and profited largely from the arrangement. The fossil phosphates of M. de Molou obtained a special distinction. The forest exhibition was very complete. Besides wood of every kind, there was a complete collection of sleepers exhibited by eighteen of the principal administrations of continental railways. These specimens enabled a conclusion to be drawn as to all modes of preservation, the sleepers having been withdrawn from the ground after a long period of interment. The palm remained with the creosoting and sulphatizing processes. The forest administration of Hanover sent a rich and varied collection, and a collection of the maritime signals employed in Prussia was also on view. The object of the latter was to make known to forest proprietors the woods required by the Admiralty.—An agricultural show of some interest has just been held in the French department of the Creuse; or, to be more precise, at the town of St. Sulpice-les-Champs. The bovine race was largely represented. There were 70 or 80 bulls, of one year to thirty months old; 30 heifers of the same age, and a few more cows which had exceeded that age. The prevailing race was that of the district: there were also some animals of the Limousine, Salers, Parthenaise, and Charolaise breeds. The exhibition of cattle left, however, a good deal to be desired, notwithstanding the presence of a great number of really remarkable subjects. The prizes devoted to these beasts amounted to £126, of which only £32 was devoted to heifers and calves. The exhibition of sheep was superior to that of cattle. There were some excellent rams on view, and several lots of ewes and lambs, which seemed to be well-selected. The amount of the premiums awarded to sheep was £30. Pigs were somewhat feebly represented.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The year, as far as it has advanced, has been of an extraordinary character. With a deluge of rain in August, we have had a renewal of summer in September, with tropical heat; and the rain has been limited to a few thunder-showers, and one heavy fall on the night of the 20th, which did much good. Those, therefore, who were late with harvest work had what may be called "extraordinary luck;" and our northern friends this season will have fared far better than their southern brethren, while the power of the sun has been such as partly to penetrate the stacks out of order, as well as benefit the corn spread out to dry. But, though the cold and late farms will this season be best off, we cannot boast, as a whole, of samples; and much must pass through the frosts of winter before it will find a ready sale to millers. The quality, moreover, does not come up to the average of late years; and though there are fine heavy samples to be procured, the best will not compare with 1864 or 1863. If we reach an average, under these circumstances, we shall be surprised. But an average growth, we have long found out, is not enough for the annual consumption of the country; and though we cannot speak very favourably of the British Isles, it seems more certain that Europe is seriously under the mark. France is partially deficient, Germany still more so, and Poland suffered fearfully in August, while part of Southern Russia notes a failure. Beyond this state of things, American advices from the West prove bad, and accounts from New York bid us not to expect what we have been recently receiv-

ing. Added to this intelligence, reports of the late potatoes come worse and worse; and, with the cattle plague fastened on the country, prospects are more discouraging than for some years as to the supply of human food. Yet such was the influence of the change of weather from the rains of August, that for the first fortnight of the past month markets came tumbling down, as though it were a year of plenty, new wheat being cheaper 3s. to 4s., and old 1s. to 2s., till a little reaction at last appeared, and people seemed coming to themselves. We thought the lowest point was reached on the 18th, and said so; and we now think before next harvest a rise of fully 10s. per qr. is very probable. The following rates were recently current at the places named: The best wheat at Paris was quoted 43s. per qr., at Antwerp fine native red was 47s. 6d., at Louvain 46s., at Maestricht the top price was 45s. per qr. In Hamburg, Marks wheat was quoted 45s. 6d.; and some speculation had commenced, from the badness of the crops in the surrounding districts. At Danzig the best wheat of 1864 was worth 47s. 6d. per qr. free on board; and fine old, cost and freight included, was held at 58s. per qr. At Cologne the price of red was 41s., at Straubing 33s. Marianopolis wheat, afloat, has been sold at 41s., Ghirka at 40s. At Montreal spring wheat was worth 37s. 8d. per qr. of 480lb. New York prices were very high—Chicago and Milwaukee 38s. to 38s. 6d. per 480lb. the best amber, 49s. per 480lb. white.

The first Monday in Mark-lane began on a moderate supply of English wheat, with fair arrivals

of foreign. There was only about an average show of samples during the morning from Kent and Essex, mostly new, and some of it in such sorry plight as to be quite passed by, or sold at very irregular rates. Even the best qualities were down 2s. per qr., while old scarcely supported the previous rates. The foreign trade was excessively dull; and where sales ex ship were forced, holders had to consent to some reduction. With few arrivals off the coast, there was but little abatement on cargoes. With the return of summer weather at its height, farmers who were late were intent upon securing the benefit; but many sent their badly-secured produce to market, and were generally obliged to accept a reduction of 2s. to 3s. per qr. on new samples, with an occasional decline on old, the value of which was affected by the quantity sent to market. At Edinburgh wheat was down 1s. 6d. per qr., and at Glasgow the decline on all sorts was 1s. per qr. Dublin was thoroughly dull, with so little doing that prices could only be considered nominal.

On the second Monday there was less English and more foreign wheat in the returns. There was a rather larger show of samples this morning from Kent and Essex, with several parcels in better condition, as a consequence of the improved weather; but there was still a large proportion of poor quality. This was another dull and falling market, with very little done, though a decline of 1s. to 2s. would have been gladly accepted to make way; while old was also down 1s. per qr. The foreign trade was perfectly lifeless; and to do business only in retail, it was necessary to yield 1s. per qr. It was well, at such a time, that but few floating cargoes were reported; for even these could only be sold on somewhat easier terms. The weather continuing unprecedentedly fine and hot, nothing could be more opportune for the later gatherings; but, as a consequence, there was no diminution of the previous heaviness, and a decline to the same extent, in the country, on new samples was the order of the day—say 1s. per qr. on old, as reported at London, and 1s. to 3s. on new, according to quality, the lowest being the most difficult to clear. Wheat at Glasgow was also down another shilling per qr.; but at Edinburgh there was little difference, though trade was dull. Native wheat, not being in large supply at Dublin, did not seriously decline; but foreign was down 6d. to 1s. per barrel.

The third Monday's returns showed an increased quantity of home-grown wheat, with liberal foreign arrivals. The show of samples on the Fentish and Essex stands this morning was materially reduced, and the condition as much improved, farmers appearing disinclined to continue a course of sacrifice with their new crop. Rather more disposition to do business was evinced on the part of millers; but it was found impracticable to raise prices, though a tolerable clearance was eventually made of the little offering for sale. A retail trade was experienced for all good dry granary samples, at about previous rates; but to have sold any quantity from ship would have required some reduction. With but few cargoes afloat offering, and holders pretty firm, there was no change in prices. The

weather this week kept fine up to Wednesday night, allowing the bulk of the late harvest throughout Great Britain to be secured in good order. Farmers were not, however, further disposed to lower prices, in order to sell, and many markets evinced an upward tendency for all good qualities, both new and old. Indeed, at some places—as Boston, Lincoln, York, Wakefield, and elsewhere—1s. per qr. advance was noted. Birmingham was full-priced, and Liverpool on the last market rather dearer. Edinburgh noted no change this week; but at Glasgow new Wheat was 1s. per qr. lower. Dublin was down 6d. per barrel, with very little trade.

On the fourth Monday the arrival of English wheat was moderate; but the foreign supply more abundant than during any previous week, nearly half being from Danzig, and one-fourth from Russia. The morning's show of samples was small, the condition being further improved, but most of the quality still inferior. Many country markets having somewhat improved, factors were generally enabled to secure 1s. advance on new samples, which had previously been unduly depressed; but old, having been held at full prices, did not participate in the improvement. The foreign trade was mostly on a retail scale; but here and there favorite qualities obtained rather better prices, and, though the trade was far from active, holders were generally firm.

The imports into London for four weeks were 22,182 qrs. English and 103,990 qrs. foreign, against 26,954 qrs. English and 81,954 qrs. foreign for the same period in 1864. The London averages commenced at 47s. 6d., and closed at 42s. 2d. per qr., while the general average began at 45s. 4d., and ended at 44s. 7d.—the lower rates for London being attributable to the quantity of inferior new wheat sent up. The imports into the Kingdom for the four weeks ending Sept. 16, were 1,926,691 cwts. wheat, and 235,280 cwts. flour. The London imports for four weeks were 780 qrs. wheat, and 1,287 cwts. flour.

The flour trade during the month has been remarkably steady as compared with wheat, prices throughout not having undergone any material change. This may partly be attributed to the very scanty foreign arrivals and lowness of the stocks of American, which almost placed the trade into the hands of town factors. Norfolks have ruled at 33s. per qr. for the best, and barrels have been at retail prices, while the town trade has been steady, the top price remaining 43s. all through. The imports into London for the four weeks were 70,103 sacks English, and 1,085 sacks 9,668 brls. foreign, against 53,723 sacks English, and 1,267 sacks 77,972 barrels foreign for the same period in 1864. At the recent rates ruling at New York and Montreal there is very little prospect of liberal imports this side Christmas.

Business in malting barley can hardly be said to have yet commenced, supplies hitherto being very insignificant, and the weather quite against trade, from its extreme heat. The few very fine bright-coloured samples that have hitherto appeared have gone off freely at full prices; but those discoloured by the rains of August attracted very little atten-

tion, and were difficult to quit. Heavy foreign, though at the beginning of the month it found favour from the want of settlement in the weather, became neglected, as it settled into fine, and even granary sorts have met with less inquiry, though prices have been low—say 22s. to 23s. per qr. for Danube qualities. As much of the English crop is likely to prove inferior, the trade may be heavy till cold weather sets in. The imports into London for the four weeks were 4,365 qrs. British, and 20 131 qrs. foreign, against 5,531 qrs. British, and 24,976 qrs. foreign for Sept. last year.

Malt, which at the beginning of the month was tending upwards, has lost the improvement during the fine weather.

The supplies of foreign oats during the month being less than half what they were in August, it might have been expected that prices would have improved; but the fine weather was against it, as well as the fact that large dealers had well stocked themselves during the glut, and could very well hold off till arrivals again became liberal. This they did on the fourth week, and had it not been for the increased demand, lower rates might have ensued. But the belief in the shortness of the English crop, and diminution of stocks on the part of dealers, kept rates at about their previous range, excepting a slight reduction on Russian, and we do not see much prospect of decline before Christmas. The imports into London for four weeks were 8,360 qrs. English, 396 qrs. Scotch, 3,086 qrs. Irish, and 134,946 qrs. foreign, against 7,322 qrs. English, 6,497 qrs. Scotch, 14,048 qrs. Irish, and 191,811 qrs. foreign in Sept. 1864.

Beans have not varied in value through the month, but have gradually been tending upwards, notwithstanding the high rates at which they began. Samples of the new crop cannot come in quantity yet awhile, and will not be liked for consumption. So old foreign as well as English are likely to become very scarce and dear as the cold season advances, and nothing could check a further advance but the low rates of barley, oats, and maize. The imports into London for four weeks were 773 qrs. English, and 2,261 qrs. foreign, against 2,355 qrs. English, and 5,280 qrs. foreign last year. So that the imports this month are less than one-half.

The demand for peas has been very moderate during the month, so that the smallness of the supplies have not caused any advance on hog feed, though boilers of fine quality have rather improved in value. The stocks of old foreign white, used as a substitute for beans for the feeding of horses, has become very much reduced, and being cheaper than that grain, will soon be used up, and very probably turn the attention of consumers to Indian corn. The imports into London for the four weeks were 1,405 qrs. English, and 1,251 qrs. foreign, against 1,400 qrs. English, and 5,605 qrs. foreign in Sept. 1864.

There has been a considerable diminution in the imports of linseed, and with oil much dearer it has risen 1s. per qr., though cakes have not altered in value, their demand being lessened by the rapid growth of grass and esculents after the August rains. The seed trade, which was becoming excited in August, has sunk into quiet.

New cloverseed has been offering from France at moderate rates, though the crop there is sure not to be large. In America it is reported as abundant, but prices have not yet settled for business. Mustardseed has been dull, and cheaper for inferior qualities. Canaryseed has risen 2s. or 3s. per qr.; but winter tares, abundantly offered and of poor quality, have fallen to 5s. and 5s. 6d. per bushel.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

	Shillings per Quarter.		
WHEAT, Essex and Kent, white	new 35 to 45	44 to 52	
"Norfolk, Lincoln, and Yorkshire, red	34 43	41 46	
BARLEY	27 to 30	Chevalier, new 30 37	
Grinding	26 29	Distilling	28 32
MALT, Essex, Norfolk, and Suffolk		58 66	
Kingston, Ware, and town-made		58 66	
Brown		50 54	
RYE		26 28	
OATS, English, feed 19 to 23	Potato	22 27	
Scotch, feed 15 23	Potato	22 27	
Irish, feed, white 17 20	Fine	21 24	
Ditto, black 17 20	Potato	21 24	
BEANS, Mazagan 35 39	Ticks	36 39	
Harrow 39 41	Pigeon	41 46	
PEAS, white, boilers 37 41	Maple 37 to 40 Grey, new	35 37	
FLOUR, per sack of 280lbs.	Town, Households	38 43	
Country, on shore 31 to 34	"	35 36	
Norfolk and Suffolk, on shore	"	31 33	

FOREIGN GRAIN.

	Shillings per Quarter.		
WHEAT, Dantzic, mixed	47 to 51	old, extra 51 to 57	
Königsberg	45 49	extra	49 51
Rostock	45 49	fino	50 51
Silesian, red	43 45	white	46 48
Pomera, Meckberg, and Uckermark	red old	43 49	
Russian, hard, 38 to 39	S. Petersburg	and Riga 42 44	
Danish and Holstein, red		41 43	
French, none	Rhine and Belgium	44 49	
American, red winter 44 to 47, spring 43 to 46, white	47 50		
BARLEY, grinding 22 to 25	distilling and malting	27 32	
OATS, Dutch, brewing and Poland 18 to 23	feed 17 21		
Danish and Swedish, feed 19 to 22	Stralsund	19 23	
Russian, Riga 19 to 22	Arch. 18 to 21	P'sburg 20 24	
BEANS, Friesland and Holstein		35 38	
Königsberg	35 to 39	Egyptian	37 38
PEAS, feeding and maple 36 39	fine boilers	39 41	
INDIAN CORN, white	30 35	yellow	30 34
TARES, p. bush, winter 5s. 5s. 6l.	Lentils	—	
FLOUR, per sack, French 32 35	Spanish, p. sack	32 35	
American, per brl. 22 24	extra and d'ble.	25 27	

IMPERIAL AVERAGES

For the week ended September 16, 1865.

Wheat	62,441½ qrs.	4s. 7d.
Barley	6,179 "	20s. 10d.
Oats	5,329½ "	20s. 11d.

AVERAGES

FOR THE LAST SIX WEEKS:	Wheat.		Barley.		Oats.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
August 12, 1865	42 0	27 10	23 5			
August 19, 1865	43 1	27 11	23 10			
August 26, 1865	45 4	30 0	24 3			
Sept. 2, 1865	46 7	31 2	23 7			
Sept. 9, 1865	46 0	31 2	23 1			
Sept. 16, 1865	44 7	30 10	20 11			
Aggregate Average	44 7	29 9	23 2			
Averages last year	42 4	32 1	21 9			

COMPARATIVE AVERAGES.

Years.	WHEAT.		BARLEY.		OATS.	
	Qrs.	s. d.	Qrs.	s. d.	Qrs.	s. d.
1861	50,117½	54 6	9,285½	36 4	9,174½	22 11
1862	58,989½	55 10	2,326½	36 7	7,276½	24 7
1863	78,909½	44 1	9,257½	34 7	6,355½	21 8
1864	65,613	42 4	5,316½	32 1	5,475½	21 9
1865	62,441½	44 7	6,179	30 10	5,329½	20 11

LONDON AVERAGES.

Wheat	4,964 qrs.	42s. 2d.
Barley	344 "	32s. 9d.
Oats	285 "	20s. 1d.

FLUCTUATIONS in the AVERAGE PRICE of WHEAT.

PRICE.	Aug. 12.	Aug. 19.	Aug. 26.	Sept. 2.	Sept. 9.	Sept. 16.
42s. 0d.
43s. 1d.
44s. 7d.
45s. 4d.
46s. 0d.
46s. 7d.

PRICES OF SEEDS.

LONDON, MONDAY, Sept. 25.—The trade in Cloverseed continues inactive, and the moderate values required for new French do not induce buyers to commence operations. White seed and Trefoils are without alteration. Winter Tares were without alteration from last week's values. Canaryseed fully maintains its value, with improved sales. CUTLER AND BARKER, Seed-factors.

BRITISH SEEDS.

MUSTARD, per bush., white	10s. to 12s.
CANARY, per qr.	50s. 56s.
TARES, winter, new, per bushel	5s. 6d. 5s. 6d.
CLOVERSEED, red	—s. —s.
CORIANDER, per cwt.	—s. —s.
TREFOIL	27s. 28s.
LINSEED, per qr., sowing 56s. to 62s., crushing	54s. 58s.
RAPESEED, per qr.	72s. 76s.
LINSEED CAKES, per ton	£9 10s. to £10 10s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS.

CORIANDER, per cwt.	20s. to 22s.
CARAWAY	—s. 33s.
TREFOIL	25s. 26s.
HEMPSEED, small—s. per qr., Dutch	—s. 48s.
CLOVERSEED, red—s. to —s., white	—s. —s.
LINSEED, per qr., Baltic 58s. to 60s., Bonhay	68s. —s.
LINSEED CAKES, per ton	£9 10s. to £11 0s.
RAPESEED, Dutch	—s. —s.
RAPE CAKE, per ton	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Sept. 25.—There is a good demand at present in our market for all Hops of the new growth, attention being directed chiefly to samples of best quality. Prices of colour Hops continue firm, and at Worcester Fair and elsewhere large parcels have changed hands during the past week.

Mid and East Kents	115s., 140s., 160s.
Farnhams & Country	115s., 126s., 160s.
Weald of Kents	100s., 110s., 124s.
Sussex	95s., 105s., 112s.
Yearlings	95s., 120s., 140s.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Sept. 25.—The supply of Potatoes on sale tolerably large. Good and fine qualities are in steady demand, at from 80s. to 110s.; otherwise the trade is dull, and prices rule as low as 40s. per ton. About 70 tons came to hand from Continental parts last week.

COUNTRY POTATO MARKETS.—DOXCASLER, (Saturday last): A plentiful supply, which met with a good demand at the following prices—wholesale 6s. to 7s. per load, retail 8d. to 10d. per peck. MANCHESTER, (Saturday last): Potatoes 5s. to 6s. 6d. per 252lbs.

PRICES of BUTTER, CHEESE, HAMS, &c.

BUTTER, p. cwt.—s.	CHEESE, per cwt.—s.	s.
Friesland.....120 to 126	Cheshire.....	64 to 76
Jersey.....	Dble. Gloucester.....	66 70
Dorset.....124 128	Cheddar.....	66 76
Carlou.....	American.....	56 62
Waterford.....	HAMS: York.....	94 112
Cork.....	Cumberland.....	94 116
Limerick.....	Irish.....	90 100
Silgo.....	BACON:—	
FRESH, per doz., 12s. 0d. to	Wiltshire.....	82 88
16s. 0d.	Irish, green.....	74 82

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Sept. 25.—Since our last Butter has become dearer, and prices current now are—
Dorset, fine 125s. to 130s. per cwt.
Devon 120s. to 124s. per cwt.
Fresh 13s. to 16s. per dozen lbs.

CORK BUTTER EXCHANGE, (Saturday last).—In the beginning of the week the supplies were light, and prices were well sustained; but on yesterday and to-day the quantity of butter in market was very large, being over 2,000 yesterday, and about 2,800 to-day; and the demand was consequently less. Since Monday, firsts rose from 120s. to 122s., seconds from 116s. to 117s., thirds from 108s. to 111s., and fourths from 98s. to 100s.; but fifths fell from 85s. to 93s. The supply of mild cured is small but steady. Its price to-day is 126s., 122s., and 115s.

GLASGOW, (Wednesday last).—Supplies of cheese come forward freely, and, though buyers are rather cool, prices are well maintained. About 30 tons passed the weigh-house scales. Dunlop, old 63s. to 68s., new 59s. to 62s.; Cheddar-made, new 62s. to 66s.; skin-milk, 24s. to 26s. per cwt.

READING CHEESE FAIR.—In cheese an advanced value is obtained; singles make 50s. to 66s., and doubles 70s. to 80s. per cwt.

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, Sept. 25.—There has been a fair demand for home-grown Wool for export purposes since our last report, at full quotations. For home use, however, next to nothing has been doing. The quantity of Wool on offer continues limited: the prospect is, therefore, that prices will continue steady.

CURRENT PRICES OF ENGLISH WOOL.	s.	d.	s.	d.
FLEECES—Southdown hoggets.....per lb.	1	8	1	9
Half-bred ditto.....	2	0	2	1
Best Heeces.....	2	0	2	0½
Southdown ewes and wethers	1	8½	1	9
Leicester ditto	1	10½	2	0½
Sorts—Clothing.....	1	6	1	11
Combing.....	1	7	2	0

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS.

The demand for English wool is good, but there is no disposition to speculate. The consumption keeps up, and the trade seems healthy for most kinds of wool. In clothing wool there is a fair business doing and prices are steady, but for good sound styled wool rather higher prices can be got.

LIVERPOOL WOOL MARKET.—Sept. 23.

SCOTCH.—The demand continues on the same limited scale as reported last week. Stocks of all kinds are unusually light for this period of the year.

Laid Highland Wool per 24lbs.....	s.	d.	s.	d.
White Highland do.	18	0	20	0
Laith Cheviot do. unwashed	23	0	26	0
Do. washed	24	0	30	0
White Cheviot do. washed	40	0	48	0

FOREIGN.—There has been a fair business done during the week at full late current rates.

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importer's stores, or ex ship (30 tons) £12 5s. to £12 10s. per ton.	
Bones, £6 10s. per ton.	
Animal Charcoal, £70 per cent. Phosphate £2 per ton.	
Coprolite, Cambridge, whole £2 5s. to £2 8s., ground £2 15s. to £3; Suffolk, whole £1 18s. to £2, ground £2 10s. to £2 12s. per ton.	
Muriate of Potash, £13 to £14 per ton.	
Nitrate of Soda, £15 to £15 10s. per ton.	
Sulphate of Ammonia, £14 to £15 per ton.	
Gypsum, 30s. per ton. Superphosphate of Lime, £5 to £6 5s. per ton.	
Sulphuric Acid, concentrated 1845 1d. per lb., brown 1712 9/16d.	
Blood Manure, £6 5s. to £7 10s. per ton. Dissolved Bones, £6 15s. p. ton.	
Linseed Cakes, best American barrel, £11 5s., ditto bag £10 10s. p. ton; English, £11 to £11 10s. Rape Cake, £5 15s. to £6 per ton.	
E. PURSER, London Manure Company, 116, Fenchurch Street, E.C.	

Guano, Peruvian £12 7 6 to £20 0 0	Linseed Cake, per ton—	
Do. Upper do. 5 15 0	Americ. thin, bgs. £9 0 0 to £9 5 0	
Koola Moorla 0 0 0	Do. in bbs. 0 0 0	
Bone Ash 0 0 0	English 0 10 0	10 0 0
Brimstone, 24&3rd 0 0 0	Cotsd. Cake, decort. 0 0 0	0 0 0
Saltpetre, Bengal 0 0 0	Linsd. Bomby, p. qr. 3 12 0	3 12 6
2 per cent. Soda 0 0 0	0 0 0	0 0 0
Nitr. of Soda, p. ct. 0 12 6	0 13 6	Niter 2 5 0
Clovesced, Amer. 0 0 0	Tallow, 1st P.Y.C. 2 7 0	0 0 0
Red, new per cwt. 0 0 0	0 0 0	super. Norths 2 7 0

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IMPORTANT TO FLOCKMASTERS.

THOMAS BIGG, Agricultural and Veterinary CHEMIST, by Appointment to His late Royal Highness The Prince Consort, K.G., Leicester House, Great Dover-street, Borough, London, begs to call the attention of Farmers and Graziers to his valuable SHEEP and LAMB DIPPING COMPOSITION, which requires no Boiling, and may be used with Warm or Cold Water, for effectually destroying the Tick, Lice, and all other insects injurious to the Flock, preventing the alarming attacks of Fly and Shab, and cleansing and purifying the Skin, thereby greatly improving the Wool, both in quantity and quality, and highly contributing to the general health of the animal.

Prepared only by Thomas Bigg, Chemist, &c., at his Manufactory as above, and sold as follows, although any other quantity may be had, if required:—

4 lb. for 20 sheep, price, jar included	£0 2 0
6 lb. 30 " " " "	0 3 0
8 lb. 40 " " " "	0 4 0
10 lb. 50 " " " "	0 5 0
20 lb. 100 " " (cask and measure	0 10 0
30 lb. 150 " " included)	0 15 0
40 lb. 200 " " " "	1 0 0
50 lb. 250 " " " "	1 3 6
60 lb. 300 " " " "	1 7 6
80 lb. 400 " " " "	1 17 6
100 lb. 500 " " " "	2 5 0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

MOST IMPORTANT CERTIFICATE.

From Mr. HERAPATH, the celebrated Analytical Chemist:—
Bristol Laboratory, Old Park, January 18th, 1861.

Sir,—I have submitted your Sheep-Dipping Composition to analysis, and find that the ingredients are well blended, and the mixture neutral. If it is used according to the directions given, I feel satisfied, that while it effectually destroys vermin, it will not injure the hair roots (or "yolk") in the skin, the fleece, or the carcase. I think it deserves the numerous testimonials published. I am, Sir, yours respectfully,

WILLIAM HERAPATH, Sen., F.C.S., &c., &c.,

To Mr. Thomas Bigg, Professor of Chemistry,
Leicester House, Great Dover street, Borough, London.

He would also especially call attention to his SPECIFIC, or LOTION, for the SCAB, or SHAB, which will be found a certain remedy for eradicating that loathsome and ruinous disorder in Sheep, and which may be safely used in all climates, and at all seasons of the year, and to all descriptions of sheep, even ewes in lamb. Price FIVE SHILLINGS per gallon—sufficient on an average for thirty Sheep (according to the virulence of the disease); also in wine quart bottles, 1s. 3d. each.

IMPORTANT TESTIMONIAL.

"Scoulton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your invaluable 'Specific for the cure of Scab in Sheep.' The 600 sheep were all dressed in August last with 84 gallons of the 'Non-Poisonous Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continued getting worse. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your Specific proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use. I remain, dear Sir, your obedient servant,
"For JOHN TINGEY, Esq.,
"To Mr. Thomas Bigg." "R. RENNEY.

"Beware" Flockmasters would do well to beware of such preparations as "Non-poisonous Compositions;" it is only necessary to appeal to their good common sense and judgment to be thoroughly convinced, that no "Non-poisonous" article can poison or destroy insect vermin, particularly such as the Tick, Lice, and Scab Parasites—creatures so tenacious of life. Such advertised preparations must be wholly useless, or they are not what they are represented to be.

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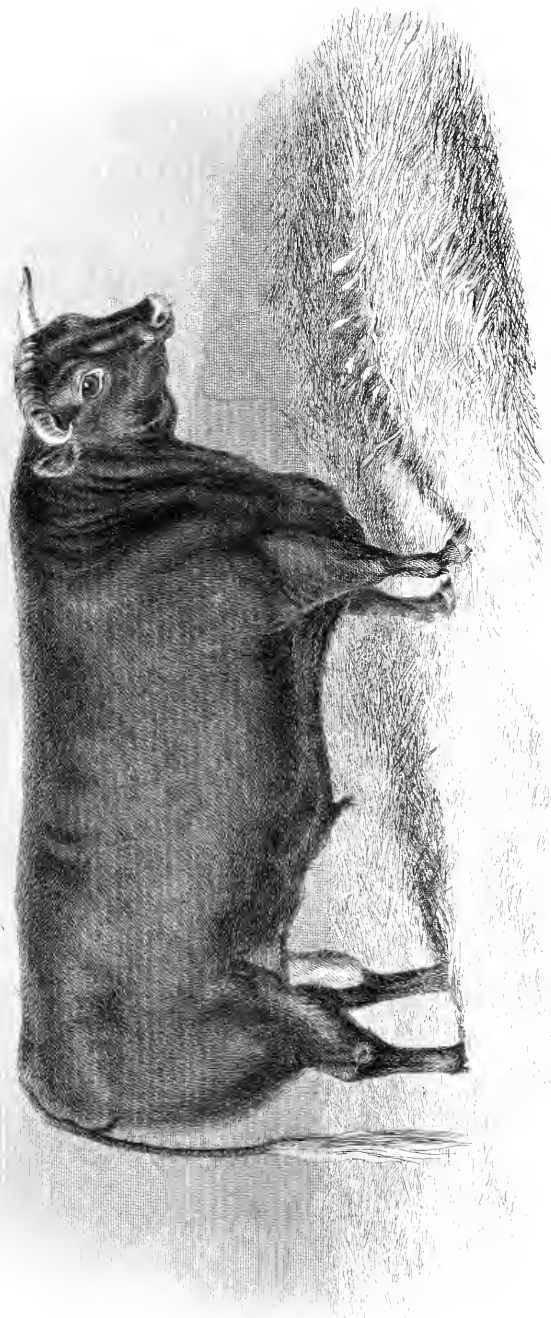
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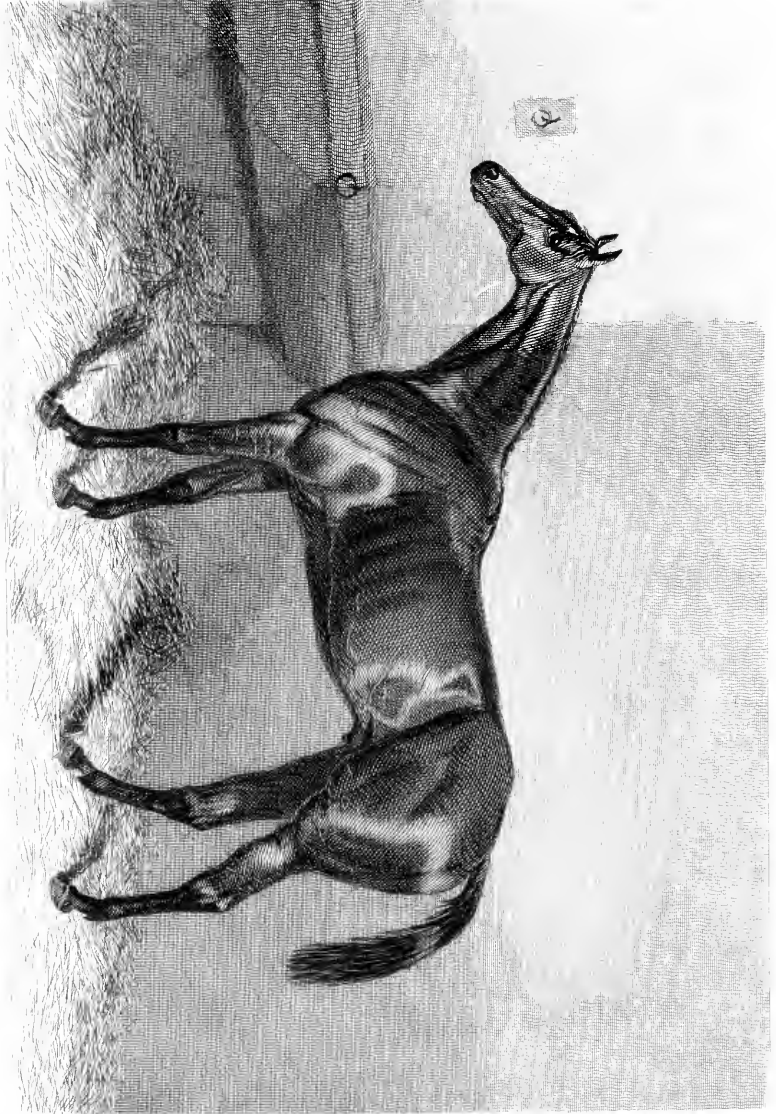
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THE FARMER'S MAGAZINE.

NOVEMBER, 1865.

PLATE I.

SOBIESKI; A PRIZE DEVON BULL.

THE PROPERTY OF MR. JOHN SOBEY, OF TREWOLLAND, LISKEARD.

Sobieski (728) bred by Mr. Sobey, and calved on October 13th, 1860, is by Duke of Chester (404), out of Brown (1196), by Alfred (138), her dam Beauty (29), by Duke (30)—Famous (163)—by Watson (129)—Pretty Maid (366)—Curly—Old Curly. Curly and her dam were considered by Mr. Francis Quartly to have been the two best cows he ever bred.

Duke of Chester (404), bred by Mr. John Quartly, and calved in 1857, was by Australian (365), out of Prettymaid (367), by Baronet (6),—Pretty Maid (366),—Curly. Duke of Chester took a first prize at the Chester meeting of the Royal Agricultural Society, and hence his title.

Brown (1196) was also bred by Mr. John Quartly, and calved in 1854.

In 1863, Sobieski, as the property of Mr. Sobey, took the second prize at the Liskeard meeting of the East Cornwall Society; and the first prize at the Truro meeting of the Royal Cornwall Society.

In 1864, Sobieski took the first prize at the Liskeard meeting of the East Cornwall Society; and was officially declared by the judges to be the best of his class at the Salt-ash meeting of the Royal Cornwall Society; but he was excluded from com-

petition in consequence of coming a few minutes too late on to the ground. In the same summer he was highly commended at the Bristol meeting of the Bath and West of England Society.

In 1865, Sobieski took the first prize at the Falmouth meeting of the Royal Cornwall Society, and the first prize in the all-aged class at the Plymouth meeting of the Royal Agricultural Society of England.

There was a deal of discussion over the Liskeard award in 1863, the majority of the spectators contending that Sobieski should have been first; and Lord Clinton's Baronet, placed before Sobieski at Bristol, received only a high commendation when they met again at Plymouth. We here spoke of Mr. Sobey's bull as "a very handsome, thick, square animal, with plenty of size to back his breeding"; and he won very handsomely in a class that was generally commended. Sobieski was never forced when young, and never had a dose of physic but once in his life, and that was at Bristol, when he took a chill on that bleak Durdham Down. He is a capital stock-getter, and Mr. Sobey has some very promising things by him coming on, that no doubt will be heard of at Liskeard and Falmouth, if not even at another Royal show.

PLATE II.

GLADIATEUR;

WINNER OF THE 2,000 GS. STAKES; THE DERBY; THE GRAND PRIZE OF PARIS; AND THE ST. LEGER, 1865.

Gladiator, bred by Count Lagrange at his stud farm at Dangu, in Normandy, in 1862, is by Monarque out of Miss Gladiator, by Gladiator, her dam Taffrail, by Sheet Anchor—The Warwick mare, by Merman—Ardrossan.

Monarque, bred in France in 1852, is by The Baron, Sting, or the Emperor, out of Poetess, by

Royal Oak, her dam Ada, by Whisker—Anna Bella, by Shuttle—by Drone. Monarque's name is already familiar to us on this side of the Channel, as in the Count Lagrange's colours he won the Goodwood Cup in 1857, and the Newmarket Handicap in 1858; while he is the sire of Beatrix, Fornarina, Infante, Villafranca Gedeon, Hospodar,

Le Maréchal, Brioche, Le Mandarin, and Rothomago, all winners in England.

Miss Gladiator, bred by M. Aumont, and purchased at his sale by Count Lagrange, is out of Taffrail, a mare sold by General Peel to Count Waldstein, who shipped her for Germany in 1853, but subsequently transferred her to France with a number of others that M. Aumont took in a lot. It may be as well here to correct an error which has appeared in some of the sporting papers as to Taffrail having been bred by General Peel, whereas she was bred by Lord Wenlock, and claimed by the then Colonel Peel for a couple of hundred after winning a plate at Newmarket.

Gladiateur is a bay horse with black legs, standing close upon sixteen hands and one inch high. He has a big, plainish, but sensible head, well put on to a beautifully arched neck, and this again fitting into powerful well-inclined shoulders, backed by muscular arms and thighs, with good depth of girth. He is, however, light in his back ribs, and has but a middling loin—the weak place in his conformation—while he rather droops in his quarters, and, with plenty of bone and substance, has two suspicious-looking enlargements on the fore fetlock joints, but which, being the result of accident

and not of work, are of no actual detriment. As we said when we saw him in the paddock, the most thoroughly furnished horse of the lot, and got fit as he never was got before, with the great hard muscle starting out all over him, Gladiateur, even here carried everything before him. Indeed, with his steady, resolute, business-like air and a straight free walk, he was “almost” a grand horse; as seldom or ever has one been more thoroughly prepared.

Previous to the St. Leger an objection was lodged against Gladiateur as not being of the right age, but the stewards refused to entertain it.

The Count Lagrange certainly deserves his triumphs, from the spirit with which he has gone into the business of racing, as on his stud farm at Dangu there are now five stallions, forty brood mares, thirty-six yearlings, and thirty foals, with sixty more horses in work at Royal-Lieu and Newmarket. There is thus plenty to pick from, and with some of the best blood in the world to breed from, and the finest climate in the world to breed in, it would be strange if our French friends could not now and then bring out a clipper; as they most assuredly have done in Gladiateur, a long way the best horse of his time.

THE SHORES OF NORTH DEVON.

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

It was in September of the present year that I had the pleasure of exploring the glorious shores of North Devon—an iron-bound coast, deeply interesting in all seasons, but still more lovely in such brilliant sunshine as that of September. As I expected, I met many well-known farmers from different portions of our island—agriculturists who have, owing to the difference of climate and soil, to practise other systems of cultivation than that followed by the men of Devon. We all agreed, however, in the conclusion that no portion of our country was more worthy of an autumn's tour than the district between Clovelly and Lynmouth. If the traveller commences at Clovelly, he will be struck, as he approaches this little fishing port, with the long, densely-wooded drive of two miles, made by Lady Williams, and which, like Clovelly itself, is formed on the sides of the fine cliffs which overhang the sea. The closeness of these luxuriant woods to the salt water will not escape his attention, or the success with which they withstand the sea-spray.

The farms of North Devon, especially between Bideford and Clovelly, the tourist will find small, and chiefly devoted to grazing. The moisture of the climate, in fact, is opposed to the extensive cultivation of corn, but well adapted to that of the grasses and roots.

It is not, however, on the table lands of Devon—such as those which occupy the twelve miles between Bideford and Clovelly—that the visitor must seek for the beauties of this great county. Let him spend a few hours, when at Bideford, in exploring the valley of the Torridge—let him mark well the scenery of that of the Taw, as he glides down the North Devon Railway; that of the ten miles' stage between Barnstaple and Ilfracombe; and, above all, the valleys of the East and West Lynn—bright mountain torrents, which roll down from Exmoor Forest, and, amidst the boldest of rocky beds and dense woods,

mingle their waters at Lynmouth. Let the agriculturist from our eastern or midland counties select a bright day for his visit, and he will never feel tired of wandering amid such scenery.

Most of the waters of the streams flowing from Exmoor Forest possess, like those of the East and West Lynn, a slightly brown tinge. These moorland waters were alluded to by Mr. Robert Smith, when he was describing the hill-side catch-meadows of Exmoor (*Jour. Roy. Ag. Soc.*, vol. xii., p. 139). He observed that in changing his residence from the east to the west of England his attention was naturally directed to the agricultural practices of the neighbourhood, which he found so directly opposed to those of his native county—Lincolnshire. On reflection, he adds, “I found that it was climate alone which dictated these opposite methods: thus, while our dry districts had their foundation in the growth of corn, the humid districts of the west had their merit in the production of roots and grass, and consequently of stock. Nothing could exceed my admiration of the ‘water meadows’ in early spring, a period (in the east) when I had been wont to value a blade of green grass as a rare production. To see the Exmoor ewes with their early lambs feeding (in January) upon the verdant meadow to me was a miracle—first, the early period of lambing, and secondly, the green meadow at such an inclement season. But if we turn to nature as our guide, we find the green grasses ever springing at the water's edge, and yet doubly verdant at the spring, even to the very summit of our forest hills, at an elevation of 1,000 feet. Thus these practices of agricultural art are dictated to us, and are alone waiting the skill and enterprise of man to cultivate and extend them. In my early inquiries as to the profitable formation of ‘catch meadows’ on Exmoor, I found much importance attached to the quality of water for irri-

gation, the general remark being that 'warm springs' were found best for irrigation. Experiments were therefore instituted; and these went to show that the waters flowing from the wet, peaty hill-tops, and joined (or not) in their course by the waters from the uncultivated valleys, were dangerous agents; while in every case where proper drainage had been practised the water flowed in a pure and healthy state, and at the stream's side were to be seen green and improving grasses."

The breed of Devon cattle will not escape the continued attention of the visitor. Their bright red colour, their graceful shape, their handsome small heads, their light and nimble step (and they are nearly all alike) distinguish them from all other of our several valuable breeds of cattle. The North Devon cattle were well described by our friend Robert Smith, of Emmett's Grange, in Exmoor, a few years since (*Jour. Roy. Ag. Soc.*, vol. xix., p. 368), as having been "long recognized as one of the earliest English breeds. Even in 1808 they are mentioned in 'Vanconver's Report of the Farming of Devonshire,' 'as an important breed of animals, active at work, and their aptitude to fatten unrivalled.' Their natural locality is around North and South Molton; but, verging away from this neighbourhood in every direction, more especially to the eastward, where we find the Wiveliscombe and West Somerset classes of Devons, they then merge into other breeds, or are changed by climate and circumstance. The true type of the 'old Devon' is peculiar to North Devon. Here they have long revelled in their bracing, yet humid air, where nature clothes them in early autumn with dark curly coats, well adapted to their native home, at the foot of the Exmoor mountain range.

"They were amongst the earliest breeds to be removed from the home of their fathers; but they did not enjoy themselves on distant soils in equal ratio with other breeds, especially when destined to consume artificial food for the purposes of a corn farm; yet, as converters of vegetable into animal food—breed against breed—they were found to return as much per acre, or for weight of food consumed, as any other breed.

"The Devon steer is described even from early times as being much sought after by the graziers and dealers from the midland and south midland counties. Vancouver states (1808) that the Devons were then declining in their general standard of excellence and numbers. He traces it to 'the great demand which has been made for these cattle from other parts of England, where the purchasers (Mr. Coke and others) spare neither pains nor price to obtain those of the highest proof and beauty.' Great merit is due to the late Mr. Francis Quartly, of Molland, who perceived that the best animals were being drawn from their native soil, and systematically purchased the choicest cows he could procure. Mr. T. D. Ackland, in his 'Report of the Farming of West Somerset,' makes honourable mention of Mr. Quartly's patriotic and successful exertions. About the year 1831, cattle shows began at Exeter. Some good Devon breeders carried-off the early prizes; but in November, 1835, Mr. Quartly allowed his nephews to enter in all the twelve classes at Exeter, and they brought home the twelve prizes. In the previous year, Mr. Quartly gained eight prizes out of ten."

The butter of North Devon is large in quantity, and excellent in quality: it is commonly made in a way rather different from that of the dairies of other counties. I was sometime since obliged to a North Devon farmer's wife for the following account of their dairy management. "Cows are milked twice a day, morning and evening, and the milk strained into the milk pans, which are generally made of tin, and should not be too deep, or the milk will not cool quickly. Early the next morning (as soon as the

fire has attained a sufficient heat) the milk is placed on the stove or steam apparatus, to be scalded, beginning with the previous morning's milk until all is scalded. There should be from 12 to 15 pints in a pan, and, with a proper heat, it will take from 20 minutes to half an hour to scald. When it is sufficiently scalded you will see the cream look rough, and a ring or mark will appear on the surface just the size of the bottom of the pan. After scalding, the milk is placed in the dairy to cool; and on the following morning the cream is taken up from each pan with a skimmer, and placed in a large bason, where it remains until it is removed into the tub, to be made into butter. In the summer butter must be made every day; in the winter three times a week will be sufficient. When you make butter you must pour off any clear or thin cream there may be in the bottom of the bason, and then put the thick cream into your butter tub; stir it with your hand, or with a stick, round the tub, all one way, until it becomes a very thick substance; continue turning it until you see milk coming from it, then pour off the buttermilk and wash well the butter with cold spring water until there is no milk left in it, and the water is quite clear; then add a little fine salt to make it a proper saltiness, wash it again, and continue working it with the hand or stick, as may be, until you cannot get a drop of water from it; then weigh the butter and make it up into pounds. If this plan is strictly followed your butter cannot fail to be excellent. In very hot weather the morning's meal of milk must be scalded in the afternoon, and the evening's meal early the following morning, to keep it sweet. The stick used in our dairy, and which is preferable in every respect to the hand, is formed like a small spud, with the handle about 12 inches long. When the red earthenware pans are used for the milk, it takes nearly an hour to scald each pan. We consider tin pans preferable, for two reasons—first, economy of time in the dairy work; second, the milk in hot weather is less likely to turn sour when quickly scalded."

The elouted or scalded cream of North Devon every tourist will remember. It is made by warming the milk about twelve hours after it is taken from the cow. It is an erroneous opinion, that by scalding, a larger amount of cream and butter is obtained. The effect of scalding is rather to reduce the amount obtained than otherwise. Neither is there any difference in the composition of the butter obtained by the two processes. The practical advantages of scalding cream are, that the butter is quickly made by stirring with the hand or with a stick, and that it keeps much longer.—*T. D. Ackland, ibid.*, vol. xi., p. 735.

The visitor to Exmoor will hardly omit to notice its breed of active and hardy ponies, whose quality has been much improved of late years. Here also let Robert Smith of Exmoor be heard. He says: "The mountain pony is an indigenous animal peculiar to our mountain ranges, whereby the rough grasses are turned to account, which would otherwise decay and be lost. The original pony has been much improved. The native pony of the New Forest in Hampshire was enlarged and improved by the presence of 'Old Marske' amongst them; the Exmoor pony, by an infusion of the English thoroughbred and Dongola horse; the Welsh pony has been crossed with the Norwegian; the Dartmoors are nearly extinct; the Highland pony is still the old hardy animal nature formed; the Shetland pony of the northern Scottish isles is still diminutive, but beautiful. The infusion of larger males amongst the old mountain race has increased their bulk, while their pony form and hardy constitution have been preserved. The severity of winter-storms drafts many an inferior animal from this larger breed, leaving the breeder to reflect on the inevitable operation of nature's laws. The galloway is indeed a treasure when well pro-

duced. The first cross from the pony mare with a small thoroughbred horse is generally the real animal for safety, quickness, and endurance. There is ample record of the wonderful performances of this class of animal, either for the field, the road, the park, or lady's carriage. The best are graceful indeed. Being a galloway breeder myself, and to some extent from the Exmoor pony mares, I have taken the opinion of a first-rate judge as to the qualities required in them. He writes to me—"I wish you to breed some galloways (a few to begin with) of the following kind: long, low, and full of quality; deep shoulders, light necks, and small heads, with large nostrils and hawk's eyes, for which I will give £120 each."

Besides the ordinary farm and artificial manures generally used, the farmers of North Devon employ to a large extent the calcareous sand of the sea-shore. This sand is either carted up the steep roads leading from the sea, or in those places where the incline is too considerable, it is carried on the backs of doukeys on to the top of the cliffs, and from thence is carted inland to considerable distances. This use of sea-sand, which we noted in several places in North Devon, becomes more extensive towards the west—not only in Devon, but in Cornwall, where even a railway was long since constructed, chiefly to convey the sea sand of Padstow harbour into the interior of the county. This sand, as Mr. Tanner observes (*ibid.*, vol. ix., p. 469), is found on several parts of the coast of Cornwall, but North Devon is chiefly supplied from the neighbourhood of Bude, where it forms a large bank on the sea-shore of considerable length; and although many thousand tons are removed every month, no decrease is observable, the loss being restored on the return of the following tide. This sand forms the principal article of traffic on the Bude and Launceston Canal, depôts being established on its banks for supplying the district through which it extends. By a microscopic examination it appears to consist of the

fragments of common coast shells, amongst which are oysters, scollops, cockles, and muscels, with the spines of sea urchins. These live between low tide and thirty fathom water, and are therefore readily brought under the influence of the breakers. On arable land it is generally applied at the rate of from eleven to thirteen two-horse cartloads per acre, before ploughing for wheat. It is a valuable manure for grass land, and produces a sweet and luxuriant herbage. The rotation chiefly adopted in this county is known as "the old Devon course," viz., turnips, wheat, barley, oats, seeds, two to six or more years. It is climate, indeed, that ever materially influences the mode of cultivation. Thus, as Mr. N. Whitley remarked (*ibid.*, vol. xi., p. 38), a summer temperature of from 54 deg. to 59 deg. includes the degree of heat best adapted to the oat. Where the temperature exceeds 59 deg., barley is grown on suitable soils. In the moist climate of Ireland ten acres of oats are grown to one of other corn. In Devonshire excellent crops are grown at Exmoor, 1,000 feet above the sea, yielding 60 bushels per acre. On Dartmoor, at 1,100 feet, oats answer well, the harvest being about a fortnight later than on the low lands. The wheat plant often suffers by the mild wet winters of Devonshire. The plant is kept in a state of excitement during a mild February and March, only to be cut down by a frost, or injured by a north-west wind. In the spring a continuance of warm moist weather produces a great bulk of long flaggy straw, which is laid by the westerly gales, or by a few showers of rain.

The agriculturist, then, who from drier and consequently better corn-growing lands, wends his way into North Devon, will long remember the scenes he has visited. He will, as soon as he looks out from the Castle Hotel at Lynton, arrive at the rapid and correct conclusion that he is in a land full of beauty, and where health and deeply interesting objects on all sides abound.

THE DEATH OF LORD PALMERSTON AND THE CONSEQUENCES.

The death of the Prime Minister of England when holding office is an event of such rare occurrence as of itself to create a sensation. Ranking as only next to the sovereign in public importance, the loss of such a personage is at once acknowledged. For Lord Palmerston, however, the feeling is a far deeper one, as he was not only the most eminent, but at the same time the most popular man in England. So happy a combination of good qualities it has seldom been the fortune of humanity to possess; for with all his really hard work in office, with all his increasing years, and his grave responsibilities, the Premier was the most cheerful and genial gentleman of his day. As with good wine, age but served to improve him, and it was only as he ripened that the world came to recognise his real excellence. Lord Palmerston, to be sure, might have adroitly suited himself to circumstances as the occasion required, but whether as Foreign Secretary or first Minister, he had ever the most jealous regard for the honour of his country; he might have despised the solemn bearing of the mere prig, who endeavours to look as wise as an owl and know as much, but never in act or thought was he deficient in true dignity; and, if the foreigner feared him, his own people loved him, because he was at heart as in manner so genuine an Englishman. At his decease, as for long previously, no one carried so great a sway. The very tact with which he managed his own Party gave the Cabinet the confidence of the country;

and if ever the welfare of the State depended upon an individual, this was the case with Lord Palmerston.

Such a fact only serves to emphasize the loss of so successful a man, as it suggests the continual changes which may be the consequence. With Lord Palmerston removed from the face of it, the political world appears to be split up into almost innumerable sects and coteries, without the name of anyone offering itself as likely to command so incongruous a company. Even confining our reference to those at present in power, it is well known that Lord Palmerston's influence and discretion have alone kept the Ministry so long together. We have brilliant orators, plodding economists, rising young statesmen, and well-trying veterans; certainly neither genius nor experience is wanting in our emergency, but that which we do need is some one with weight enough to follow the late Premier. Putting his general popularity out of the question, is there anyone with sufficient power, even amongst his fellows—anyone who can reckon upon the support that must make and rule a Government? In any private circle half-a-dozen people would most probably propose as many different candidates for the office, and throughout the country there would seem to have been an equal uncertainty. Want of position, want of temper, or want of executive ability, have alike been urged against the more prominent members of the present administration; while, from the other side, Lord Derby is more

than loath to again going very actively into harness, as neither Mr. Disraeli nor Lord Stanley has quite the sympathies of his associates, and the democratic dominion of Mr. Bright is still in hazy perspective.

The deduction to be drawn is surely inevitable. The secret of the last long Parliament was simply Lord Palmerston. A new House, whose constitution was more or less a compliment to the man himself, will meet to meet a new leader. Whatever may be its leaning, from a purely party point of view, at a time when the divisional line of party has almost faded out from amongst us, the majority was essentially the Premier's own. And Fate has now delivered this over to the hand of another. Rarely has there been a greater or more direct responsibility. The Old Guard, hampered possibly with many a raw recruit in their ranks, miss the hearty greeting of their old General, and fall in to the cold word of command from another Captain.

We would wish in no way to disparage the services or experience of Lord Russell, to whom Her Majesty has been pleased to entrust the delicate business of forming a government. But the new Premier does not start fairly. The House of Commons, wherein he himself figured so long and so prominently, and where of course the actual power centres, is not of his calling. The chief officers of his Cabinet may even not be precisely of his own choosing, but the rather remain, as he may continue them, through a time of passing difficulty. The result, then, we repeat, may be surely anticipated; or at any rate it is a duty to advise the country to stand prepared. There is little probability of another long Parliament; on the contrary, Lord Russell would be justified in a dissolution on the first embarrassment he may encounter. The very antagonism of

personal interests or prejudices may conduce to such a difficulty, to say nothing of the renewed energy with which the Opposition will now lay siege to office. There were few bold enough of late to bid for power against Lord Palmerston; but there are many who will give freer bent to their ambition, now that he is removed. In such a state of transition, when the country is watching the conflict and directing the storm, the pressure of any question of common justice and general good may be put with more and more effect. Let the farmers look up their representatives closer than they hitherto have done. Let there be no mistake as to the course of action honourable gentlemen are going to take on behalf of the agricultural interest. We may rest assured that other classes will be alive to the occasion, whether it be the Reformers after Lord Russell's own heart, the extreme outsiders who have Mr. Bright for their champion, or any other particular set of citizens with a grievance to get righted. Never did a Government promise to be so susceptible to attack, or, in nicer phrase, so open to reason. A Chancellor of the Exchequer with Lord Palmerston at his back might afford to pooh-pooh a petition for the repeal of the malt tax, knowing as he did the centrifugal force that would carry him through. But he feels that he can count upon this no longer, as that his tenure of office may depend upon the good-will of a deputation of country-farmers; that is if the farmers are so far true to themselves as to select representatives in which they can trust. The death of Lord Palmerston is a national loss; but still under the shadow of his name many an eccentric piece of legislation was thrust upon the country by his colleagues, who will now have to study the requirements of the people rather than to humour their own peculiar fancies. Even a Budget can be no longer a mere series of surprises.

SPEAKING TO THE POINT.

It is an encouraging sign to see the way in which the business of agriculture has been spoken to from the high table during the autumn. In Shropshire, to be sure, the scared Squires fairly run for it, when the after-dinner debate takes a really practical turn; whilst elsewhere the landlords and M.P.'s have been the first to direct the discussion into a more profitable channel. Thus at Docking, last week, we had Lord Leicester manfully broaching many of the topics that farmers have at heart, and, as we must do his lordship the justice to say, without trimming his own opinions to suit those of his audience. For instance, after all that has so recently occurred in the county, the Lord-Lieutenant still holds to his own views on the Malt-tax, as that "were the duty repealed the poor man's wife could never brew beer, and the money spent in the attempt had far better be employed in the providing of other luxuries or comforts for her husband's home." However unpalatable such a sentiment may be to some of the barley-growers of Norfolk, or however ready many might be to dispute such premises, the manner in which the speaker courted rather than avoided so ticklish a question testifies of itself to the honesty of his intentions, and we are prepared accordingly to follow him with increasing respect. It was only last week, indeed, that, as fitting in so well with the subject we were dealing with, we had to quote Lord Leicester on the rating of woodlands and preserves, and he referred quite as forcibly to another matter, in which by way of properly adjusting his burdens the farmer is equally interested, as his lordship pointed the argument

by example of his own immediate district: "I must now congratulate this union as being the only union in this country which has adopted that wise measure of a union settlement, and of having given a precedent to Parliament for passing an Act which will do more to benefit the labourer than any other measure that has been hitherto attempted on his behalf. Up to the present time our duties and interests have been apparently antagonistic. I say apparently, gentlemen; because we had begun to learn that unless we provided proper cottage accommodation for our labourers within a reasonable distance of their work we were likely to lose the services of our best labourers. We also considered that it was better to open our close parishes, and be subject to provide for the aged and infirm, rather than to depend upon the supply of our labourers from the distant and open parishes. That the evils which existed under the old law can be immediately remedied is impossible. Before the Act that was called the New Poor Law was passed, there were certain parishes on this estate that paid 19s. in the £ poor-rate. Certainly at that time, if it was not the duty, it was the policy and interest of owners of property to endeavour to diminish the population and not to increase the cottage accommodation. But railways and other causes have entirely altered the position of the employers and employed. But after all that can be done or has been done by Parliament or by societies like this, the physical and moral improvement of the labourer must mainly depend upon his landlord and upon his employer." The value of such a declaration from such a quarter can scarcely be over-

estimated, the more particularly when we remember the opposition with which Mr. Villiers' Bill was met by the Knightleys, the Bankes Stanhopes, and the country gentlemen of that school, aided and abetted as they were by good old Mr. Henley, who did all they could to prevent "the passing of an Act which will do more to benefit the labourer than any other measure that has hitherto been attempted on his behalf." We have this, be it borne in mind, on the word of one of the great landlords of England, and who has himself a more intimate acquaintance with the condition of the rural labourer than perhaps any other man of his order. Lord Leicester did not make a long speech, but he made a very good one, which we give at length in another column; and that, however much or little we may agree with him on certain points, cannot fail to do good. It is wholesome, after all that has happened, to see anyone of so much position, instead of leaving the room when it really came to business, the first to follow up every argument, whether this turn on thatching a rick or framing an Act of Parliament.

But Lord Leicester is well matched from the other side, as unquestionably two of the best, or, in other words, two of the most useful addresses of the season have been delivered by Mr. Disraeli. It was the wont of some small wits to refer at such a time to the right honourable member for Buckinghamshire in his famous impersonation of the British farmer; but bringing the force of his genius to bear upon the character, it is certain that few have studied the part with more success. Mr. Disraeli backed his speech at Aylesbury by another equally good at Amersham, the other day, when he touched upon a variety of topics, though on none with more effect than the share which the labourer should claim in such celebrations:—"I have not changed my opinion as to the expediency of rewarding long service by a pecuniary donation; and although that has been a subject of considerable controversy, I know, as you all do, that this is a recognition of merit which the men substantially appreciate. And so long as the labouring classes associate with them the feelings which they do at present, it would be most unwise, and give rise to great and painful misconception, if we were to terminate them. Recollect, you must estimate the value of a reward of £3 to a labourer in proportion to his income: £3 to a labourer with 12s. a-week represents a sum equivalent to £500 or £600 to a gentleman with £5,000 a-year. Now I have observed that gentlemen in the receipt of £5,000 a-year are not absolutely indifferent to the chances of receiving £400 or £500 extra. Why the income-tax, about which the gentlemen with large incomes make such a noise, does not amount proportionately to anything like the sum which is obtained in addition to his income by one of the agricultural labourers whose moral virtues and whose industry are recognized by this system of rewards. With regard to the other prizes, there can be no controversy. Careful shepherds, industrious ploughmen, skilful hedgers and thatchers—as we have in the southern part of the county, though you have not here—why should not their merits be recognized by those amongst whom they live? There is another point touching the condition of the labouring population which this and similar societies have attempted to influence—I mean their habitations. You offered pre-

miums for keeping cottages in good order, for the cultivation of gardens with the greatest industry and taste, and in other modes sought to encourage a feeling of the respectability of home among the labouring poor. Gentlemen, that is an excellent object; but there were, I believe, domestic difficulties connected with the inspection, which have thrown obstacles in the way of the continuation of the prizes for the best-kept cottages. But generally the premiums offered by this and similar societies for the cultivation of cottage gardens have been productive of much good." This is all very excellent, avoiding as it does any injudicious extreme—either the austerities of the Bedford authorities, who would allow of no public recognition of long service and good conduct, or the absurdities of the Kingscote officials, who would set down a ploughman to pen prize essays. Premiums for the cultivation of gardens or allotments should be as useful as similar distinctions for farms, crops, or cattle; but we should hesitate, with Mr. Disraeli, as to offering prizes for well-kept cottages. The privacy of the poor man is too often invaded already, and with a prying curate and a busy body Lady Bountiful for judges we can picture nothing much more offensive than such an inspection. The member for the county had also of course something to say to his constituents, and Mr. Disraeli followed up a subject it seems already started, with all that good common sense he brings to bear upon the actual business of life, however eloquent he may become when the occasion requires:—"It is very well to say a farmer ought to have a lease; but you must consider the terms of that lease, and you will find, when you come to discuss these terms with one who would be your tenant, that very different ideas are attached to these conditions from those which are entertained by another. Mr. Field said a farmer should have a lease or tenant-right; but a lease and tenant-right are two very different things. Mr. Pusey was one of the best authorities on this matter who have flourished in our time, and to his proposition, with regard to tenant-right I was always favourable. I remember hearing him say in the House of Commons—although he was a man to whom agriculture and husbandry are more indebted than to any other man in our generation—that rather than let land on long leases, he would refer to have no land at all. The fact is, the arrangements under which land is held must vary according to the soil and customs of different counties. I do not think any abstract principles can be laid down on the subject. But this is quite clear, that permanent improvements ought to be done by the landlord; and if that be done, there are very few tenants, I think, who would wish to embarrass themselves with leases." And yet in the face of all this, with the fact before us that the best cultivated land in the kingdom is farmed without leases, we hear every now and then of Mr. Pusey and his labours being derided by some unknown upstart, whose sole object is to push himself into notice, and to advertise for customers. Arrangements must vary according to the soil and customs, while no general principle has yet proved sounder or worked better than the Lincolnshire Tenant Right. It would be impossible to frame a model lease adapted to all districts; but the system of compensation for unexhausted improvements might be made everywhere applicable.

THE GAME QUESTION—MR. BRIGHT'S LETTER.

With Mr. Clare Sewell Read *in* for Norfolk, and Sir Baldwin Leighton *out* for Shropshire, we have every precedent for some further reform in the constitution of the House of Commons; while it is self-evident that any such change will tell mainly against the country gentlemen. If the member for the county will remain supine as to the Malt Tax and obstinate as to the Game Laws, his fate can only be a question of time, as even the interest of a Lord Lieutenant will not be able to keep such a man in his place. The world is fast coming to see this, and the Press is just now circulating a letter throughout the length and breadth of the land, urging the adoption of such a course as the only way of mitigating the many evils consequent on the excessive preservation of game. To be sure, the writer is Mr. John Bright; but then his communication is addressed to a Farmers' Club, the members of which have sought the honourable gentleman's advice under a difficulty that is getting past endurance. Mr. Bright goes to the point with little or no hesitation: "There is one thing which the farmers may do for themselves, whenever an election for a county takes place. At present they are not asked who shall pretend to represent them, but the lords and squires of the county name the candidate, and, as a rule, the tenant-farmers vote for him, and he enters the House to do the work of the lords and squires who selected him; a main part of that work is to keep guard over the laws which favour the preservation of game. The time is coming when tenants will dare to believe and act for themselves in the performance of their political duties. They can combine with great ease, and when combined their power is irresistible. I hope the day may soon come when they will take the election of members in the counties in some degree into their own hands, and when this is done their political and social deliverance will be secured." There can be no possible dispute as to the truth of all that is here stated, or as to that future for the farmer, should he be driven to taking his case into his own hands. At the same time, it must be remembered that such an exhortation does not come with the best grace from Mr. Bright. Since the promises they made to the producer on the repeal of the corn laws, what have the Free-trade party done for the agriculturist? As a body, or as Mr. Bright in particular, nothing whatever. They have the rather held carefully aloof when any rural matter has come on for consideration, as the real object, even here, is palpable enough. With all his well-practised ability Mr. Bright would most probably have turned almost any other question round to precisely the same answer. To obtain any relief you must join with us in what we are going for—a democratic House of Commons. "I see only one way in which any real improvement can be made. It can only be done by having in Parliament a larger number of representatives of the people, and fewer representatives of a class, and of the prejudices and usurpations of a class. How can this be brought about and secured? By the admission of another million of the people to the elective franchise, so that the House of Commons may become truly representative of the true interests and wishes of the nation." This is manifestly the panacea; and Mr. Robotham, who introduced the subject at the meeting of the Midland Farmers' Club, appears to be very much of Mr. Bright's way of thinking, taking the letter indeed from which we have quoted

as "the best conclusion to his paper." But the other members of the club could scarcely go so far as this, and after some discussion which is reported at length in this number, wound up the business of the evening by passing, as it strikes us, a very sensible resolution, which was: "That this Club desires in the most emphatic manner to call attention to the serious losses which are being inflicted upon tenant farmers in many localities by the excessive preservation of game, and to the necessity that exists for a general and earnest appeal to be made to landed proprietors in order to induce them to take immediate steps to mitigate the evil." Now who is to decide here? Mr. Bright says the main work of "the gentlemen" is to keep guard over the game, and that what we must go for is the repeal of all laws made with the object of favouring the preservation of game. The farmers, on the contrary, confine their complaint to the excess of game maintained, and the necessity for this being immediately reduced. Again we ask, who is to decide between the two sides, the ultra and the moderate party? But the very wording of the resolution suggests an arbitrator; and this one must be the landlord himself. For the present, at any rate, the question is left in his hands. Will he take immediate steps for lessening the losses inflicted upon his tenants by this monstrous system of game-preserving? Let him not shrink from the point for a moment. It is simply idle to talk of compensation or valuation for damage done, for all practical men know how utterly impossible it is to estimate this. Let the lord declare at once, the rather by his deeds than by his words, if he will be content henceforth with fair sport instead of sheer slaughter. If he will, the farmers will be the first to go with him; and that such a plan can be carried out was shown at this very meeting by one of the land agents present, Mr. Bigge, who acts for Lord Wenlock, and who made by far the most effective speech of the evening; in the course of which he said "he had thought a good deal on that subject; and as he happened, he was glad to say, to be in a position to try an experiment on the question of game as between tenant-farmers and landlords, he immediately set to work to put it in force on some estates in Shropshire which he had the honour of managing. The first thing he did was to discharge all the game-keepers on the estate. Having done that, at the audit-dinner he mentioned to the tenant-farmers what he had done, and he was glad to say it met with their full approval. At the same time he intimated to them that the landlord was fond of shooting; that he wished to reside on his estate, and wished to live in amity with all his tenants. They one and all said they were certain they would preserve more game on that estate than the keepers did. At the same time they had liberty to destroy, at every season of the year, by ferrets, but not to shoot on their farms. With this they were quite satisfied. This year there was an exceedingly good shooting season. Instead of killing 250 brace in a week's shooting, nearly 400 were killed. That was a practical proof of what tenant-farmers, if they were treated in a liberal, straightforward manner by their landlords, would respond to." We have ourselves urged the adoption of such a system over and over again; while as some further proof of how the straw is shaking we may refer to the speech of Lord Leicester at Docking on the day following, and who, though hitherto a heavy game preserver, thus expressed himself: "There has been lately a very

wise and proper readjustment of the rates of our respective parishes, but there are certain descriptions of property that I think are unwisely exempted from being rated. I see no reason why the 2,000 acres of wood that I hold in this county—retaining them as I do for the purposes of game or ornament—all of which, if converted into pasture or arable, would be subject to rates, should not pay their quota to the poor-rates. This law was established years ago for the purpose of encouraging owners of property to plant timber for the purposes of the Royal navy, and when the reasons for that encouragement ceased the exemptions which were derived from it should have ceased also. I do not think that it would be right to value the woodland property at the same rate as the lands adjoining. That land has been brought up to its present state of value by skill and capital. The land that is under wood should be valued according to its natural value if converted into land for agricultural purposes. It has been argued that it would be by no means desirable to alter a law so as to encourage the destruction of our wooded districts. The love of sport and the desirable appreciation of ornament that exists in all Englishmen's breasts is such that in my opinion there would be no danger of any material decrease of the woodland districts of this country. The difference that would be made in the rate would be comparatively inappreciable; but it would remove an act of injustice, and it would prevent that feeling of discontent which I can quite understand exists in the breasts of many of those who are not the owners of this description of property." Now if, after such warnings on all sides, the Squire will still have his bands of keepers and watchers, and his three or four great days in a season, then we trust that the occupiers will go dead against him. The argument is rapidly coming to such an adjustment; as, we repeat, the landlords must decide for themselves, remembering as they do that the power is not quite all now in their own persons. There have been two or three

very awkward examples of late, and example is catching, and may be easily multiplied by another election. If the hares are to continue to eat up the tenant's produce, if he is still to suffer from the offensive surveillance of the keeper, and that preposterous paragraph of the killed and wounded is still to go its annual round, then we say that the farmer's course of action is clear enough. Let him temporize no longer with those who simply ridicule his remonstrances, but let him set about and do with all his heart all that Mr. Bright advises. Select, as he says, "a farmer's candidate," and he will be the popular one, as has already been proved. "The Liberals in the towns will give him their support, and you will carry him into Parliament to do the work of the farmers and people, instead of that of lords and squires." Or again, "Get absolute and undisputed ownership of and control over all animals which live upon the produce of the land. You can do much. You can do everything for yourselves—and there will be a revolution that will transfer the county representation from a dozen rich men or families to the real people of the counties." This reads harsh in comparison with the resolution passed by the members of the Midland Farmers' Club, but it is still the only alternative. Are the landlords, the so-called "sportsmen" of this country, open to reason? If so, here is their opportunity. If not, if they will still blindly persist in inflicting injury on an important class, and in wasting the food of the people, their sin must be on their head. They are putting a weapon in the hand of the enemy, and working their own downfall. But it will not be the first instance in either ancient or modern history where overbearing excess and absolute injustice have brought the Patricians to grief, and this democratic House of Commons hangs like a drawn sword over their devoted heads as they heedlessly sleep on in self-satisfied security!

HOW IS THE FARMER TO FIND CATTLE TO CONSUME THE CROP OF ROOTS?

When the first drought set in at the beginning of May, and it was necessary to sow the turnip fields over and over again, apparently to no purpose, great fears were naturally entertained that there would be a scarcity of winter food for the cattle and sheep. The hay crop was in many places not worth harvesting, and, in fact, so scarce was the feed on the pasture lands that what little grass there was, was eaten up to keep the stock alive. The rain set in at the latter end of June, and dissipated the fears of the farmers for the time. Both the turnips and the mangolds sprang up, as if by magic; whilst the meadows and upland pastures, which had hitherto yielded the most scanty produce by the first cutting, gave promise of a plentiful after-grass, which has been so far fulfilled. But the drought set in again, and arrested the root crops in their growth; and in the end the turnips and swedes showed symptoms of mildew, and the early ones of a stunted growth. Fortunately, before these drawbacks had attained any great height, so as to injure the plants irremediably, rain again came to the relief of the farmer, and a fresh growth was instantly apparent, even where the mildew seemed to have taken the strongest hold. Generally speaking, on the good land the plant is ample, and the late sown turnips will in all probability prove a good crop. We have both seen, and made inquiry of farmers in different parts of the country, and they all agree that there will be a fair crop both of turnips and mangolds, as well as a good produce of grass on the pastures.

Another difficulty, however, now presents itself, totally unprecedented and unlooked for, namely, how the farmer is to find cattle to consume the produce? We have seen several during the last fortnight who are precisely in this predicament, having a first-rate crop of roots, but not cattle enough to eat them; and in the present state of the cattle market, they are afraid to purchase any, under the apprehension of introducing the fatal disease into their herds. Unless therefore the approach of winter puts a stop to the pest, the root crops will be of little avail as food; most of the farmers being in the same condition in respect to the want of stock and the fear of purchasing. In the mean time healthy lean stock are selling at prices that will afford no profit upon grazing, unless the price of meat advances still higher than at present, which, in fact, appears the most probable result of the state of things. It will scarcely, however, be prudent to speculate upon this contingency, as the importation of fat cattle and sheep from the continent may be so much increased, *for the moment*, as to keep down the price of meat at market. The continental graziers cannot enlarge the number of cattle they export, *upon the average*. It is true, we have already seen that the price of meat in England has stimulated the trade during the last few months; but they cannot continue to do so, especially under the rigid restrictions to which the importers are now compelled to submit.

The destruction of the London dairies by the disease will make a sensible difference in the demand for winter fodder

and roots this season. Some of the largest establishments have been completely broken up, and the proprietors have wisely determined not to renew them by purchase whilst the disease is so prevalent. London is at present, in consequence, chiefly supplied with milk from the country, and it is not improbable that in future this mode will be *the rule*, if the country dairymen continue to supply good milk, and it does not get adulterated by the retailers. This novel state of things, we repeat, will materially lessen the consumption of both hay and straw as well as of roots in the metropolis, which will occasion a serious loss to the farmers in the vicinity, who have hitherto found a ready and constant sale for all they produced. With regard to the root crops, a large proportion of which will probably be left over in the spring, the best mode of disposing of them—where the covenants will not allow of their being removed from the farm—will be to chop them up and plough them in, when they will rot and furnish an excellent manure for the barley crop. This plan has been adopted by many farmers who have found their root crops too large for their live stock to consume, and where they

were not allowed to sell them off the farm. And when the high price of lean cattle, with the addition of the risk of losing them by the disease, is taken into the account, perhaps this would be the most profitable method of disposing of the surplus, especially when straw also is scarce, and not more than will suffice to supply the limited number of cattle that are held by the farmers.

Altogether, this will be one of the most trying seasons the farmers have ever experienced; and in many cases it may be attended with utter ruin. On the good lands the white crops turned out an average; but on the light soils the wheat crop proves terribly deficient, both in quantity and quality, and will involve a heavy loss to the grower. On the other hand, the cattle plague, which may decimate the herds both of cows and oxen, admits of no relief, in some cases the grazer not having a single animal left. It is to be hoped that the approach of the cold season will arrest this insidious disease; but in many cases the plague has done its work, and left but little room for congratulation on its cessation.

T H E P I G .

The pig, sow, or swine does not claim such a very high antiquity as the horse, ox, and sheep, the first notice occurring about 1,500 years before Christ, when the flesh was strictly forbidden as food by the Jewish legislators. The Mahomedans copied this interdiction, almost the only prohibition in respect of food. Swine are mentioned partially by the Greek writers, and the flesh was very largely esteemed in the early declining days of the Roman Empire. The nations of Northern climes have ever made a large use of swine, as the temperature allows the flesh to be treated in the proper manner. The filth of the animal may have caused the prohibitions against eating the flesh, which has descended to modern times in the aversion of the Jews, Egyptians, and the followers of Mahomed. Yet vast herds of swine have been reared in these countries, probably for the purposes of gain, and in order to supply strangers and the neighbouring idolaters; and the keepers or swineherds were considered as in the lowest possible state of degradation. The northern parts of Greece being cool in the climate, may have first used the flesh of swine as food, and broken the prohibition, which must have been carried along with the people from Egypt, from which country they emigrated.

The pig has been found as a native in the greater number of parts of the known world. The European varieties are all referrible to the wild hog of Switzerland, which inhabits the moderate elevations of that Alpine country. The wild boar (the "*Sus scrofa*") of naturalists, var. "*Aper*") is of a dusky brown or iron grey colour, inclining to black, and diversified with black spots or streaks. The body is covered with coarse hairs, intermixed with a downy wool. These hairs become bristles as they approach the neck and shoulders, and form a kind of frame, which the animal erects when irritated. The head is short, the forehead broad and flat, the ears short, rounded at the tips, and inclined towards the neck, the jaw armed with sharp, crooked tusks, which curve slightly upwards, and are capable of inflicting fearful wounds; the eye full, the neck thick and muscular, the shoulders high, the loins broad, the tail stiff, and ended with a tuft of bristles, the haunch well turned, and the legs strong. The strength of the animal is great in proportion to the bulk, and fierceness grows with the age. The habit is neither wholly solitary nor very gregarious; the animal chooses dark abodes, and near to pools or streams of water in woods or forests. The instinct is herbivorous, and the choice feeds upon plants, fruits, and roots. Reptiles and small insects of the ground are devoured by swine, but flesh is not eaten in its proper state, putrid carion is relished, but much discrimination selects the herbs of the earth. The sense of smell is very acute, and also of

hearing: the former induces the furrowing of the ground by the snouts in search of food, for which purpose the organ is very powerful. The hearing perceives distant sounds more readily than the noises that are close to the animal. The sense of smell and touch is exquisite, and resides in the snout, by which the animal is enabled to discover roots for food, though buried in the ground. Swine are employed to hunt for truffles, and the digging with the nose marks the place where the mushrooms may be found, and also gave the first idea of ploughing the ground. The pig was the first ploughman, the snout giving the idea of the coulter.

The wild boar is a very active and powerful animal—fierce and most dangerously savage. The fierceness increases with age, and is retained in the improved domestication in a considerable degree. The animal is viviporous, and the female produces but one litter in the year, which consists of several individuals, carries the young for 16 or 20 weeks, and suckles them for several months. She defends her progeny with exceeding courage and fierceness when attacked; but neither the boar nor the female are very aggressive, but enjoy a kind of solitary savage majesty in lonely retreats. When disturbed or attacked the animals quickly show the mighty power with which Nature has endowed them, outrunning very fleet horses, keeping dogs at bay, resisting the spear of the hunter, sometimes killing both horse and dogs, and endangering the life of the horseman. Hunting the wild boar has been a favourite sport in almost every age of recorded antiquity. The allusions are many in the Greek and Roman classical writers; and the animal formed a large part of sports, pageants, and shows of the fading days of Roman grandeur. During the middle-ages the European countries continued the amusements of boar hunting; and the animals contributed a part of the furniture of the feudal domains in forests and parks. The breed disappears before the increase of population; and the barbarous pastime had ceased by the time of the Commonwealth in England. The wild animal is now chiefly found in Alpine Germany, and the hunting mostly practised in British India.

Swine appear to form an intermediate link between the whole-footed and cloven-footed animals in some respects, and in others to occupy the same ground between the cloven-footed and the digitative; but in any point of view these animals present various peculiar characteristics, and one of vast importance, as affording a large means of sustenance to the human race in all parts of the world. The pig is a perfect cosmopolite, adapting itself to almost every climate, increasing rapidly, easily susceptible of improvement, and quickly reaching maturity.

Zoology places swine as under :

Division	...	...	Vertebrata
Class	...	...	Mammalia
Order	...	...	Pachydermata
Genus	...	...	Sus, or suide
Species	...	...	Sus domestica, or domestic fowl.

The hog has fourteen molar teeth in each jaw; six incisors, and two canines, curved upwards, and commonly called "tushes."

Swine do not ruminate or re-chew the food, and belong to an order called "pachydermata," or thick-skinned animals, which includes the elephant, rhinoceros, hippopotamus, &c.

The *sus* family, or *suide*, comprehends, under the latter generic term, several animals, as the peccary, babirerissa, the placo, chaene, and the capibara, which resemble the hog, pig, or *sus* of common understanding. These animals are exotics, and the pig only is known in Europe. The feet are cloven, and have two toes behind that scarcely touch the ground; the incisor teeth variable in number—the lower incisors projected forwards, the canines projected from the mouth, and recurved upwards; the muzzle terminated by a truncated snout, strongly fitted for turning up the earth; the stomach but little divided; body square and thick, more or less covered with bristles and hairs; neck strong and muscular; legs short and thick. All this species feed on plants, and especially on roots, which the snout enables them to grub from the earth; they will devour animal substances, but scarcely hunt or destroy animals for the purpose of devouring them. They are thick-skinned, obtuse in most faculties, except in smell and hearing, voracious, bold in defence, and delight in retired, shady, and humid places. The animal is generally regarded as stupid, brutal, rapacious and filthy, intractable, obstinate, dull, and unwieldy—low in the scale of organization, but highly useful to the purposes of man. The natural age varies from 15 to 30 years; but the improved purposes seldom allow an age beyond two years. Geological research finds the fossil remains of swine included in the quadrupedal era of the globe among the diluvial deposits that contain the horse and ox and the other mammals of the vertebrated division of animals. In point of antiquity the pig fails only in the records of the early patriarchal ages, where the notice falls below the mention of the horse and the ox. The diminutive size being unfitted for draught might not attract so much attention as the larger animals; and the aversion or prejudice so early entertained to its filthy habits might continue the neglect of this species of animals.

All the breeds of swine have been obtained by the effects of external influences, and of the selected propagation from the genus of animals called *sus* (or hog), the species *sus aper* (or wild boar), and the variety *sus domesticus* (or the tame swine). No animal is more sensible of the effects of soil and climate, and none has yielded a more varied progeny from the same original stock. The common origin is easily discovered, as the natural instinct of the animal never in any case forsakes it.

The pig or sow is reckoned a filthy animal—heavy, dull, and stupid, and low in the scale of organization; the bulk is unwieldy, and the general appearance unhandsome. Though this character may be true, the redeeming qualities are many, and sufficient to overbalance the estimate of disadvantages.

The animal is multiparous, and produces a numerous offspring, that are healthy and strong, and easily reared into maturity. The accommodation required is simple and not costly; the food is various, and not restricted to any quality; the flesh is more generally useful than that of any other animal, being palatable and nutritious in the fresh condition; and, as it is easily cured by taking the salt better than any other animal flesh, the use is very large among the working population, for naval stores, and among the articles of maritime states. The skin and the bristly hairs are made into saddles, coverings of books, and into brushes, and into the pointed ends of shoemakers' threads; and the bones are crushed into manure. No animal is more useful to the purposes of man, and none is so readily adapted in the forms and qualities to suit the varied affections of the globe.

Every variety of swine inherits the prolific quality which produces a numerous offspring that is most abundant in the wild or unimproved kinds of the animal. The first litter is less numerous than the following births, which succeed each other as rapidly as natural faculties will allow. The number

of young is large, and the animal is provided with an ample milk vessel and many teats, in order to accommodate the suckling progeny. This property imparts a very considerable value to the pig, as useful animals of the farm, the number compensates for the want of bulk, and the comparative little trouble encourages the domestic utility of the animals. The young are soon weaned into maturity, the growth is quick, and the delicacy is less exposed to accident than in any other quadrupeds that are bred and used on the farm. Pigs are in every respect much less costly than the other fattened produce of the farm, with the exception of poultry, which are wholly different in the nature and arrangements. The very destructive habits of swine render necessary a strict confinement of the animals; but the seclusion is less individual than of the other quadrupeds, and the attention required is not so great. Hence arises the minor consideration that has been almost universally bestowed on swine, till the evidence that the comparative value has compelled a notice of some corresponding degree.

The pig may not be indigenous to the British Isles; but the animal was noticed by the earliest writers as a wild beast of the chase, of which the extinction is uncertain in point of date. The pig had been domesticated when records began to be made of agriculture, and is described as a useful animal of the farm. The best lowland hogs were large in bone, long in the limbs, low in the shoulders, and narrow and curved in the back, uniting every objectionable point, and totally devoid of any approach to symmetry. The shape was most uncouth, and the face almost wholly hidden by the long slouching pendulous ears. The animals consumed much food, and fattened slowly; but the prolific quality produced a numerous progeny, which were nursed with a profusion of milk. Many varieties of this general and sole description of swine had appeared in the descent from the wild hog, as each locality of soil and climate had formed to itself a breed which bore the permanent marks of external impressions. Domestication multiplies any species of animals into many varieties, after it has obtained a full and complete influence. Variety in the feeding and management, the selections of particular forms for the purpose of breeding, in order to gratify fancy or caprice, and the crossing with other and sufficiently allied stock, are the chief circumstances that concur in producing the many differences of domesticated animal life. The larger quantity of food in the tame condition induces many changes in the animal frame, the eagerness for food is increased, and the tendency is developed to the secretion of fat, and of general obesity. The habits are changed from nocturnal prowling into feeding by day—the desire of liberty ceases—the body is enlarged and distended laterally—the ears not being required to catch distant sounds, as in the wild condition, decrease in size, and become less movable; the tusks of the male, no longer needed for self defence, vanish from sight; the muscles of the neck are much relaxed, and are less developed, and the head is seen to be more prone, or looking downwards; the limbs become shorter, less muscular, and less suited for active motion. Along with the form of their bodies, their whole habits and instincts are completely changed. The very wild fierceness is lost, though a degree of voracity remains: the animal never again becomes the wild hog after domestication. A new condition produces a new set of creatures; the natural quality of great propensity to devour food, to enlarge the carcase, and to secrete fat, operates most powerfully, and wholly changes the original production.

The changes which thus occur in the form and characters of the animal, from the alterations of the condition in which he is placed, are not of a superficial or evanescent kind. The degree is so great as to become strictly permanent; the impressions are so lasting as to distinguish breeds and varieties; and if the term "species" was applied to indicate the differences of form alone, the domesticated hog would be said to be specifically distinct from the wild one. The number of teeth varies with the external agents which affect the animals, from six incisors in the wild state to three in the tame condition, both in the upper and under jaw. In no other animals does this effect happen, the number of teeth being constant in every condition. The tail almost disappears in several varieties of domesticated swine, and the vertebrae differ very much in number.

The changes that have been mentioned reduce the hog into many breeds and varieties after the characters have assumed a certain degree of permanence, and no domestic animal so easily receives the impressions that are wished to be affixed. This

quality is very much facilitated by the rapid powers of increase, and the constancy of characters which are transmitted to the progeny. No animals are so easily improved by breeding, and so quickly rendered suitable to the required purposes. As with cattle and sheep, the same marks of external form indicate the early maturity and the propensity to fatten. The body is large in proportion to the limbs, or the legs are short in proportion to the body; the chest is broad, the trunk round, and the extremities are not clogged with coarseness. These essential points always indicate an early maturity and a fattened condition, with less expense of food than when a different conformation is possessed. The entire general appearance of the domestic hog indicates a strong tendency to fatten and to accumulate flesh.

When the great improvements in agriculture commenced in Britain about a century ago, pigs were observed among other articles of the farm, and the alteration was entertained to be done by the same rules as in the case of the other domesticated quadrupeds. By this period of time the changes that have been mentioned had silently and gradually produced many local varieties of swine from the original domestication of the wild hog, some possessing very good qualities, others only middling, and many were still very deficient. When the eye of observation looked abroad in quest of materials with which to amalgamate the best existing properties of swine, an ample store was found for selection, and of very similar analogies that could be easily blended. Skill and judgment were applied to the consorting of similar and not very distant properties, which being persistently continued, a new race was produced, which was stamped with the better qualities by the regular propagation. The accidental productions of Nature, which exhibit superior properties, are many in swine, from the very abundant progeny, and consequently a larger field of quicker action afforded than with other animals, where progeny is less frequent and numerous, affording fewer opportunities of selection and continuation. The inferior grade of importance that has ever been attached to pigs, attributed less notice to the animal than to the other quadrupeds; fewer minds were occupied with the business of improvement, and the results were not so much regarded. Chance and accident had, as usual, a chief sway in the management, and ended in the stray productions of a capricious and neglected direction. Accidental productions were used as chance found or fancy made the application. Changes were done without being directed, and good properties were obtained without the wish or intention. In this way, improvement progressed, and materials were provided for the future advancement.

It was soon perceived that certain forms of pigs attained an earlier maturity, and fattened more rapidly than others of a different shape; and that a certain quantity of food had a greater effect, in the way of maintenance, with the animals that possessed the former properties. Judgment selected these animals for the purpose of propagation, with the view of obtaining a perpetuity of properties that were seen to be so valuable. The frequent and numerous progeny of the pigs very quickly and amply showed if the practice adopted was correct, and if the desired properties were continued in the wide and general developments, if the inferior qualities of the more numerous progeny were relinquished, and the good properties retained of the fewer number that had been selected to propagate. The very great adaptation of swine to circumstances had been observed and meditated, which is beyond almost any other animal of domestication.

During the progress of improving the swine of Britain, much advantage was derived from the foreign breeds of Naples and China, which countries had secured a variety that possessed several points of excellence, as the delicacy of flesh was produced in warm countries. Coarseness of form was the great fault of the native swine of England, and the consecutive aptitude to arrive at an early maturity of flesh and fatness. The mixture of the Asiatic blood has everywhere tended to correct this defect, it has much lessened the size, and probably the power of producing a numerous progeny. The flesh of the Eastern hog is particularly tender and fine in the grain; but it is suited for the small and fresh pork of the table, rather than for bacon. The quality of the flesh is very readily transmitted to the posterity, and this faculty strongly recommended the use of the swine in Britain. The native pig of China is delicate, and very sensible of cold—the value lies in the intermixture with more hardy races, which

has been attended with most beneficial results. The form of the Chinese pig is not handsome: the body is long and trailing, back sunk and bending downwards, and the hams thin. The delicacy of the flesh is the chief and almost only excellence; with the very prolific nature in producing young, both numerous and frequent.

The pig of Naples is black in colour, and without bristles—but which grow in this country—the leg of medium length, the body square and cylindrical, exhibiting a symmetry much beyond any other variety of swine yet found in a semi-reformed condition. The flesh is very good in quality; but the animals are not hardy, and are little adapted for general use. The crosses with British swine have been very valuable, the progeny showing much fineness of form and aptitude to fatten. Much benefit has ever accrued from the use of the swine of Naples, as it possesses the most valuable adjuncts of bulk and quality.

The continued and progressive improvements in the breeding of swine in Britain have led to the formation of three distinct varieties or kinds of animals—the large kind, the middling sort, and the small size—all of them derived from the same source, and fashioned in the present condition according to the elements used in the propagation, and the maintenance that has been afforded. The fancy of the breeder and the local use of the peculiar articles of consumption, not to omit the powerful influence of chance and accident, have contributed to fix the varieties of swine in the particular places of residence, and the adaptation of the animal organization to the soil and climate have continued the propagation of the kind of swine, with little intrusion, since the time of the settled production of the permanent marks of excellence. Modifications do exist, as in all other matters, either organic or inert. The nature is as extensively varied as in other animal organizations, and the variations are as large as there are influences of producing circumstances. But very evident tendencies are seen to exist, which incline the arrangement of the animals in some one of the three distinctions that have been mentioned—a majority of qualities, of which the bulk is the chief mark, is sufficient to indicate the degree of position in the kind of swine, and to fix the standard of its merit. Though every point of improved excellence is not present, the prevailing appearances never fail to exhibit the relation which is possessed by the animals, and also the scale of merit that has been reached. In reaching the highest perfection as yet attained, very many intermediate productions have appeared which support a very valuable character, and occupy a position the most profitable for general use. All minor grades that have been somewhat elevated by the higher improvements are very widely spread, and form the most numerous class of swine in Britain, following in the wake of advancement.

The large improved breed of swine has been produced by propagating from the best specimens of the old English hog, by persevering in the judicious selection, and most powerfully assisted by the altered circumstances of maintenance and domesticated accommodation. Confinement in sheltered abodes, along with an ample supply of food, changed from the scanty gatherings of the forest and the field into prepared meals from grains and roots, very soon effected great startling changes in the whole conformation of the body of the hog. The narrow erectness of the back was depressed into nearly a level extent from the head to the tail; the ribs were much curved outwards, and largely increased the lateral extension of the carcass; the snout was shortened, and the long pendulous ears were very much reduced in size. The widening of the body brought it nearer to the ground, shortening the legs, and expanding the frame. Domestication has produced effects on the organization of swine almost beyond any other animals that are used for the purposes of man, in the size, form, and colour. The variations are numerous and very different. The visible marks of the parent source still remain in the large swine of England. The colour is mostly white, passing into black through many gradations of varied colours. The size is also of different bulks, the carcass very clearly evincing to what designation the animal belongs among the breeders of swine. The modifications of the breed are not many, as a reduced size quickly passes into the middling variety, and an enlarged bulk still retains the stamp of the large breed. The station is very clearly occupied, and most easily discerned.

The large hog of the present day exhibits an animal carcass

of very considerable symmetry, allowing for the natural unwieldy bulk of the pig, and the inelegant form. The back is still rounded, and the sides flat; the head is depressed, and the ears slouch forward. The length of carcase suits the purpose of large salted meat, and the width of body adapts the flesh for salted hams of large size. The depth of ribs adds to the value of the carcase, as it favours the width of the flitches of bacon. As in large bulks of every kind, the symmetry is inferior to smaller forms, and the quality of the flesh is less delicate, and not so agreeably-tasted.

The sows of the large breed are very prolific in bearing young, and suckle them well with an abundance of milk. These two very valuable properties have been transmitted from the primeval source, and are inherited by the progeny in a degree beyond all other breeds of improved swine in Britain. Other deficiencies are very much compensated by these two qualities, which are banished by the very extended refinement of the organization, but which may be retained in a fair degree in the improvement of animals of every kind.

The best specimens of the large breed occur in the secondary bulks of carcase, which show the utmost symmetry of that variety of pigs. The rounded back, depending belly, and flatness of rib bear ample testimony of the descent from the old English hog; while the small head, full cheek, width of ham, and shortness of leg and ears very strongly attest the large improvement that has been made from the uncouth source of production. The huge bulk overpowers the strength of leg, and prevents the due exercise for the proper discharge of the animal functions, and the consistence of the flesh, which, however, only happens with the very largest sorts. The quantity of inside offal is large, but not disproportioned to the bulk of carcase, while the exterior offals are not larger than in other improved breeds of swine. The proportion of meat to the bulk of carcase is probably superior to most varieties of swine; the bone is small in a very fair degree, and refined as far as seems to be just and proper.

The large breed of pigs, in the most bulky carcasses, is confined in comparatively few possessions, and rather diminishes in public estimation. The breed recedes before the middling-sized swine of the next description of which the largest sort mingles, and is much confounded with the smallest variety of the heavy breed. The largest purposes of hams and bacon are suited from the most bulky carcasses of the middling breed, which very much encroaches on the large variety, and entails the peculiar utility. Bacon and hams of the largest size are the only valued productions of the heaviest breed of swine: the use is more in the small pork of delicate flesh in the young or half-grown condition. The general preference entertains a number of carcasses rather than very heavy weights, and delights in smaller forms of compact shape and neat symmetry. When these properties are attended with the purposes of the heaviest bulk, which has now happened in the largest sort of the middling swine, the advantage does not appear of pushing the growth into a very huge bulk of animal carcase, and somewhat smaller bulk answers the purpose, and only requires to be enlarged in the number of individuals.

The middling sized breed of swine is the most extensively used variety, and justly esteemed on the most incontestible grounds of preference. The sort of pigs has been obtained from crossing the best shaped medium bulks of the improved English hog with the Neapolitan boar—the very remarkable lateral extension of the carcase has been got from the foreign animal, with the shortness of leg and delicacy of flesh. The colour of this variety is white when the old English hog has had most influence in the production, and black when the Neapolitan blood has been more employed. The black pigs exhibited a greater likeness to the foreign animal than the white kind, which confirms the above observation that the blood has been more largely employed. The hair or bristles are more wanting in the black, and more abundant in the white variety, which further shows the former to be more Neapolitan and the latter more English in the descent. The truth is quite evident from looking at the different animals. Both colours rank as middle-sized swine, however the pigs may be bred; if the sources of descent be different, the continued propagation has ended in the same result of producing and fixing a variety of swine that remains yet altogether unequalled.

The breed of middle-sized pigs possess the unequalled advantage of affording in the young condition the delicate article of suckling pigs, and of fresh pork in the maturity of young growth. The most advanced fattened age yields hams and bacon of a sufficient size, which excludes the use of the large breed of swine that has been described. The flesh is much more delicate of the present breed than of the last-mentioned; a greater number of the animals can be kept on the same quantity of food, and the fattening process is more quickly finished. The prolific quality is very fair, and sufficient to maintain an ample propagation; a limited number of healthy young is preferable to a numerous unhealthy offspring. The milking property is also very sufficient for the nurture of the offspring; no hurtful disproportion attaches in any way to the variety of pigs, and a greater use attends the breed than is found in any other British swine. The animals are found all over Britain, in various colours and proportions; the size is the mark of discrimination, whatever may be the colour, particular shape, or supposed pedigree. Very many localities have forged a breed of this denomination of its own name, which all sink into one general character as now distinguished.

In this most useful of all the varieties of British swine, the body is of rather long dimensions, straight, and looking square from every point of view. The back level and wide, with a great lateral extension of ribs, which are full, and not flat, with a straight belly from the hind udder to beyond the fore feet, and touching the fore legs. The head of a medium size, ears more than half erect, and tapering, snout short, eyes not too deeply sunk, cheeks full, and shoulders wide. Legs of medium lengths, and strong to support the carcase; tail of medium thickness, and once twisted; hams deep, wide, and covering well to the knee; outside of the hams not quite flat, nor protuberant, but upholding the level line of the sides of the carcase.

(To be continued.)

FATTENING ANIMALS IN A HURRY.

We have pointed out in former years the futility of attempts to lay heavy masses of flesh on poor cattle by stuffing them with rich food. Such attempts not only prove to be failures, but are always wasteful. The material consumed is nearly lost, the animals remain comparatively poor, and the owners are convinced that fattening animals for market "don't pay."

It is perhaps well for the cause of good management that all neglected treatment of animals should result in loss to the owner. If he has starved his cattle, sheep, and pigs for a year or more, he cannot atone for it by sudden attempts to push them to fatness. On the contrary, the only true way is to see that growth continues without cessation, summer and winter, from the earliest period of their existence till they are finally sold in market. A single check given to this continued progress may arrest or retard it for months. Our own observations lead us to the opinion that the whole profits resulting from

raising and fattening, when this continued progress is kept up by careful, regular, but not extravagant feeding, are at least triple the amount realized from early neglect and heavy feeding afterwards—and often the difference is many times greater than here stated.

There is nothing that should be more strongly impressed on the mind of the young farmer who makes the feeding of animals a prominent part of his business, than the importance of keeping up an unremitting growth throughout the whole course of their existence. The most successful pork-raiser, with whom we are acquainted, adheres strictly to this course; not only feeding his store pigs well and regularly through fall and winter, but commencing the fattening not merely in autumn, as is too commonly the case, but *early in the spring*.

It is objected that this management is too expensive. This objection is urged by those who find two or three months only

to consume more than they can afford. They feed heavily for a short time, but do not receive a corresponding return of increased flesh. "If two months' feeding," they inquire, "costs us so much money, how can we ever afford to continue it for two or three years?" It is very true they cannot, because the whole system they adopt is a profitless one. Fortunately it does not require heavy feeding to keep up the continued growing condition of animals. Here is a great error into which many have fallen, which we have endeavoured to correct. John Johnson made the remark some years ago that the copious feeding of grain or meal to cattle is no better than a moderate amount. We gave the statement some years ago of experiments performed by G. H. Chase, of Cayuga, who carefully weighed every week all his fattening animals. A daily supply of four quarts of barley meal to a fine steer gave a weekly increase in weight averaging eighteen pounds. A neighbour advised him to *push* him, and eight quarts were accordingly fed daily. The weekly increase of flesh was less than when he received four quarts. The amount being increased to twelve quarts per day, he gained nothing at all. Several similar instances have come to our knowledge, and among others a fine animal was recently fed by a neighbour a

peck or more of rich meal per day. After thus urging on the fattening process, as he supposed, for several weeks, he was finally sold, and proved to be only a few pounds heavier than when purchased. The many bushels of feed which he had consumed, and the labour of attendance given him, literally went for nothing.

Successful feeders, who prove all their experiments by weighing, have long since ascertained that animals in fine condition will lay on more flesh for the amount of food eaten than those of inferior character. Hence shrewd men will not purchase lean and raw-boned animals for fattening. This fact serves to establish the truth that all animals at all stages of growth should be kept fleshy. It need be scarcely necessary to remind any intelligent manager that the difference between attending to all the comforts of an animal by cleanliness, good wholesome food given regularly and in moderate quantity, and neglecting all these particulars, is simply the difference between those in fine healthy condition and such as are feeble and raw-boned. It may be laid down as true, with scarcely an exception, that the farmer who carries on the business of fattening at a loss, is one who neglects at one time and over-feeds at another.—*Country Gentleman (American)*.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

PUBLIC MEETING IN LEICESTER.

On Monday, Oct. 16, a public meeting was held in the Castle, to consider the propriety of inviting the Royal Agricultural Society to hold its meeting, in 1867, in this town; to open a subscription list; and take such other measures for the promotion of that object as might be deemed expedient. The attendance was very limited. Among those present were Lord Berners, Sir F. Fowke, Sir W. de Capell Brooke, Mr. C. W. Paeke, M.P., Alfred Burgess, Esq. (mayor), Mr. W. Miles, Alderman S. Viccars, J. Underwood, E. S. Ellis, Councillors C. Harding, J. Shenton, J. Sarson, R. Angrave, and J. Crow, Messrs. T. Burgess (Wigston), W. Chamberlain (Desford), T. Willson (Knaptoft), and Revds. H. J. Hoskyns, E. Elmhirst, and others.

On the motion of Mr. Paeke, Lord Berners was unanimously elected to the chair, and the following resolutions were passed:

Mr. C. W. PÆKE, M.P., proposed: "That this meeting having heard with much satisfaction that the Royal Agricultural Society of England intend to hold their annual exhibition, in the year 1867, in one of the midland counties, it is hereby resolved that a deputation from the town and county of Leicester do wait in due course upon the council of that society, and request them to select Leicester for that purpose; and, in the event of their so doing, that this meeting pledges itself to use its best endeavours to give the society a hearty welcome."

The MAYOR seconded the resolution, and it was carried unanimously.

Rev. E. ELMHIRST proposed: "The corporation of Leicester having offered to the society that most eligible spot, the Race-course, this meeting recommends the local societies to forego their cattle shows, in case the Royal Society visits Leicester, and urges upon the committees of such societies the necessity of appropriating their funds, in the year 1867, in aid of the sums required by the Royal Agricultural Society."

Alderman E. S. ELLIS seconded the resolution, which was carried unanimously.

Mr. G. NORMAN proposed: "That a subscription list be at once opened at the various banks in the town and county, for the purpose of providing funds to meet the conditions of the Royal Agricultural Society."

Mr. Alderman HARRIS seconded the resolution, which was carried unanimously.

Major FREER moved: "That the gentlemen form a committee, with power to add to their number, for the purpose of carrying out the foregoing resolutions, as well as to act as a deputation to the council of the Royal Agricultural Society,

and to take such further steps as they may deem necessary for the foregoing object."

Mr. S. VICCARS briefly seconded the resolution, which was carried unanimously.

Sir F. T. FOWKE proposed that the best thanks of the meeting be given to the high sheriff of the county; also to his lordship, for his able conduct in the chair.

Mr. W. MILES seconded the resolution, and it was carried unanimously.

His lordship and the mayor having acknowledged the compliment, the proceedings terminated.

WHERE FAT AND FLESH COME FROM.—They come from the earth and the atmosphere, collected by vegetation. Grass contains flesh; so grain. The animal system puts it on from these. Vegetation then is the medium through which the animal world exists; it can exist in no other way. When grass or grain is eaten, the flesh constituents are retained in the system; so also the fatty substance, that is the starch and sugar, from which fat is made. Some grains have more flesh than others; so of the qualities that make fat. In a hundred parts of wheat, according to Piesse, are ten pounds of flesh; in a hundred parts of oatmeal nearly double that amount. Hence oats are better for horses, on account of their flesh-forming principle, rather than fat, as muscle is what a horse wants. For fattening purposes, however, corn and other grains are better. When flesh itself is eaten, the system but appropriates what is already formed, but would as readily take it from vegetables, from flour. The flesh-making principle—or the flesh itself, in its constituents—goes to form cheese in the dairy; the starch, &c., butter. Hence it is that some people assert that cream has little influence in cheese, farther than to enrich it; for cheese and butter are entirely distinct. The same kind of food is equally good for the production of either. This is a point of considerable interest, and is not yet fully explained—indeed, it is yet in its infancy. And a plant in its different stages of growth has a different effect. The fat of the plant is held in reserve for the seed; nothing is wasted in leaves, wood, &c.; the precious seed must have it. Hence, when this takes place, the stalk is comparatively worthless to what it is prior to the change. And the fat cannot be appropriated so well in the seed as when it is diffused through the stalk. Tender herbage, therefore, is the best; and when secured before the direction of the oil takes place, so much the better will be the hay.—*Rural World*.

MECHANICAL BRICK AND TILE MANUFACTURE.

According to the oft-told story, the manufacture of brick is nearly coeval with the industry of the human race. The question has even been raised as to whether the ancient Chaldeans, Egyptians, Greeks, and Romans were not better acquainted with the art in their time, than are the inhabitants of Western Europe at the present day? That they (the former) had attained to a very high proficiency in the art is manifest, for the buildings which they have left testify this to modern times. That we have many advantages over them in a mechanical sense is unquestionably true; but when the quality of the bricks and tiles of the two periods are placed in the scale, this shows the balance in their favour rather than the contrary; so that a practical question naturally arises for solution, viz., have we profited as we might or should have done by our superior machinery? or have we allowed ourselves to fall behind both in this and also in other respects?

A better style of agricultural buildings is much needed, and also brick-walls for fences, &c., and this in many localities involves cheaper and more durable bricks than are now made; and these two conditions, cheapness and durability, on the other hand, embrace all the most improved mechanical appliances that can be brought to bear upon their manufacture in the brick-field, and also the best method of burning, together with the best quality of clays, &c. The subject thus divides itself into two practical problems, the one mechanical, and the other chemical. In this paper we shall confine our observations to the former—the mechanical question of tile and brick manufacture.

Much of the machinery that is now generally used in the manufacture of bricks is of the simplest character, the working apparatus and stock, upon perhaps the majority of brick-fields, being of the rudest mechanism, the whole bearing a close resemblance in many respects to what was in use in ancient times. For the most part, the inventory consists of a pug-mill, an old horse and harness, a hut, moulds, and making-table, with a few barrows and hand-tools; everything in the list being of the most primitive construction possible, the clay in some cases being kneaded by the treading of cattle instead of pugging. And yet from some of these old-fashioned brick-yards the very best quality of bricks is produced. Where roof and drain-tiles are manufactured, a tile machine and drying-sheds have to be added to the inventory; and when the bricks and tiles are delivered by the manufacturer, horses and carts are also necessary.

The fact that such simple machinery continues to be used so largely, and even preferred by many intelligent manufacturers, who have the command of ample means to get more complicated articles, is highly instructive in more respects than one. In the first place, for example, it leads the inquiring mind backwards retrospectively to the practices of the ancient Romans, Greeks, Hebrews, Egyptians, Sidonians, Babylonians, and Assyrians of oriental times, and the best quality of burned or baked bricks, which they made with machinery of a still more primitive character than that in question. In the second place, the attention is directed to the investigation of the principles upon which such simple machinery, ancient and modern, is constructed, in contrast with the more complicated and expensive machinery now being brought into the brick-field. In the third place, the question naturally arises as to whether in prosecuting the mechanical question we have not hitherto been losing sight of the chemical one. And lastly, ought not the mechanical question to be made more subservient to the chemical question during the future than has hitherto been done during the past?

The second and last of these questions are those which chiefly belong to our present paper; and, besides, they are the more interesting of the four, for other reasons. Sound principles are always cardinal questions in the construction and use of machinery; and when the intrinsic and practical value of that machinery is dependent not upon one, but upon a series of chemical demands being faithfully complied with, the ultimatum need not be told; for the fulfilment of the latter—the chemical conditions—embodies, as it were, the former—the principles in question. Hence the practical conclusion,

The modern machines, that stand in contrast with the ancient, whose principles of mechanism we have to examine, are pug mills, washing mills, grinding mills, moulding mills alias brick-and-tile machines, and compressing machines. Frequently the first and third are combined together, so as to form one machine, and with these two the fourth and fifth are also sometimes connected, so that the grinding, pugging, moulding, and compressing of the clay are performed at one and the same operation and time. In other cases the bricks are not compressed in the process of moulding, but separately, in a different machine.

In Oriental times the grinding, washing, and pugging were performed, for the most part, by the feet of slaves, captives, and cattle; and as the practice of treading the clay has come down to our own times, the contrast is simple, and the conclusion is easily drawn, for the best quality of the bricks in both cases decides the matter, and in very many cases, if not the majority, the decision is in favour of the old practice. Again, in hand-moulding, the moulder always, less or more, compresses the tempered clay into the mould, so that the practical question naturally arises for solution, Did the Chaldean and Egyptian "task-masters," in the brick-fields of Assyria, Babylonia, and Egypt, pay more attention to this peculiar manipulation of the art, than our moulders do in modern times? And the closeness of the grain and toughness or cohesion of the bricks in both cases evidently points to an affirmative answer in favour of Oriental art in this division of the work also, as in the previous one—the preparation of the clay for moulding.

Of course, the questions being practical ones, both the above conclusions must be received with a considerable degree of qualification. In the latter division of the work, for example, the ancient brick-makers may have paid more attention to the selection of a finer quality of clay, and to other chemical considerations involved in the mixing and seasoning or tempering of that clay, and in the burning or baking of the bricks, that are sufficient to account for the difference in the closeness of the grain and strength of the bricks being in their favour; and these again must furnish a similar key to the practical solution of the first division of the work, viz., the preparation of the clay for moulding.

It must be admitted, however, that our modern methods of pugging, grinding, washing, and machine-moulding are defective in many respects. In other words, our pugging, grinding, washing, and moulding mills are not constructed on sound mechanical principles, inasmuch as those principles do not harmonise with or respond to the peculiar demands of the chemistry of brick manufacture. A passable exterior at little money out of the readiest materials at command appears to be the watchword of the modern practice, rather than a fine grained, strong, durable brick; whereas the reverse of this maxim was evidently the oriental rule, in the case of the best quality of baked bricks. No doubt the ancients had inferior bricks also, viz., sun-dried bricks, which have long ago crumbled into dust, the best quality only having stood the test of time. This must be granted, but the set-off does not elucidate the object of the contrast under investigation, which is simply the points of superiority of the ancient practice, and the experimental lesson which those points teach for the information and improvement of the modern artist. True enough, we want a cheap brick; but inferior quality is invariably dear at any price; it follows, therefore, that quality must never be sacrificed to little money, or cheapness in the ordinary sense of the word: and this sacrifice is, we are apprehensive, being too often made, both as to the quality of the brick and the construction of machinery for its manufacture.

Confining our observations to the mechanical question, it will be necessary to go somewhat more closely into the details of mechanism both of the machinery and of the articles they produce, in order to show the soundness of the above conclusion relative to the sacrifices at issue.

The first inquiry which we shall enter upon has for its object the improvement of our pug-mills and washing-mills, by

showing wherein their details of mechanism are defective in principle. Thus the action of the arms of pug-mills and washing-mills, owing to their radiating from a revolving shaft, is greater towards their extremities than near the shaft or axle upon which they are fixed; consequently the clay is not uniformly acted upon and worked throughout. True, the arms of the former (the pugmill) may radiate tangentially, and be otherwise curved, so as to turn over and throw the clay from the centre towards the circumference of the barrel in which they work. But is not this sacrificing a second principle of mechanism, in order to atone for the first departure from sound principle?—a deceiving of ourselves, as it were, by having recourse to a system of special pleading to serve the commercial purpose of the moment in place of a better? For if the eye of the observer could only see what was going on within, the probability is that the old horse would have to turn tail and move in the opposite direction, owing to the greater velocity of the outer portion of the arms and the reaction of the clay upon the inner surface of the barrel. No doubt the proposition of turning the clay inwards towards the axle is nearly as objectionable as that of turning it outwards; but this is only a very good reason why both should be more closely examined from a practical point of view, and if need be, supplanted by less objectionable processes—processes embracing uniform velocity and action through the materials acted upon.

Again, with regard to washing and grinding mills actuated on the rotary principle, similar objections may be raised against them, owing to the cycloidal and central action of the working parts, and the unequal results which must consequently be produced upon the clay. And besides the mechanical objections of this kind, we shall also find that chemical objections may also be raised to both processes, washing and grinding, as now commonly performed.

In the ancient and still-common practice, the action of the implements and feet of men and cattle in working the clay was and is performed on the reciprocating rectilinear principle, and not on the rotary principle. The contrast, therefore, between the two is very remarkable, the economy and uniformity of motive power and effect produced being evidently in favour of the former, the old "to-and-fro"-working machines of the ancient brickmakers, who were well versed in mechanical science as applied to architecture. And the peculiarity in favour of the old-fashioned machines is, that the force applied is on the principle of percussion, the stroke in the case of the trampling of the feet of men and cattle, and the working of the "mortar bar" (a long, bent lever, or bar of iron) by hand, being downwards, while that of the "mortar drag;" or rake, was to and fro horizontally, the effect produced in both cases being far greater than the rotary stirring process, where the action of every point in the arms of the pug-mill is uniform, although the actions of the different points are different from each other, the velocity and force of the stroke being directly as the distance from the axle or shaft upon which the arms are fixed.

Of these two different principles, the latter (percussive force), and the effect produced by it in the working of the clay, is perhaps the more important and deserving of attention by those of our readers interested in the improvement of pug-mills and moulding mills, as it is a well-established and familiar fact that no amount of slow, uniform stirring of clay or like material, or pressure, will compensate for a sharp stroke of the "mortar bar," back of the labourer's spade, or bricklayer's trowel. Even in the process of hand-moulding the clay, there is a certain amount of percussive action in the filling of the mould that is essentially necessary to good workmanship. In all these operations the temper or worker of the clay, the brick-moulder, bricklayers' labourer, and bricklayer are familiar with the peculiar percussive stroke of their respective manipulations, and how much their success depends upon its proper performance. But we have not yet begun to teach our pug-mills and moulding mills how best to imitate this peculiar percussive action; the contrary—how best *not* to do it—being rather the general rule!

Again, the common method of removing stones, flints, and shells by grating and the like is objectionable, and obviously a departure from sound principles. The grinding of such substances into sand, so as to mix and be incorporated with the clay, is often as far from what the chemical requirements of good brick imperatively demand, the quality of such ground substances being in some cases objectionable, in others the

quantity being in excess, the chemical rule in both cases being their removal.

A few remarks on the mechanical properties of a brick will conclude our present paper. Under this head, bricks, both ancient and modern, may be divided into three qualities, apart from the ordinary division of English bricks into *place bricks*, *stocks*, *facing* and *cutting bricks*, &c.—*i. e.*, each kind may be further subdivided into three qualities of good, medium, and inferior. And this division also applies to machine-compressed bricks, to perforated bricks, machine-moulded bricks, and hand-moulded bricks. In short, it has reference to the fineness of the grain, and uniform solidity and moistness of the brick, including its cohesive and friable properties. The reader will thus perceive that, instead of a concluding paragraph, it would require a long article to do justice to this division of our subject. All, therefore, that we shall attempt at present is, merely to take a passing glance at its several heads.

Not the least important of these is a proper degree of uniform moistness; for unless this is attained, the brick will change its form in the drying and burning. And we may further observe, the question is of more importance than is generally imagined. The next thing is uniformity of grain. The grain may not be very fine; but if uniform, the brick may prove strong and durable. On the other hand, small stones or grit of any kind, lamina of sand, vegetable mould, or other improper substances will turn out an inferior article. Then we have uniform density—a quality difficult to be obtained in machine moulding, and even in hand moulding; and, lastly, perforated bricks and compressed bricks—the last the best, the clay being right in other respects.

ON AGRICULTURAL FIRES AND INSURANCE.

The following rules and precautions may be useful to some of our readers:—

1. Have your stack-yard situated near a pond, or as good a supply of water as possible.
2. Place your stacks as much as possible in *single line*, and as far from each other as you conveniently can.
3. Put a hay-riek now and then between the corn-rieks. These will keep in *check* any fire if properly attended to.
4. When you use the steam thrashing-machine have your stack-yard well cleaned up by removing all loose straw and litter. Have the machine placed on the *leeward* side of the stack-yard, so that the wind may blow the sparks *away* from it. Let the engine be as distant from the machine as the strap will allow. Have three or four buckets of water handy, and keep the pan of the engine constantly filled with water. Have the straw rapidly removed from the neighbourhood of the engine.
5. Forbid your men, upon pain of instant dismissal, to use lucifer matches or to smoke in or near the stack-yard. Keep all lucifer matches out of the reach of children: this is a frequent cause of accident.
6. If a fire has broken out, having despatched a trusty man to bring the nearest engines, depend upon the exertions of yourself and men. Do not allow the stack to be disturbed—let it burn itself out; but let every exertion be made to *press it together*, and as far as practicable to prevent any lighted particles flying about. If water be at hand, use it of course freely. Protect the adjoining stacks with soaked sacks, rick cloths, tarpaulins, &c. When the engines arrive, let them see after the coverings of the other stacks in the first instance rather than the stack on fire. If the stacks are separated from each other as before recommended, and there exists no danger to the other stacks, of course it becomes desirable to save as much of the one on fire as possible. This is best done by pressing and keeping the stack together rather than by opening it.
- 7, and last, but not the least precaution—INSURE YOUR AGRICULTURAL PROPERTY. The farmer who leaves the contents of his stack-yard to chance now, when the torch of the incendiary is so fearfully destructive, should be written down as either a fool or a madman.

ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The monthly meeting of the council of the above society was held on Thursday, Oct. 5, in 42, Upper Sackville-street, Dublin, Sir George Hodson, Bart., in the chair.

THE CLONMEL SHOW.

Captain THORNHILL, Secretary, stated that there was an objection lodged to the prize awarded at the Clonmel show to Mr. Furlong for flax, on the ground that it had not been grown last year. He had received the following letter, enclosing a declaration, from Mr. Furlong:—

“Fermoy Mills, Fermoy, Sept. 23, 1865.

“SIR,—I beg to enclose the required declaration, that the flax I exhibited at the Clonmel Show was grown in the year 1864.

“Was from home when your first letter arrived, or should have done so long before now.

“I am, Sir, obediently yours,

“C. J. FURLONG.

“To J. Badham Thornhill, Esq., Dublin.”

Mr. Owen—That is quite enough.

ALLEGED CLIPPING OF SHEEP.

The SECRETARY read the accompanying letter from Major Chichester:—

“Runnamoat, County Roscommon,
“September 19, 1865.

“DEAR SIR,—Press of business has prevented my acknowledging earlier the receipt of your favour of 7th instant. I assume that your letter was written under instructions of the council, and I have to request you to be good enough to bring to the notice of that body that in my humble opinion the letter in question does not in any way meet my objection.

“I may remind you that when asked what evidence I had that the sheep objected to had been clipped in a way forbidden by rule 35, I referred you to the sheep themselves.

“My herd might or might not be able to give evidence as to their being clipped on a certain day. In the presence of the sheep themselves his evidence could not have been very material: their testimony was enough.

“Again, I may observe that the answer of the judges, on being applied to, does not materially affect the question either. Their reply ‘that none of the sheep exhibited were so clipped as in any way to mislead or interfere with them in their adjudication,’ does not affect the point I raise.

“The society makes the rules, not the judges. Those laws, when made, are to be interpreted; certainly not by the judges. It must be the duty of the council to see that the rules of the society are observed, and not the duty of the judges.

“The society declares in rule 35 that when anything has been done that alters the natural appearance of the animals shown, such animals are to be disqualified.

“I called, and do call, the attention of the council to the fact, as I assert the natural appearance of certain sheep shown at Clonmel had been altered, and I call upon the council to enforce the penalty.

“I submit that the council are not in a position to throw any part of the onus of decision on the judges. I state a certain fact, namely, that the sheep objected to at Clonmel, when they were shown in August, had been gone over with the shears since they were shorn in the spring. I state further, as a fact, that such use of the shears does alter the natural appearance of the animal, and I conclude by interpreting rule 35 as being levelled against that and other practices, the necessary result of which is disqualification, none of which practices need necessarily mislead judges or interfere with their adjudication, though it undoubtedly does hoodwink the purchasing public.

“Speaking in all respect, I submit that the council must decide either—

“1st. That the sheep objected to, as stated, were not touched

by the shears since the spring shearing, so far as they can determine; or

“2nd. That being so touched with the shears does not alter the natural appearance of the animal; or

“3rd. That such alteration is not within the scope and meaning of rule 35; or my objection must be acknowledged sound, and must be sustained.

“That wool, if left to itself, will point as it grows, is a simple fact in natural history. That the wool of the sheep objected to at Clonmel did not point is another fact equally certain; therefore, I don't think the council can decide against me on either 1st or 2nd.

“If No. 3 is decided against me, the council must declare that rule 35 does not mean what it says.

“Requesting you to be good enough to lay this letter before the council,
I am, dear sir, yours truly,

“C. RALEIGH CHICHESTER.”

Lord JAMES BUTLER said he thought, as far as he could gather from the judges of sheep, they did not think they had been gone over after shearing. Mr. Thurnell's impression was that when the sheep were shorn the weak parts were left longer, to enable them to fill up, but no one said they were subsequently trimmed.

Captain THORNHILL remarked that all they said was that they might have been pointed with the shears.

Lord JAMES BUTLER said the objection was not against that, but against the sheep being manufactured into shape. He gathered from the judges that there had been no clipping, as they were all up to that.

Mr. McEVOY GARTEAN stated that a slight clipping would not be an infringement of the rule. The judges had already decided that they did not think there was any change in the natural appearance of the animals. If that were so, they could not now go into the matter.

Mr. FOWLER suggested that copies of the letters of the judges should be sent to Major Chichester.

The CHAIRMAN said the gentleman rather disclaimed the authority of the judges. If the rule was clearly interpreted there was nothing done to those animals in a way to alter their natural appearance.

The Secretary was directed to inform Major Chichester that it did not appear to the council that the animals in question were mutilated or tampered with in any way so as to alter their natural appearance.

THE REARING OF PIGS.

The following letter was received from Mr. Warburton in reference to the rearing of pigs:—

“Kill, Naas, Sept. 2nd, 1865.

“DEAR SIR,—The enclosed letter I cut out of the *Farmers' Gazette* of Saturday last, August 20th, and will feel obliged if you will lay it before the council of the Royal Agricultural Society at their next meeting, as a subject for their most earnest attention and consideration. I know not the writer, but to every word of that letter I subscribe.

“I have for years almost entirely given up exhibiting pigs at the shows of the Royal Dublin Society or the Royal Agricultural Society, because notwithstanding that I have had some of the best Berkshire pigs in the kingdom, and have done them ample justice, I found it impossible to bring them at a given age to the size which other breeders can.”

“If the abuse spoken of in the enclosed letter is not amended, the shows of both societies must continue to grow ‘smaller and more beautifully less’ each year. I trust the council will not consider this a matter for the judges, because judges have no right to doubt the statements of exhibitors.

Yours, faithfully,

“J. B. Thornhill, Esq.” “AUGUSTUS WARBURTON.

Lord JAMES BUTLER said the show of pigs at Clonmel was the best ever held under the society, and contained some of the most beautiful animals that he ever saw.

IMPROVEMENT OF PERMANENT PASTURE.

Some time since, at the meeting of the Croydon Farmers' Club,

Mr. E. STABLES (of Fickleshole) said: I have undertaken the task you have allotted me with some degree of diffidence and reluctance—not only because of a consciousness of my own inability to do justice to the subject, viz., "The Improvement of Permanent Pasture," but also because I am aware that the subject itself is not the most interesting or attractive to the majority of the members of this Club, and the more so as some remarks I may have to make will be by no means complimentary to many Surrey farmers; but I trust that the motives which actuate me may be appreciated (Hear, hear). I make no pretensions to a scientific knowledge or treatment of the subject; but I propose to make a few practical observations, with the view of provoking discussion, and of bringing out the importance of the subject. The extent of permanent pasture on the Surrey Hills being so very limited, in proportion to the arable land, it is too frequently treated with gross neglect, and not only so, with positive abuse. The plea seems to be that the one or two grass-fields are of so little consequence that they are not worth attention or cultivation, and hence they are simply a convenience to turn the cart-horses out at night, or to keep the milch cow, or for the working sheep to feed in a little during the day-time, when other food runs short, preparatory to being folded on the arable land at night; but the idea of returning any manure is regarded as ridiculous. When I first came into Surrey I was somewhat puzzled with the grass-land; as far as I could understand the general character of the soil, I thought it well adapted for grass, and yet the generality of the grass to be seen was very inferior. Of course I have met with many excellent exceptions to this, which are also very instructive. Having been brought up in a grazing district, and being accustomed to seeing the grass-land farmed, cultivated, and well manured, and profitable crops and nutritious grass grown, I was some time before I could realize the fact that the inferior grass to be seen in this neighbourhood was chiefly attributable to the suicidal manner in which it is treated. I have been so much interested in it that I have made it my business, whenever I have had an opportunity, to inquire, How is the grass-field treated? When was it sown? With what seed? How manured? How stocked, &c.? The more I inquired, the more I was convinced that much of the land on the Surrey Hills is especially adapted for grass; or with such treatment it could not have carried even a goose to the acre. I have every reason to believe that most of the land referred to was never sown down, but laid down as our forefathers a century ago used to do, *i. e.*, to plough and cross the land with cereals without manure, until it would grow no more, and then it was said to be tared, and must be laid down, and so it was left alone to grass itself with such seeds as mother nature might happen to have handy; and, as it is a law of nature that every place shall be occupied with a vegetation suited to it, consequently if there was any strength at all in the soil, there was sure to be a pasture of some kind; but, unfortunately, it was not customary to give any manure of any kind to pasture land, and, being so near London, and the price of hay tempting, the poor grass field—poor as it was—was mown year after year, until at last it grew so little that the mowers could not make a mow of it; so after that it was made a convenience on which to turn cart-horses or any other live stock. What could be expected from such treatment? What should you expect from arable land treated in that manner? And is it not as proper, and decidedly more profitable, to treat grass land as it is arable land, *liberally*? I think it is, for various reasons. The one great reason which is becoming more and more decided (and irresistible as an argument) every year, is the growing disparity existing between the price of live stock and corn; and, as far as we can understand the causes now in operation, we may expect it to continue and increase. What might have been the price of butchers' meat at the present time if our manufacturing districts had been in prosperity we can only conjecture; but we are quite sure it would have been considerably higher than

it is at present. Then as the extent of our grass land in this neighbourhood is so very limited, is not that an additional reason why it should be made the most of, and why we should cultivate it well, and make two blades grow where only one grew before? That our grass land is capable of great improvement there is no doubt. But as we claim to be professionals, our first duty is to ascertain the cause of the deficiency. Perhaps it is wet: if so, it must be drained, or all other expense will be comparatively wasted. Wonderful effects are produced by even draining wet grass lands. The coarse worthless herbage suited to wet land will disappear, as well as many noxious weeds, and speedily become replaced by herbage of a valuable nutritive kind. In some cases the land may have been sown with inferior kinds of grass, and would be much improved by the application of some good seed. If so, I would recommend the field to be liberally treated with manure, and mowing one year instead of pasturing, and not cut the grass too soon, but to allow it to get well ripe before being cut, by which means the roots of the old grass will be very much thinned, and room made for new seed, which, if previously harrowed, then sown, harrowed again with light harrows, and well rolled immediately the old crop is removed, would be likely materially to improve the character of the herbage. This is a most effectual mode of getting rid of thistles, hard-heads, &c. By one operation you will get rid of 95 per cent., and if you serve it the same the following year it will be a complete cure; but success in this instance depends much upon the previous liberal manuring. But the character of the herbage may be much modified and controlled by the judicious choice and application of artificial manures. If you wish to improve the quality apply a dressing of superphosphate or of Messrs. Hunt's pulverized bones, for several years consecutively, and if you give it a dressing of gypsum in the bargain so much the better; but if you wish for quantity irrespective of quality, I would recommend a mixture of soda and guano, or, as my practice has generally been, to apply a light dressing of superphosphate one year, guano next year, nitrate of soda another year, and so on. I have found this plan to answer very well, although it must be allowed that with the constant removal of stock from ordinary pasture land it must require a corresponding return in the shape of manure of some kind notwithstanding the droppings of the animals. They cannot manufacture all the land grows into manure; they must draw on the land for the manufacture of flesh and bones. Our object should be to return to the land in the shape of manure what we take from it in the crop, whether the crop be corn, beef, mutton, veal, or any other produce. But as pasture land has the benefit of cattle droppings it evidently does not require the extent of manure as meadow land where the entire crop is removed; yet we must allow that pasture land does require occasional manuring to preserve it in a state of efficiency. The character of the manure required will depend to some extent upon the kind of stock kept upon the land. If young growing cattle or milch cows have been grazed they will have extracted the phosphate contained in the soil. It is estimated that a milch cow carries off at the rate of 30lbs. of phosphate per annum; hence the propriety of applying bones in some shape or other. There is no doubt that fold-yard manure is the very best general manure; but unfortunately on most arable farms it is too scarce an article, and as our success in farming depends much upon the study and practice of economy, it appears more proper, as a general rule, to apply fold-yard manure where it can be ploughed in, although I do not think, as some people argue, that there is any great waste in the top-dressing with fold-yard manure. I think an occasional top-dressing with dung on meadow land, where the entire crop is mown and removed, may be allowed; but in the case of pasture land which gets the dung of the cattle pastured on it, and only requires a little more help, the propriety of using suitable artificial manures is evident. It is of importance that the droppings of the cattle should be frequently spread, and not allowed to remain just where they happen to fall. This is a very common neglect, by which much valuable manure is wasted or worse than wasted,

as an over-dose is positively injurious. Where horses are grazed it is frequently necessary to use a harrow or cart to remove the dung from one part of the field to another, and, even when this is done, it will sometimes happen that one part of a field will be over-manned, and the grass become coarse and refused by the cattle, in which case it is a good practice to mow that particular part, and remove the grass into the yards. On most of the Surrey hill farms chalk is easy of access, and a good dressing of chalk would in many cases be of great service in increasing and sweetening the herbage. Chalk is said to be a mother of grasses and clovers, and if you apply it freely, say 50 cart-loads to the acre, you may safely depend upon seeing your grass become full of white clover, &c., instead of the previous moss and rubbish. I would strongly recommend the use of the bush-harrow, and also of the heavy land-roller, about the month of April. In conclusion, I may be allowed to state that I am of opinion that most of the strong clay lands on the Surrey hills would be much better and more profitable as permanent pasture land. My own limited experience and observations teach me that the strong land to which I refer is especially adapted not only to grow grass, but to grow good grass on which beasts will thrive and do well, and, especially if you allow them a little oil cake, make themselves fit for the shambles. I admit that there is much very inferior grass to be seen; but why is it so? Is there not a cause? The question at issue between corn and grass is one of £ s. d. I would ask what sorts of crops of corn must be grown to be profitable, on land which requires not less than four, and sometimes six horses to plough it? I will venture to assert without fear of contradiction, that in average seasons, although you may be rent free, there is no profit, but generally a positive loss. In the cultivation of strong land, we are very dependent upon the season; in pasture land we have no anxiety either in seed time or harvest. I will again remind you that success in the growth of grass depends much upon doing it well. When you intend to lay a field down to grass, by all means have it in good heart, full of manure and thoroughly clean, and free from weeds; and sow good seed, not the sweepings of the hay-loft, which are frequently full of weeds. But as we are so liable to be imposed upon in the purchase of permanent grass seeds, I would strongly recommend you to apply to Messrs. Sutton and Co., or Lawson, or Gibbs, or some other respectable merchant or firm, whose commercial character would be a sufficient guarantee for a genuine unadulterated article, and also for a proper mixture of the different kinds of seeds suitable for the land; and do not pasture the young grass the first year, but mow, and mow early, not allowing the plants to run into seed, which will induce them to stock out and well occupy the ground. I feel much interested in this question; but being young and comparatively inexperienced in this part of the country, I hope to learn something from the practical observations which may fall from those around me, who have the advantage of me in age and also experience.

Mr. BROWN, of Coulsdon, said he agreed with Mr. Stables that grass-land was very profitable, but also very expensive, to lay down on a hill-farm. If the soil was not suitable for grass, it was of no use attempting to grow it. He had tried laying down land for pasture in one or two places, but it did not answer. Another time he had been more fortunate. He laid it down with red and white clover, cow-grass, trefoil, and two or three different sorts of ryegrass. He liked a mixture of seeds. He pastured the whole of the land so prepared: he did not at any time mow it. The soil was a stiff red clay, full of flints, and chalk subsoil. It was very hard work for horses to work on that land. One of his neighbours at Coulsdon laid down land of the same kind; and both were now as good meadows as could be found anywhere. The laying down of land would not do without dressings: upon that everything depended, and it must vary according to the quality of the soil.

Mr. HUNT complimented Mr. Stables upon the ability he had displayed in bringing this important subject before them, and said he had great pleasure in endorsing all that had fallen from that gentleman, agreeing as his (Mr. Stables') views did with those expressed by Mr. Hunt in the paper he had the honour of reading to the members two years ago on the same subject. Mr. Hunt impressed upon them the necessity of supplying a great defect in the manures of meadow-land, and urged the importance of using an abundance of phosphoric acid. Like Mr. Brown, he had found that the grass growing

by the road-side was stronger and more luxuriant than that grown on ordinary meadow-land, and that it also abounded in white clover. He had recently been reading a work by Mr. Cuthbert Johnson, who proved that white clover was indigenous to the soil of England, and that it was a mistaken notion with many farmers that the seed of this clover was in the bones employed as manure. He strongly advocated the laying down the sides of hills and other outlying soil into meadow-land, fully believing that, by proper attention to the manuring, &c., it would be found the most profitable.

Mr. WILSON remarked that a farmer who was a yearly tenant could not be expected to lay down land. He had tried it on one field, but it did not answer. He had pastured it; if he had mown it the first year it might have been different. He had now ploughed it up. One of the greatest difficulties in laying down lands upon the Surrey hills was the want of water. Instead of laying down for meadow land he preferred sainfoin, in which Mr. Brown agreed. His own experience of sainfoin leys differed from Mr. Brown's. He had ploughed up whole crops of it, and then had excellent crops of oats and barley. Where a farmer had meadow land he thought he should improve it by manuring. Last year he put on his meadow land London manure, which cost him £30, and whether he should get his money back again was a question he put to them. He was obliged to Mr. Hunt for the remarks he had made, for he thought they should be able to get some information from such; but he (Mr. Wilson) thought it would be more profitable to a yearly tenant to follow the four-course system and obtain his crop of hay by seeds.

Mr. CRESSINGHAM felt grateful, he said, to Mr. Stables for the paper he had read. He understood him to say that the first year he mowed his grass and then fed it. So did a friend of his; the latter laid down his ground flat, but he (Mr. Cressingham) should have preferred it in ridges.

Several members of the club assured Mr. Cressingham that the laying land down in ridges was quite obsolete.

Mr. CRESSINGHAM finished by saying that in converting arable into pasture land its adaptability for grass seeds should be first taken into consideration.

The VICE-CHAIRMAN said the subject was one well worthy attention; the paper was a most able one, and he (Mr. Humpidge) agreed with the observations made, *in toto*. He must, however, take one slight exception—where Mr. Stables said that if the pasture did not turn so well as expected mowing it late destroyed the thistles. Now he (Mr. Humpidge) never found anything would wholly exterminate them. If, however, mowing would, it was a fact worth knowing. The best time for manuring was after mowing, or, as some one had facetiously said, directly after they had got the hay off. Where land was so stiff and heavy as to require six horses to plough it, undoubtedly it had better be laid down for pasture. He thought, with Mr. Hunt, that the reason Mr. Brown did not succeed in the land he had first laid down was because he had mown it first instead of feeding it. He also thought it was very likely the right manures were not used. He thought it would have been better to have gone to some respectable firm, like that of their friend Mr. Hunt's, and have purchased those seeds best adapted for the soil. Sainfoin was a very good substitute where they could not get a permanent pasture. Sheep do better on short pasture than on long. A good deal of stock can be kept on pasture where it was a stiff land. A great deal of food was provided by tares, &c. He agreed with previous speakers, that where land was laid down a judicious mixture of seeds was very necessary. He also spoke of the disparity between the price of butchers' meat and corn, and showed that by laying down permanent pasture they would be taking a course which would prove highly remunerative.

The CHAIRMAN begged to add his testimony to that given by previous speakers as to the ability of the lecturer and the instruction conveyed in his practical remarks on the most important subject. The chairman expressed his concurrence on the general remarks of the introducer, and said that Mr. Streeter and some others of them had an opportunity last year of visiting Mr. Law's establishment, where they saw the effect produced by various experiments. By mowing the first year it allowed the grass to develop its roots and to fix itself firmly in the soil; the after-pasture was not fit till the end of autumn. Pasturing all the year after sheep was found practically to weaken the vitality of many of the grasses. In the second or

third year after sowing, the field certainly ought to have a good dressing of manure. Nitrate of soda had been found to destroy clover, either by the production of hostile neighbours or by operating immediately upon the plant. He recommended the use of phosphates in order to replace those elements abstracted by milch cows, sheep, and other animals. He agreed in the general tenor of the opinions expressed by Mr. Stables as to

the necessity of laying down meadow land, and he (Mr. Fuller) feeling the importance of this subject, promised on some future occasion to introduce for discussion the propriety of increasing the area of their grass lands.

Mr. STABLES having made a brief reply, a cordial vote of thanks was passed to that gentleman, and the proceedings were brought to a close.

THE GAME LAWS OF ENGLAND.

BY JUDGE FRENCH.

COMPARATIVE COST OF KEEPING RABBITS AND SHEEP—GAMEKEEPERS—MORAL EFFECTS OF GAME LAWS—FOUR TO FIVE THOUSAND PERSONS PUNISHED YEARLY FOR VIOLATION OF GAME LAWS.

A gentleman in England instituted in 1845 a series of experiments to ascertain the comparative food consumed by sheep, and by hares and rabbits. He shut up two Down sheep in one pen, and twelve tame rabbits, about equal in size and weight to hares, in another. He measured and weighed their food, which was of such kinds as hares and rabbits would live upon if at large, and fed them all, as much as they would consume, continuing the experiment six weeks. During this time, the twelve rabbits consumed of oats, cut sainfoin, bran, carrots, and swede turnips, 33 bushels 3 pecks 11 pints; the two sheep consumed but 25 bushels 3 pecks and 9 pints. From this experiment it appears that four and a half rabbits consumed in six weeks within a fraction of as much as one sheep!

When we add to this enormous consumption by hares and rabbits the amount which they destroy without eating it, we may form some idea of the scourge which game is to the farmer.

It seems difficult to define bounds to the evils of this system of game laws. The great loss of crops to the farmer and to the nation is but the beginning of the difficulty. In every conceivable way are its effects disastrous. The rent of estates subject to game is always lower on that account, and this loss falls upon the landlord. In speaking with farmers upon the subject, they endeavour to console themselves with this idea; but they feel that it is a poor satisfaction for the ruin of their beautiful harvests, the frustration of their plans for the season, and their disappointment of the promise that seed-time and harvest shall not fail them, to be told that their rent is lower, because of their waste and desolation.

Gamekeepers are employed by the landlords to constantly watch night and day over the game; and the sight of an idle vagabond, wandering constantly over the farm, spying out the actions of every labourer, and of the sons and servants, too, of the farmer, lest some rabbit or partridge should be destroyed, is enough to try the patience of any Englishman. The dogs and cats of the tenants are shot and trapped by these keepers, and bushes are stuck up all through his field of grain to prevent the use of nets by poachers, who catch the birds by sweeping over the wheat at night. Restrictions of various kinds are put upon cultivation, for the protection of game. One farmer is forbidden to mow his crops rather than reap them, because the stubble may be too short to shelter the game; another may not turn his stock into his stable till the 10th of October, lest the game should be disturbed. "I should have cleaned up that fence," remarked a farmer to us, by way of apology for a want of neatness in one field, "but we found the partridges had nests there, and were obliged to stop," and this was a farmer on his thousand acres, which his family had occupied for a generation. We looked up for a blush of shame at the servitude, or a look of indignation at the outrage, but custom had dulled the sense of wrong.

The preservation of game, again, has a tendency to prevent permanent leases. The landlord, valuing his amusements more than his money or his tenantry, will not limit his preserves; and the farmer, knowing that the game may be increased as rapidly as his crops, and may in two or three years overrun his farm, fears to confine himself for a long time to his position. All the evils of short and uncertain tenancies are thus in part attributable to the game laws.

But the evil effects of the game laws fall most heavily on the poor labourer. Whatever lessens productiveness, and renders the rewards of labour precarious, lowers the price of wages, and discourages the labourer. The prevalence of game

lessens manifestly the productive capacity of land; for even if hares were as profitable stock as sheep, they would ruin the farmer by their distinctiveness. Imagine a flock of 500 sheep running wild where they please through the crops, and we may form some idea of what their equivalent of about 2,250 hares might destroy. Farmers neglect permanent improvements from uncertainty of tenure, and so the demand for labour is lessened.

There is yet a darker shade than this to the picture, in the demoralization of the labourer. He cannot be made to believe that there is great moral wrong in supplying his starving family with the flesh of these little wild animals, which the farmer who employs him, and everybody else but the gamekeeper and the landlord, whom he sees once a year, denounces a curse to the soil, and which nobody values except as they afford a day's sport to a shooting party in autumn. Poaching therefore becomes common. Children are educated to violate the law, and a natural warfare arises between the rich and the poor. In spite of the severity of the penalties, from 4,000 to 5,000 persons have been annually convicted and fined or imprisoned for infractions of the game laws for several years past, and the public journals give frequent accounts of desperate encounters between gamekeepers and poachers. What can possibly ensue when the poor working man sees a fellow-labourer arrested and committed to prison, and there detained for an indefinite period for want of ability to give sureties for the future, or torn from his family and home, and transported beyond the sea, at the instance of some prowling gamekeeper, and all for taking a paltry hare or partridge, which consumed the very bread which his children were crying for? What can ensue from such scenes but a law-defying spirit on the part of the labourers, and hatred of the landlord and all who administer the laws? The rates are vastly increased in many parishes by the maintenance of the families of offenders, and the public peace is constantly disturbed by arrests and trials, and the suspicious and accusations, true and false, which are continually excited.

In 1848 an Act of Parliament was passed which allowed farmers to kill hares on their own holdings without a certificate; but no occupant can authorise more than one person to kill game at the same time, nor give authority except in writing and recorded. So far as the destruction of game is concerned, this Act has no effective operation. The farmers know well that they shall bring upon themselves the jealousy and ill will of the keepers and landlords if they attempt to exercise the right, and that their leases will be in danger. As an admission of the evil of preserving, and as a concession to the tenants of a point upon which landowners have been particularly sensitive, this Act is both important and significant.

The only defence of the game laws is that rural sports keep the landlords at home for their amusements instead of going abroad. No doubt a resident landlord is of far more advantage to his tenants and to his country than one who lives away from his estate; but a taste for agricultural pursuits, the desire for improvement, and the increase of his rents are motives fully as powerful as the poor sport of shooting these half-tame pheasants, actually hatched under hens and fed by the keepers, like chickens or hens, so unconscious of danger that you may kill them with a staff. A landlord who has no higher motive for living on his estate than the indulgence of this sort of half-civilized taste would not be likely much to damage his country by going away from it for a residence.—*Country Gentleman (American)*.

THE WATERING OF LANDS BY STEAM-POWER.

The present is not the first time we have discussed this topic in these columns. We return to it for the purpose of examining it from a somewhat different point of view than on either of the former occasions; and besides this, there are other and perhaps more practical reasons, for the subject is of such incalculable importance that it requires to be kept alive, as it were, in the columns of the agricultural press until it is universally reduced to practice, when it will speak for itself.

We never see a portable engine idle in the summer months about a farmer's homestead, when his pastures are burnt up, his fallows labouring under that horrible disease "*eremacosis*," alias *dry rot*, and his cattle suffering as to quantity and quality of food, both solid and liquid, than the conclusion forces itself upon the observation that "something is manifestly wrong that might easily be put right." Were there a clean crystal stream flowing in the ditch at the headlands, the cattle, from their locomotive functions, would go and help themselves, while practical men of a mechanical turn would direct the current here and there down the crown of the ridges, and thus convey the water to the parched spongesoles of the dying grasses. Now, although it may seem queer to some of our readers, it is nevertheless patent to us that the farmer's steam-engine is nothing less than a running stream in the ditch at the headlands of his parched fields, minus a few yards of piping and as many pounds of coal.

Water applied to pasture-lands when the grasses are growing should be pure, comparatively speaking—very free from saline and manurial matter, in the common acceptation of the phrase. Practically speaking, the more closely it resembles rain-water in purity, the fitter it is for being artificially applied to pastures upon which cattle are grazing; and the reason of this must appear obvious to all who have studied the physiology of growing crops at the bar of practice, for the leaves of plants have an alimentary and vital function to perform, as well as the roots; but the two functions are totally different the one from the other, in many respects; so that the agriculturist who applies liquid manure to the leaves of his grasses while growing subverts the course of nature, consequently both leaves and roots are poisoned for a time, the latter suffering from the downward poisoned current of abnormal sap. The practice may do more harm than good, as we have often experienced when applying liquid manure from the straw-yard tank at the homestead to grass-lands in the summer-time, the unmanured ridges yielding a fuller bite of sweeter grasses than the manured, until the leaves of the grasses have received a thorough wash from a heavy shower of rain, and fresh young herbage has begun to rise, possessing a healthy vitality capable of elaborating the sap, as fast as it rises from the rootlets, into an abundance of food for cattle. When a heavy crop of grass has been mown, and the swathe removed immediately, the vitality of the grass above-ground, or hay stubble, is arrested, as it were, for a short time; and during this short time a heavy dose of liquid manure of a proper kind may be applied, more especially if washed into the ground either by being in a highly-diluted state, or by a liberal supply of pure water after the manure, so as to wash, as it were, and clean the stubble, out of which the fresh herbage springs. Pastures that have been eaten very close down by sheep or neat cattle may be treated in a similar manner, the stock being removed for a time to another field yielding a full bite. We need not enter upon the philosophical *rationale* of all this, as the practical details themselves must be familiar to the generality of our readers.

The practical *rationale* of the benefits arising from the application of pure water to the burnt-up pastures is a very simple and self-evident one. The heat of the sun, for example, has removed from the land in question pure water by evaporation—such is the natural cause of the malady experienced; and the obvious remedy for such a malady is the restoration to the land of an equal quantity of pure water by artificial means, in the absence of the natural supply, viz., a sufficiency of rain-water.

Such is briefly the practice and science of watering grass

lands in the summer time. At the commencement of the season the land should be in a sufficiently fertile state to produce the grazing crop of grass intended to be grown during the summer months, and this fertile state includes a sufficiency of water in the soil. But as the season advances there is a two-fold drain upon the water in the soil, there being on the one hand a continuous evaporation going on from the surface, and, on the other hand, an equally constant removal of water by the crop grown and consumed by the grazing stock. If the dews are abundant overnight, and if the clouds occasionally "drop fatness" during the day, vegetation may go on luxuriantly, cattle thrive amazingly, and graziers prosper a main, reaping the just reward of their skill and labours; while at the end of the season their pastures may to outward appearance be nearly as rich and fertile as at the commencement. But in our fickle climate such a favourable season is the exception, periods of drought, with their long train of trying consequences, being the rule. Hence the requirements both of the soil and of the grasses with which it is stocked.

Long periods of continuous rain are as objectionable to pasture grasses as similar periods of drought, more especially in examples of tenacious clay soils. The harm done under such conditions are manifold; for heat is carried off by the great evaporation that is always experienced during the summer-time, the free circulation of the atmosphere in the soil is excluded, the finer grasses become sickly from the abnormal position in which they are placed, and the imperfectly elaborated juices of which they are formed; the coarser grasses fill up the ground, the land itself becomes impoverished owing to the absence of heat and air, together with those fertilizing processes to which they give rise when present in normal supply. Copious showers now and then are what the land requires, to keep up the fertilizing processes, and the physiological requirements of the grasses are similar.

The continuous application of water by artificial means to land is equally objectionable, if not more so, than the natural supply in excess. No doubt certain grasses will prosper in running water, as may readily be seen along the edge of rivers, or where water is allowed to flow slowly over a meadow. The irrigated meadows of the olden time are familiar examples to the point; but neither the practical nor the scientific *data* involved in this kind of irrigation apply to the case in question. The science and practice, on the contrary, is that of genial showers of rain; so that the closer Art imitates Nature in this respect the more successful will be the result.

Water may often be artificially applied to fallow lands and fallow crops with the highest degree of success; and what may appear perhaps exceptional at first sight is the fact that wet sour clayey lands, when burnt up in the summer-time, as they are very liable to be in dry seasons, would gain the greatest benefit from an artificial supply. It is no doubt difficult to apply water to turnips in the early stages of their growth without doing harm, or to fallow crops of any kind, by means of the hose and jet. After the plants begin nearly to cover the ridges, the ground may then get a good soaking without crusting or doing harm, and the watering may be kept up if necessary until the crops fairly cover the ground in such a manner, or so closely, as to prevent undue evaporation, and thus prevent further harm from continuous drought. But the hose and jet, although adapted for grass lands and naked fallows, are open to vast improvement as regards fallow crops, and even arable husbandry generally; so that the practical question arises—To what extent can improvements be profitably carried in the artificial application of pure water to land, and at what outlay of capital?

Farmers who have had an extensive experience in watering newly-planted crops of cabbages to start the young plants, of the water-drill in the growth of turnips, and those who have the farther experience of applying the liquid manure to their crops in general, will be able to form an approximate opinion as to the practicability of the project both from a physical and pecuniary point of view. They will readily perceive that profit to landowner and tenant, or interest on their respective

capitals invested, will greatly depend upon their natural supply of pure water, and the facility that exists for its general distribution and application. So far as grass lands extend, the general application may be considered a determined question, even with the improvements already in operation, in a few exceptional examples, improvements universally at the command of all. In hilly districts, water, if pure and judiciously collected, may in many cases be applied by gravitation without the expense of steam power. But into mechanical details of this kind we do not intend to go, the general scope of our present paper being rather of a chemical than mechanical character. Water forms, for example, a much larger per-centage of growing crops than any other elementary substance present, and therefore it follows that when it is deficient in dry seasons its artificial supply becomes one of those tangible affairs about which a question of profit can hardly be raised, even by sceptical minds of the more scrupulous and doubting character, for it virtually amounts to the difference between good and bad seasons as to the produce of harvest, a difference which would do more than pay redeeming interest on capital twice told, provided always the natural supply of pure water is sufficiently abundant. The presence of a suitable supply of water and atmospheric air is also essentially necessary to the decomposition and incorporation of animal, vegetable, and mineral substances in the soil, so as to place it and keep it in a profitably crop-bearing state. Thus farmers from time immemorial have been familiar with the beneficial effects of a thunder-shower upon naked fallows, when the staple gets literally burnt into bricks, and the subsoil fissured to such a degree as to render it dangerous to cattle, the openings being sufficiently wide to let down the feet of sheep and neat cattle, and even to make horses stumble, trip, and fall. So great are the fertilizing effects produced, that in all ages chemists and agriculturists have been prone to analyze the contents of clouds, as containing something more substantial than pure water, and consequently to put a lower estimate upon the actual effects produced directly and indirectly by water than is legitimately due to its action and presence as a fertilizer. This is no less unscientific than short-sighted, and therefore it is high time to toss to the winds at least the big half if not the whole of the nitrogenous and other utopian fertilizing theories of the day, and to lay hold on Nature by the ears, simply and practically as we find her, for the age of mystification has long since gone to the dogs with that of impossibility in the chemical laboratory of the universe over which she presides. When a practical farmer both hears and sees the big clouds beneath his feet hissing, cracking, and splitting up into minute fragments like lime shells when water is poured upon them, what is the use of going up and bringing down from the clouds either nitric acid or ammonia to fertilize his land, however stubborn and untractable it may be in dry weather? The practical conclusion is too manifest to require a formal deduction from such premises.

But this is not all, nor even the most unfavourable state of fallow lands, in scorching, dry weather, whether naked or under crop; for the moment they are deprived of the necessary degree of moisture to promote decomposition and fertility, the opposite abnormal process of "dry rot," or crenicacis, begins, the elements of fertility being thus either removed from the land, or else changed into obnoxious substances injurious to the health of cultivated crops.

Our great fen districts claim a special notice, as they suffer severely from drought, whether under corn, grass, or fallow crops. Hence the practice of letting in a bottom-supply of water. But this practice is only, at the best, "the least of two evils;" for, although stagnant bottom-water may be infinitely better than no water at all, or even than pure water improperly applied by artificial means, it must nevertheless be confessed that it is injurious both to the land and to the crops it grows, for it keeps down the fertility and productiveness of the staple to a degree far below what it would otherwise attain, under a proper supply of water and atmospheric air from above, and drainage of superfluous water from below. Under this head we need not go further into detail to show the practical reader that between these two extremes there lies, in the profitable farming of fen-land, a wide field for improvement; for in most of our fen districts there is a plentiful supply of pure water at the command of the landowner: and, therefore, why should it not be brought within the reach of the tenant, for application, practically speaking?

Of the most profitable plan of applying water to fen-land under white crops, grass, or fallow, it would be out of place almost to say a word, in a concluding paragraph. The Arabs, who now farm the cradle of our race, raise the water from the Tigris and Euphrates and their tributaries in skins, and allow it to flow amongst the newly-ploughed furrows, thereby supplying air and water to vegetation; and Herodotus informs his readers that in his time the fertility of Assyria, by such means, was incredible. It is, therefore, just possible that the practice which has thus come down from the patriarchal times of Noah, Shem, Ham, and Japheth to our own day, may illustrate those principles that require to be reduced to practice in the artificial watering of our fen districts, due attention being paid to bottom-drainage and aeration, so that, along with wholesome water, the land may at the same time receive a suitable supply of atmospheric air for the requirements of the crops grown. With a plentiful supply of water-pipes and hydrants, the expense of giving grass-lands, spring and summer fallows, and stubbles after harvest, to soften them for autumn fallowing, a proper watering, would cost very little; and were an underground system of irrigation pipes laid, on the "herring-bone principle," as has often been proposed for general sewerage practice, and in several individual examples carried out on a small scale, there would be no difficulty in giving arable lands under crop one "bellyful" after another, should they require it, in dry seasons. ENGINEER.

WEEDS AND THEIR ERADICATION.

Weeds are a terrible pest, and an unceasing warfare must be made upon them, or they get the ascendancy, and will then have their own way. Many farmers go through grain crops pulling out the weeds, and thus prevent the seeds ripening and spreading upon the land. Oat fields may now be attended to, and the weeds taken out without injury to the growing grain. Weedy meadows should be cut first, especially those overrun with white daisy. This is a very troublesome weed, and when it once gets possession of the soil is hard to eradicate. In passing through the country we see many fields completely covered with this bad weed, and often where there is evidently no pains taken to keep it in check. Lands overrun with daisy do not yield half a crop of grass, and are worth but half so much as adjoining fields of the same quality of soil that are free from weeds. If farmers would join together in neighbourhoods and make war in earnest upon the daisy, it could soon be forced from the soil. Where there are but few stalks these should be pulled up by hand; but where the number is very considerable they may be kept in check by early mowings, and then by heavy manuring and the use of plaster and other fertilizers may be completely subdued and exterminated.

We have tried this plan with success. The daisy does not make its inroads upon farms in extensive patches at one time. It creeps in slowly and stealthily here and there, hoping to get a permanent foothold before the farmer is aware of its bad character. It is thus early that the weed is easily overcome; but no half-way work will accomplish the business. Our plan is to sow clover, manure heavily with barnyard manure, and then plaster. By this course we get a large growth of grass, and "choke the critter off."

One of the worst pests in cultivated grounds on the black slate lands of Herkimer is quitch or couch grass. It soon gets possession of the soil, and grows with remarkable vigour. When it fairly gets into the land, the labour of getting it out by cultivating and hoeing is of no ordinary character—at least we never enjoyed the sport of hoeing it to death.

A few years ago it got possession of one of our fields, and we battled with it after the following manner: We commenced ploughing and harrowing early in June, and continued the work every eight or ten days, until in July, when the piece was rather heavily sown with buckwheat. The hot sun came down and roasted the roots, hauled out upon the surface with

the harrow; they gave up the ghost, and what remained the buckwheat smothered to death. A nice large yield of buckwheat was the result of that year's cultivation, and the next season we had a clean mellow piece of ground, with not a vestige of quitch in any of its parts. Doubtless in damp wet seasons this could not be so thoroughly effected, since many of the roots on the surface would catch and grow, instead of being roasted out.

The hot dry weather of July and August is a good time to destroy many kinds of weeds, and advantage should be taken of this time to destroy as many as possible. It is true one requires a large share of courage to make the attack on a large and weedy farm, and men often do not get credit for their efforts in this direction. We have seen one man fighting weeds with all his might, while his neighbour seemed to take pleasure in growing them, for the winds to scatter myriads of seed back again over the farm. We suppose there is no law to reach these cases, and yet there ought to be, for the shiftless neighbour is morally guilty of a species of robbery which should be recognized in our statute books.

Some western people are wiser than we of the east on this weed question. In Wisconsin they have a law making it finable for any man suffering certain kinds of weeds to go to seed on his premises, and any one has a right to complain and bring the offender to justice.

Perhaps the day may come when we of the east will become far enough advanced in weed-civilization to have such a law in force. Indeed there is reason to hope so, since we have made one progressive step recently in getting the cattle out of the highway, although many think this a sad infliction.

The New York Cheese Manufacturers Association, at their

late annual meeting in this city, passed a vote of thanks to those Legislators who were instrumental in getting a milk law. This is all right. Good acts should be recognized and services rendered appreciated; and it would not have been out of place if agricultural societies had made some recognition of the services of those who gave us the blessing of having cattle excluded from the highways.

This weed question is also an important one, since neglect and carelessness on the part of many are entailing immense waste and injury to some of our best lands. It is true the destruction and extermination of weeds is an expensive work; but then it is not money entirely thrown away, since the land is generous and willing to pay back something in increased crops. But one, after a while, gets tired of fighting weeds when farmers about him sow by the help of the winds a little faster year after year than he can destroy. We recently looked over a nice farm, where the large meadows were white with daisies, and the proprietor remarked that he had fought the weeds for years, keeping his meadows clean, but that his neighbours sowed faster than he could destroy, and so he gave up in despair and let the weeds have their way. This is only one instance out of many, and we begin to hear it asserted that daisy fodder is not so bad after all, for the herds will eat it and thrive. Of course they will eat it when nothing better is presented; but then admitting the point, see the largely-increased quantity of land required to winter a cow. These daisy lands are the ones that yield one-half, three-fourths, or a ton to the acre, while it takes the clean meadows of timothy or clover to turn out crops of two, three, and four tons. This point, at least, should not be lost sight of.—*Utica Weekly Herald.*

CHESHIRE AGRICULTURAL SOCIETY.

This society held its annual exhibition of stock at Congleton, on Thursday, Sept. 28. The showyard was well selected, and the weather was exceedingly fine. Between £500 and £600 were given in prizes by the society, in addition to which special awards were given by the Marquis of Cholmondeley, J. Tolle-mache, Esq., M.P., Earl Grosvenor, M.P., the Rev. J. Thornycroft, R. Barbour, Esq., Bolesworth Castle, and W. Atkinson, Esq., of Ashton Hayes. The judges had no difficulty in awarding the first prize for the best bull above two years old to M. J. B. Glegg, of Withington; and if a second prize had been at their disposal it would have been awarded to Mr. Thomas Forrest, of Spurstow Hall, whose bull was highly commended. Mr. Forrest in other classes was decidedly the most successful exhibitor, carrying off the second best premium for a bull calf, the first premium for a pair of dairy cows, the first premium for the best dairy cow, and for the best pair of heifers. The entries for horses were larger than at the previous show, and included several very useful animals. The judges were unanimous in their commendation of the horses for agricultural purposes, and awarded the first prize for the best pair to Mr. Charles Beresford, of Elton, and the second to the Stonetrough Colliery Company, Ramsdell Hall. This company also received Lord Grosvenor's prize for the best brood mare for breeding hunters. The number of sheep entered was much fewer than last year. The judges were—For cattle: Mr. W. Fair, Aston, near Budworth; Mr. Hornby, Aston Park; and Mr. Robinson, Doddington. Horses: Mr. Davies, Eardswick Hall; Mr. Taplin, Newton-le-Willows; and Mr. Barker, of Brereton. Sheep and pigs: Mr. Hassall, Bunbury, near Whitechurch; Mr. Hopkins, Marbury, near Whitechurch.

LIST OF PRIZES.

Champion Prize, for the best dairy of cheese, Thomas Willis, Tarvin.

STOCK.

Best bull above two years old, £15, J. B. Glegg, Withington.
Best bull above two years, with a view to the dairy, £10, John Vernon, Willingtons; second best, £6, Geo. Willis, Ridley Hall.
Best bull calf, £3, Thomas Forrest, Spurstow Hall.

Best pair of dairy cows, £8; best dairy cow, either in calf or milk, £5; best pair of heifers, £5; and best pair of stirks, £4; second best, £3—T. Forrest, Spurstow Hall.

Tenant farmer's best yearling bull, £8, Thomas Finchett, Rushton; second best, £5, Jabez Hart, Duckley.

Tenant farmer's best bull calf, £3, John Vernon, Willingtons; second best, £2, Joseph Woolf, Haslington Hall.

Tenant farmer's best pair of dairy cows, £8, George Willis, Ridley Hall; second best, £5, Thomas Lea, Brereton.

Tenant farmer's best dairy cow, either in calf or milk, £5, Joseph Vernon, Willingtons; second best, £3, Isaac Ford, Eaton.

Tenant farmer's best pair of stirks, £4, Charles T. Dean, Astbury; second best, £3, Peter Wright, Church Minshall.

Tenant farmer's best pair of heifer calves, £1 10s., Peter Wright, Church Minshall; second best, £1, Samuel Tellwright, Lawton.

Labourer's best stirk, £2, George Lockett, Haslington; second best, £1, William Kay, Haslington.

FATTED PIGS.

Agricultural labourer's best fattened pig, £2, and second best, £2, Ralph Threadgold, Haslington.

PIGS, LARGE BREED.

Best boar pig, of any age, £2, William Gaman, Thornton-le-Moors.

Best boar pig, under two years old, £2, Samuel Davies, Eardswick Hall.

Best breeding sow, of any age, £2, William Gaman, Thornton-le-Moors; second best, £1 10s., Samuel Davies, Eardswick Hall.

Best breeding sow, under two years old, £2, Samuel Davies, Eardswick Hall.

Best litter of pigs, not less than eight in number, £2, Peter Wright, Church Minshall.

Best pen of pigs, four in number, £2, Joseph Robinson, Lee Green Hall.

Best pair of gilts, £2, Samuel Davies, Eardswick Hall.

PIGS, SMALL BREED.

Best boar pig, of any age £2, and best boar pig under two years old £2, H. E. Evans, Stamford Heath.

Best breeding sow, under 2 years old, £2, William Gaman, Thornton-le-Moors; second best £1 10s., Sir Philip de M. Grey Egerton, Bart., M.P., Oulton Park.

Best litter of pigs, not less than eight in number, £2, Samuel Tellwright, Lawton.

Best litter of pigs, four in number, £2, William Gaman, Thornton-le-Moors.

HORSES.

Best pair of horses for agricultural purposes, £6, Charles Beresford, Elton; second best, £4, Stonetrough Colliery Company, Ramsdell-hall.

Best stallion for agricultural purposes, £10, Samuel Massey, Lawton; second best £5, William Horton, Haslington.

Best mare or gelding, as a roadster, £3, Thomas Poinons, Tilstone; second best £2, Thomas Balmer, Wharton.

Best brood mare, with the foal at her foot, for agricultural purposes, £5, Stonetrough Colliery Company, Ramsden Hall; second best, £3, Peter Wright, Church Minshall.

Best two-year-old gelding or filly for agricultural purposes, £3, Joseph Trickett, Sandiway; second best, £2, John Hornby, Minshall Vernon.

Best yearling gelding or filly for agricultural purposes, £2; Isaac Worthington, Davenham; second best, £2, John Rigby, Little Leigh.

PREMIUM GIVEN BY THE RIGHT HONOURABLE THE EARL GROSVEGOR, M.P.

Best brood mare for breeding hunters, £5, Stonetrough Colliery Company, Ramsdell Hall.

SHEEP.

Best long-woolled ram, £3, William Brown, Wirsall; second best, £2, Thomas Richardson, Elton.

Best shearling long-woolled ram, £2, Samuel Davies, Eardswicke Hall; second best, £1 10s., Thomas Richardson, Elton.

Best long-woolled tup lamb £1 10s., John Sheen, Tilstone Fearnall; second best £1, Thomas Richardson, Elton.

Best three long-woolled ewes, £3, William Brown, Wirsall; second best, £2, Thomas Richardson, Elton.

Best three long-woolled shearling ewes, £2, Samuel Davies, Eardswicke Hall; second best, £1 10s., T. Richardson, Elton.

Best three long-woolled ewe lambs, £2, Richard Richardson, Sandhaeh; second best, £1, Thomas Richardson, Elton.

Best short-woolled ram, £3, Sir Philip de M. Grey Egerton, Bart., M.P., Oulton Park.

Best short-woolled tup lamb, £1 10s., Thomas Rigby, Darnhall; second best, £1, Joseph Beckett, Peel Hall.

Best three short-woolled ewes, £3, Thomas Rigby, Darnhall; second best, £1, Sir Philip de M. Grey Egerton, Bart., M.P., Oulton Park.

Best three short-woolled shearling ewes, £2, Sir Philip de Grey, Egerton, Bart., M.P., Oulton Park.

Best three short-woolled ewe lambs, £2; second best, £1, Thomas Rigby, Daruhall.

NORTH WEST BUCKS AGRICULTURAL ASSOCIATION.

The annual show and meeting of this association was held Sept. 20. Owing to the prevalence of the cattle plague, the committee wisely considered it advisable not to hold the show of horned stock. The entries were in the horse classes, to make amends for the absence of horned cattle, more numerous than we have seen here on any previous occasion, and the animals themselves were for the most part of a very creditable character. The sheep entries were fully an average. In the ewe classes, besides the prizes, more than one commendation was given by the judges. The pigs were few.

The following are the awards in the different classes:

HORSES.

JUDGES.—Mr. J. M. K. Elliott, Heathcote, and Mr. Walter George, Gayton.

The best cart mare and foal.—Prize given by the Right Hon. Lord Southampton. £3, Mr. W. Hawkins, Bourton; £2, Mr. Jonas Paxton, Bicester.

The best cart filly, under three years old.—£2, Mr. E. H. Ridgway, Bourton; £1, Mr. James Bennett, Stowe Castle.

The best cart gelding, under three years old.—£2, Mr. Thomas Lines, Hillesden; £1, Mr. John Barge, Cowley Lodge.

The best yearling colt or filly, for agricultural purposes.—First prize given by G. Morrison, Esq. £3, Mr. R. Webb, Steeple Claydon; £2, Mr. Linnell, Leckhampstead.

The best hunting-like gelding or mare, above four or under five years old.—Prize given by J. G. Hubbard Esq., M.P. £5, Mr. Elias Clark, Lillingstone Dayrell.

The best hunting-like gelding or mare, above three and under four years of age.—Prize given by J. G. Hubbard, Esq., M.P. £5, Mr. R. Treadwell, Shalstone.

The best yearling nag, colt or filly.—Prize given by Mr. R. Treadwell. £3, Mr. John Simpson, Pottersbury.

SWEEPSTAKES.

For the best nag, colt or filly, above two and under three years old.—First prize, Mr. W. Chapman, Westbury; second prize, Mr. T. Barge, Hillesden.

SHEEP.

JUDGES.—Mr. R. Doig, Lillingstone Lovell, and Mr. William Reeve, Passenham.

The best half-bred shearling ram.—£1 10s., Mr. R. Treadwell, Shalstone.

The best ram of any age or breed.—£1 10s. Mr. R. Treadwell.

The best ten Down ewes, that have suckled lambs up to June 20th.—£2, Mr. James Bennett, Stowe Castle.

The best ten long-woolled ewes.—£2, Mr. Thomas Chapman, Westbury; £1, Mr. John Treadwell, Radclive.

The best ten half-bred ewes.—£2, Mr. A. C. Swain, Radclive; £1, Mr. C. Bennett, New Inn Farm, Stowe.

The best ten half-bred theaves.—£1 10s. and silver cup, Mr. Thomas Ridgway, Bourton Grounds.

The best ten ewe lambs, of any breed.—Prize given by C. Pilgrim, Esq. £2, Mr. John Treadwell, Radclive.

PIGS.

The best boar, of any breed, under three years old.—£1 10s., Mr. B. Lines, Water Stratford.

The best sow, of any breed, in pig or with pigs at her side.—£1 10s., Mr. Lines, Water Stratford; £1, Mr. C. Bennett, New Inn Farm, Stowe.

C H I P S.

III.

In No. I. of the present series we detailed in briefest fashion some of the principal points connected with the saving or what has been called the manufacture of manure, or farm-yard dung: what remains of the subject we now propose in the same fashion here to take up, this having reference to the employment of it upon various soils. The degree to which the fermentation should be allowed to go will depend, or should depend, upon the nature of the soil we apply it to. We have alluded to the chemical value of dung; but another property, and that a highly-valuable one, is the mechanical. This property is brought into play in the case of heavy clay soils. These being close in texture, and in many cases almost impervious to water, it is necessary that they should be opened up, as it were, and made porous, so as to admit the atmospheric influences to soften, mellow, and pulverize it. Hence for soils of this kind it is almost impossible to use dung ju too fresh or "long" a condition; it should be used indeed, in the heaviest class of soils, before fermentation sets in. And it is, as Professor Tanner remarks, very satisfactory to know that all the chemical changes brought about by means of fermentation are brought about after the fresh dung is ploughed into a heavy clay soil—"far more perfectly than if we retained it under our own control"; and, further, that there is not the least danger of loss from imperfect fermentation, for the absorptive properties of the soil guard with jealous care all the products of decomposition, and preserve the same until yielded up to vegetation. Nor is it less satisfactory to know that fermentation going on within a cold, clay soil induces that heat which tends to raise their temperature. But when we have to deal with light, sandy soils, a very different condition of the manure is required. Being light, and in many cases over-porous, consolidation of the soil is required; so that well-rotted manure, or "short" dung, as it is termed, is what is wanted for this class. It is a curious circumstance, that while the mechanical requirements are met by thus using short or highly-rotted manure for light and sandy soils, the chemical requirements are also met. Light soils, unlike heavy ones, pass water and moisture with facility, so that the fertilizing matters in the manure supplied to them are apt to be readily worked out of them and passed to the subsoil or to the drains; hence the advisability of having the manure well-fermented previous to its being ploughed into the soil, and applied moreover just before the crop is put in, so that the plants will begin to draw upon the manurial agents in the manure as soon as possible. In cases where the manure is applied as a top-dressing to grass lands, our authority states that he prefers it moderately rotten, especially if applied early in the winter; that the later it is applied in the winter the more rotten it should be. Professor Voelcker has shown that the loss sustained by spreading manure over clay land, and allowing it to be exposed for some time, is very inconsiderable. This, as we stated in No. I., is, however, corroborated by other authorities, as, for instance, Mr. Baldwin, whose opinion we shall presently give. Dr. Voelcker founds his belief upon the results of his experiments, which go to show that the loss sustained by farm-yard manure does not arise from the evaporation of its ammonia, but chiefly by the washing out of its valuable constituents by the rain, that is when it is exposed in heaps in the corners of the fields, or in uncovered badly-

arranged pits in the farm-yard; and that, in place of putting it in heaps in the fields, it is better to spread it out at once over the surface, because then fermentation is stopped, and the soluble matters, if soaked out by rain, are washed into the soil. "In the case of clays," says the Professor, "I have no hesitation to say the manure may be spread over six months before it is ploughed in without losing any appreciable quantity of manuring matter." On this Mr. Baldwin remarks that he could well understand the soundness of the Professor's views of the valuable constituents if the manure spread over the ground were at once washed into the soil by showers, and if fresh showers fell in proportion to or at the time of the formation of fresh supplies of ammonia. But a little consideration will show that this fine adjustment of showers of rain to the ammonia produced will not be obtained in practice. Mr. Baldwin maintains that the theories of Dr. Voelcker are not tenable, which hold that manure contains a "mere trace" of ammonia in a state ready to be dissipated in the air, and that during the fermentation of manure "the total amount of nitrogen scarcely suffered any diminution." Mr. Baldwin points out that in a ton of well-rotted manure there are 1.03lbs. of ammonia in a free state, and in fresh manure .76; while of ammonia in a form of salts easily decomposed by lime there are in a ton of well-rotted manure 1.27lbs., and in fresh 1.97. Mr. Baldwin further maintains that, if spread on the ground in dry and warm weather, all the free ammonia would escape. The per-centage of this, or the amount of it in a ton, is certainly small; but if one looks at the amount in a usual application per acre—say 20 tons—the figures mount up rapidly. Thus in 20 tons we have 15lbs. of free ammonia, which at 6d. per ton gives 7s. 6d., which, as Mr. Baldwin says, the farmer would consider a "crushing tax." One point of practice is, at all events, worth noting here—that the practice of spreading out dung is increasing, and that in some districts the after-crops have been proved to be better in quality and greater in quantity than where the opposite mode has been adopted.

IV.

The management of *calves* has formed, and, we need scarcely say, forms more than ever one of the most important departments of farm economy; yet, like many other branches of practical agriculture, much diversity of opinion exists as to the best mode of securing the best results of good management; or, to put it in another way, farmers disagree much as to what really constitutes good management. Some insist upon the calf being milked by its mother, as being the most natural, and therefore the most economical way to proceed; others maintaining as decidedly that this mode is as wrong in principle as it is bad and wasteful in practice. Some maintain that the mother's milk, if not allowed to be taken from her by the calf itself, should at all events be given to the calf by hand; others insist, upon the contrary, that the best results are obtained by feeding the calf upon artificial food—the nature of this again giving rise to a contrariety of opinions as to what should or should not be in it. Who can, therefore, decide where doctors disagree? it may be asked; while good service may be done in glancing at the varied practice of the farmers of modern times, which we propose doing in another "chip." We meanwhile content ourselves by making the subject of the present one a

resumé of what Professor Tanner says on the subject, in a very elaborate paper published in the "Journal" of the Bath and West of England Society. This able authority sets out by pointing to the fact that nature has provided in the milk of the mother a "perfect food" for the calf. Taking the analysis of milk as given by Madlein as follows—

Water	87.24
Butter	3.00
Milk-sugar	4.49
Casein	4.80
Phosphates of lime, magnesia, and iron	0.35
Chloride of potassium and sodium	0.17
Soda combined with casein	0.04
	100.00

—we see among its various ingredients substances destined to perform the various offices in supporting the life, building up the frame, and forming the tissues of the animal. In the butter and the milk-sugar we find highly combined compounds fitted to keep up that supply of warmth and to supply that free respiration so essential to the healthy development of the young animal. In the casein we have a nitrogenized substance, useful in forming the flesh and tissues; while in the phosphates of lime and magnesia we have those which build the frame and strengthen the bones. In the iron we find a substance which will afterwards be present in the blood, as will also be the case with the alkalies and the salts. If, then, an artificial food is to be used in preference to the natural food of the mother, this is the model we must have in view when we make it. But here we interpolate a caution of our own, which is probably worthy of some attention; and this is, that however closely the ingredients of any artificial food may resemble those which analysis shows to be in the natural milk, and however carefully the proportions may be attended to, it will be altogether erroneous to suppose that the artificial food will be as valuable for healthy feeding purposes as the milk of the mother. The best imitation that man can make of any of nature's products must of necessity be of lower value than the original. This, indeed, is involved in the meaning of the term "imitation," which must at the best be always an approximation merely to the thing imitated. It is a dangerous fallacy—and one which lies at the root of much of the false practice of the present day—that chemical analysis alone is all that is necessary to make known the exact nature and value of feeding materials. The chemist, by his test tubes and his scales, may eliminate and weigh to the minutest point the ingredients and proportions, say, of a turnip; but what chemist, with his finest skill, can, with these very ingredients, bring back the vegetable to its original form? There is a subtle something—the hidden link of a chain which binds all together—ever eluding man's skill. It is well that man should be thus kept humble, by ever appearing to be about to cross the threshold of the house of life to gain its important secrets, but ever stumbling, and never crossing. The very point which he may deem trifling and of no value may just be that which constitutes the whole value. Chemists, for example, tell us that the water existing in a vegetable is of no value, and therefore is put out of reckoning. Who can tell? Perhaps the water, in the peculiar form in which it is present in the produce, is the very substance required to bring into play the nutritive qualities of the other constituents, without which they would be inert. In the absence of proof to the contrary, it will be wiser to believe that water has an important office to perform, otherwise it would not be present in the plant. Every substance in every produce does play an important part, whether we know it or not; all are, in one sense, separate and independent of each other; yet all are linked together in a bond of closest intimacy.

We talk of playing "Hamlet," and leaving out the Dane; but where all the characters are unknown, who can tell which is the Dane? Better to take the rôle complete as it comes from the Master-manager's hands. To return to the more immediate matter in hand—not that we deem any apology necessary for this digression, which, whatever may be said for it, it cannot be said of it that it is altogether unsuggestive. Professor Tanner next refers to the two modes of giving the calf its food—by allowing it to suckle the mother, or by giving it the mother's milk by hand. Of these two, he is a decided advocate for the first of these two methods. The milk being the same, surely the way in which it is given cannot be of much importance. "Yea," says the Professor, "it can; and careful observation will readily enough prove that the suckling process, while it is the natural one, is the best—nay, the best because it is the natural one. The stomach of the calf is, like that of the maturer animal, divided into four compartments; but these are not all brought into use in the early stages of its existence. If, then, allowed to drink freely, the milk is passed into the stomach at a rate much faster than the digestive process goes on, so that it becomes deposited in the rumen, and entire disarrangement of the digestive process is the result; but, by the process of suckling, the passing in of the milk is gradual. Moreover, we do not know, but we may almost guess with certainty, that the pleasurable emotion raised in the animal by the process of suckling has a most beneficial action upon its health. Nature does nothing in vain: she has no superfluous arrangements. When will this truth be recognized and acted upon? But in addition to the advantages obtained by allowing the calf to suckle the cow, we should not forget that we also obtain advantages by the process promoting the comfort, and, in the comfort, the health of the mother. Still further, we find—as a further inducement for farmers to follow the dictates of nature in the suckling of calves—that the milk of the cow, immediately, and for some short time after calving, is of a quite different nature from that at ordinary times. In this condition—known technically by the name of "beistings"—it exercises a most beneficial influence upon the digestive organs of the calf. It is, in fact, a medicine admirably suited for the condition of the calf at its earliest life—kindly provided by nature. But we must say (it, indeed, a harmless joke is here permissible) the medicine must be taken out of nature's bottle by the patient itself. To sum up on this head, Professor Tanner says: "There is no plan so well calculated to promote the health and development of a calf as allowing it to suck the cow."

Another important point in the early management of the calf is the giving only of liquid food. Solid food is often given, but it is invariably attended with loss of ultimate condition, for by it those stomachs which are not intended by nature to be brought into early use are so brought, and by consequence weakened. The best breeders, the Professor notes, give their calves liquid food for so long a period as eight or ten weeks. If the advantages or supposed advantages of the solid ingredients of artificial food are desired to be given to the young calves, let them be given as recommended by our authority, through the medium of the mother. Feed her upon them, and the calf will not lose them. Where milk is given by hand, in addition to the losses we have noticed already as resulting from the practice, there is another which is likely to be also brought about, and it arises from the temptation there is to give up, after the first two or three weeks, the use of the milk as it is taken from cow, and to substitute for it skimmed or scalded milk. The result of this is that the animal afterwards is sure to be "a rank coarse-boned" one, arising from the milk having a superabundance of bone-producing constituents, and a lack of fat-producing matter. This last fault brings

with it moreover another evil, for in proportion as the fat or respiratory compounds are reduced, so in like manner is the warmth of the animal reduced, and in proportion also its growth. This will also prove the importance of having good shelter for the calf. Exposed as it is too often shamefully—shall we not rather say shamelessly—to cold and wet, the animal is sure to suffer, and the master's pocket also; only for the latter we do not care a jot, for he deserves it, and far worse than that. We

have no sympathy with the cowardice of cruelty. Together with good shelter, exercise must be provided for the calf, that of course of a well regulated character; this exercise enables all the parts of the body to be duly developed. Such is a rapid *resumé* of what our authority has said on this important subject of rearing calves up to the time of their weaning; and if attended to, he pledges himself the "best results will be obtained," but if disregarded "the consequences cannot be satisfactory."

MOUNTAIN RIVER IMPROVEMENTS.

In our Highland districts the narrow strips of land on the banks of the rivers often possess a higher value than they are intrinsically worth, because they furnish bread corn to the inhabitants, and thus save the expense of buying it from a distance. Improved roads and methods of steam conveyance have brought many of our Highland glens and habitations nearer, as it were, to the corn-growing farms of the low country than in the olden time; but in doing so they are at the same time increasing the value of their animal productions, so that they still maintain a higher comparative value than were the whole country subject to the plough.

It is no easy matter defending these highly picturesque and valued spots of land from the irresistible fury of the swollen torrents that roll between them during heavy storms. To all who are versant with the force of a large volume of water flowing down a steep incline, the surprise is that an inch of land remains on either side on which the foot of man can find a safe resting-place in a thunderstorm, when all around re-echoes the impetuous fury of the water elements, that foaming rush down the hillsides and ravines, swelling the accumulating force of the gathering deluge that irresistibly rolls below; and for a similar reason all who are thus qualified to form an opinion on the subject must equally admire the manner in which Nature stretches forth her powerful arm to rescue these sacred spots from the apparently inevitable ruin with which they are thus threatened.

It requires a clear eye and a comprehensive mind to see practically the details of the subject throughout its length and breadth, even under ordinary circumstances. If we go, for example, to what is usually, but fallaciously, termed the fountain-head, that bubbling issues out of the hillside, forming a basin out of which the infant river gently flows, we there behold Nature antagonistically balancing certain forces against each other as it were, but giving to one pet force, so to speak (*i.e.* the infant stream), an advantage over its rival, so small as if purposely to prevent it doing harm to the fertile strips of land on either side, as if they were intended by her to form for the time being a sort of Paradise for our fallen race; and from the fountain-head of the river to its confluence with the ocean we see throughout its whole length the same laws of Nature beautifully exemplified in order to prevent the washing away of the lands which otherwise would inevitably take place.

It is to these laws of Nature and the *modus operandi* in which they are carried out into effect that we wish chiefly to turn the reader's attention in this short article, our object being to show the absolute necessity of attending to those laws in the improvement of rivers in mountainous districts. The water that bubbles up in the bottom of a spring well on the mountain side, or that issues in a flowing stream from the crevice of a rock or the like, does so in obedience to the law of gravitation, thus proving that the true fountain-head lies at a higher level. In short, the bursting clouds on the hill-top are the true fountain-head of the river. When the rain-water collects in the fissures of the rocks of which the mountain is chiefly composed, the hardness of the rock prevents its being washed away. In cases where the rock is soft, large caverns are eventually made, from the washing away of the soft materials of which the rock is formed. When the water again falls from a considerable height over the ledge of a rock, forming a "lin," "tarn," "waterfall," a basin is partly scooped out below, and partly formed of the materials thus scooped out by the force of the water; and this scooping-out process continues to go on until the depth of the water in the pool is suffi-

cient to counteract the downward force of the current. In other words the hydrostatic pressure of the water in the pool counteracts the force of gravitation of the waterfall. When the water rises up in the bottom of a well, the hydrostatic pressure of the water in the well counteracts the upward force of the bubbling stream, and thus prevents the washing away of the soil. Now, although in these two examples there is an apparent difference, the laws of Nature are in both cases similar, the only difference being that in the former case the water is seen flowing into the pool or basin, whereas in the latter its descent into the pool is invisible, the stagnant water in the porous soil rising to the level of the surface of the water in the well. In principle, therefore, the two cases are identically the same, the hydrostatic pressure of the water in the pool counteracting the force of gravitation of the waterfall or flowing stream, thereby preventing the washing away of the soil, which otherwise would be the inevitable result.

The two laws in question thus involved in the natural formation of mountain rivers may be, and are, in point of fact, very instructively illustrated by pouring water into a tumbler from a decanter. When the water is poured into the empty tumbler it strikes the bottom with a force directly as the height from which it is poured; but as the water rises in the tumbler the force against the bottom becomes less and less, from the counteracting hydrostatic pressure of the water upwards, until the influent current eventually ceases to reach the bottom, the upward force being greater than the downward one. The experiment is a very simple one, and highly instructive in every agricultural class-room where this branch of agricultural science is experimentally taught; and those of our readers who are still apprentices to their profession, and consequently students, should perform the experiment in all its diversified details, so as to comprehend thoroughly the practical lesson which it teaches.

If the channel of a mountain stream is examined, it will be found to consist of a series of inclined planes and basins, forming pools and rapids from its source to its confluence, the series consisting of a rapid and pool alternately. Thus if we take the example of a spring well on the hillside, or at the bottom of a hill, as the assumed fountain-head of the river in common parlance, then the standing water in the well and the trickling of the water through the porous strata of the hill into the well form the first couplet in the alternating series. The water flows up into the well generally at the bottom, with a considerable force rising upwards above the surface, giving rise to a small ebullition or it may be a jet or spout several feet high. The water, on the contrary, issues from the well in a comparatively placid state, flowing down an inclined plane with an accelerated velocity into the basin immediately below; this inclined plane and basin forming the second couplet, or rapid and pool, in the series. In this manner the river continues to flow down rapids into pools throughout its whole length, leaving the upper pool with what may be termed a minimum velocity, but entering immediately below with a maximum velocity.

It will thus be seen that in the natural formation of mountain rivers certain laws are attended to with scrupulous exactitude, and in their artificial improvement or formation, the same laws of Nature being in force, they must consequently be respected with equal fidelity. It follows, therefore, that the natural example forms a pattern in every case for art to work by or imitate in the improvement of rivers of this class or the formation of new channels, and that unless the pattern which Nature thus gives is closely imitated or copied, those who thus

disobey her laws will be punished according to the magnitude of their transgression, by having their lands washed away until Nature forms a new channel on sound philosophical principles.

How oft have Nature's Laws been violated in this respect! The humbling facts of the case may best be left to bespeak their own reproof in all our highland districts. When examined in the light of experimental philosophy, they unquestionably read the advocates of professional education for the rising generation an instructive practical lesson. In a former paper it was shown that the geometry of a ditch or river in comparatively level ground involved the elements of the fifth proposition of the first book of Euclid, *alias* "Pons asinorum;" and we may here pause to ask the reader, How many highland lairds there are, who in the formation of ditches and rivers have practically, as it were crossed with flying colours "the bridge of asses" (Pons asinorum)? And the obvious reason why so many of them have wet their "tartans" is because they have never studied the laws of Nature exemplified in pouring water into a tumbler, and how those laws are to be loyally observed in the drainage and improvement of their estates! The case is, practically speaking, a very clear one, and therefore we may with becoming propriety leave it to stand upon its own feet; for in theory straight channels with uniform inclinations and flowing rivers must be admitted as sound doctrine, the natural rule of pools and rapids resolving itself into the practical question of preserving the channel in accordance with the theory at issue. In other words, if the channel of a mountain river can be straightened and preserved in a uniform inclination, such is unquestionably its proper form, as it will carry off the greatest quantity of water in a given time and in the smallest sectional capacity of channel.

In straightening the channel of a mountain river or open ditch of considerable inclination, its preservation in the above form is therefore a cardinal question in practice. The too common plan is to leave the newly-formed straight channel to take care of itself, both sides and bottom! in which case Nature commences her own plan of pools and rapids, in order to incur the least possible havoc and sacrifice of land. The unsightly work that in too many cases follows need not be told to those who are practically versant with the matter, for we have seen a ditch only three feet in depth cut down in a few seasons to the rock lying at a depth of more than a hundred feet below the surface, thus forming a huge ravine in itself "a small highland glen."

The true plan in all such cases is for Art and Nature to co-operate together in the improvement of the river; and in order to do so effectually, the draining engineer requires to investigate maturely the practical details of the work, before he commences to break the surface and divert the river from its old

channel. In all such undertakings we ourselves have found, from considerable experience, that book-rules are of no use in the vast majority of cases. In other words, every case must be its own rule. When the bed of the river only requires to be repaired the old one may be taken as a practical rule, or rather pattern to work by, as formerly stated. But when the channel is either straightened or narrowed, then this old rule does not wholly apply. Thus, in the former case, for example, the channel is shortened and the inclination increased, consequently the velocity and force of the current are also increased. Hence the greater havoc which the bottom and banks sustain during the first flood. In the latter case, again, the depth of the river is increased, by the narrowing of the channel, which also increases the velocity and force of the current, so that the ultimate result is similar to that of the former case.

The natural rule or pattern which Nature gives to work by is to increase the depth of the pools, as the velocity and force of the current are increased, and to decrease the inclination and length of the rapids. In the latter half of the work much depends upon the quality of the materials of which the channel of the river is formed. The natural rapid is formed by the accumulation of the largest stones forming a bar across the river, and where there are not many large stones Art may co-operate with Nature by throwing large stones into the smooth water above the rapid, so as to increase the height of the incline and depth of the upper pool. But by doing so the lower pool will be endangered, and hence also must be deepened in a similar manner, otherwise the stream may break through and leave the channel the first heavy flood. And so on until the natural equilibrium is restored throughout the whole series of pools and rapids involved in the work of improvement. In cases where rocks crop out in the bottom, so as to form a rapid, advantage may be taken of them to effect an equilibrium of all the pools and rapids below.

In the formation of a new channel, whatever may be its size, whether that of a small ditch or drain, or of a large river, wires of rude mason-work may be formed across the stream at short intervals, so as to form either artificial pools and rapids, or pools and waterfalls, thereby preserving the channel of the drain, ditch, or river in its original form or shape; and in all examples of considerable inclination this method of co-operating with Nature should never be neglected at the outset. The practical rationale of this need hardly be told, as the expense in the outset invariably amounts to only a small fraction of what it costs in the long run, while the destruction and sacrifice of land are avoided. By thus co-operating with Nature, the pools and rapids and pools and waterfalls thus formed by Art will not only preserve the channel in its original form, but also greatly add to the beauty and value of the river.

THE PRODUCTION OF ENGLISH CHEESE.

STR.—The manufacturing of English cheese is daily becoming a most important question. The price of cheese is yearly advancing; and may I ask in what way it may be accounted for? Is it by reason of the consumption being greater, or by the principle of a decrease production?

We have heard much of the American cheese, and we are well aware it is very largely imported into this country. Notwithstanding the supply from America is increasing, the scarcity exists, and extends. Amongst the supply some can be found "quite the cheese"; but we are burdened with the thought that the whole supply is becoming more inefficient to provide, and more inadequate to supply, the wants of an ever-increasing English population. While I acknowledge the home consumption and the supply from abroad to have increased, I cannot but lament that the production of English cheese has been on the decrease. In these remarks I make especial reference to the midland counties. I am unable to speak with any degree of confidence of the dairies of Cheshire, Gloucestershire, or other cheese-making counties; but of dairies of the midland counties I do say that, during the last twenty years, there has been a gradual, though now it has assumed the form of a radical, change. In my own parish there is 67 per cent. less cheese made than twenty years ago; and many other parishes in Leicestershire are at as great if not a greater ratio.

The cause of this change in the farming of these counties is to be attributed to the advance and altered mode of living of agricultural society. One main reason is the anxiety, trouble, and annoyance of cheese-making in the household. We readily admit the impossibility of the mistress obtaining the three household requisites of neatness, cleanliness, and regularity, when the business of making cheese is performed in what should be a private house. The other reason which I may mention lies with the dairymaid. This personage and the milkmaid, which our ancient poets did so much to celebrate, are fast losing that renown which was formerly attached to them, and, I am firmly persuaded, will soon be of the past. The dairymaids that are to be obtained are chiefly of that class which requires the strict eye of the mistress to make cheese-making successful. It is a notable fact that the breed—if I may be allowed to use such an agricultural expression—of dairymaids is yearly diminishing. I think the time is far distant when cheese-making apparatus—although I far from overlook the usefulness of many—will be very generally adopted by Leicestershire farmers. Unless there is some system pursued by which it can be manufactured independently of the farmer's private residence, I see no other than that the making of cheese will continue on the decline.

Will it serve the best interests of the country for cheese-making to be discontinued? I think I may say, for many rea-

sons, it will not. Without cheese-making we should be struggling against a scarcity of stock. It is clearly perceptible that an abundant supply of stock is co-existent with the dairy, and *vice versa*. Is it not probable that the present cry amongst farmers, of the dearth of store animals, may be accounted for in this way? If all will be feeders and none will be breeders, we shall no longer be independent of other countries for our supply of either stock or cheese. Dairying is objected to by some on account of its impoverishing nature; but, with liberal feeding and an occasional dressing of some fertilizer, this ob-

jection may be overcome, and the profit remaining may be handsome. If, then, it is desirable that cheese should continue one of the principal products of British agriculture, what system can be adopted to promote that desire? I say firmly, but emphatically, the American. The various cheese-making apparatus might be used with great advantage; and the economy in power for pressing, and the saving of labour, in an establishment on a large scale, might be such as greatly to reduce the cost of making. Yours, T. J. S.

SACCHARIZED GRAIN FOR FEEDING PURPOSES.

STR.—Since my last letter appeared in your widely-circulated journal on the properties of saccharized grain for feeding purposes, I have been inundated with letters of inquiry from gentlemen in all parts of England, and from France, as to the manner of preparing the grain. Herewith I inclose you a description of my method of saccharizing wheat and barley, by doing me the honour to print which in your next copy, you will greatly oblige me and will be doing a very great service to every British stockmaster.

A malt-kiln is not required, neither does it appear that grain as prepared by me is subject to excise laws.

Germination of grain is much influenced by temperature, hence difference of summer and winter fabrication. A difference of management of wheat and barley is also required.

WINTER SACCHARIZATION OF WHEAT.—Steep 48 hours, drain off all loose water (24 hours are required for drainage), spread the grain 12 inches deep in heating box, and cover with cloths: avoid all lower currents of air. Heat generated, which occurs in about 24 hours, and a smell similar to fresh-drawn cider, are guides favourable to the process—diastase is generated, and a sprout is about to form. A putrid, sour smell is to be strictly avoided; a fungus will be the result of this change, and one end of the grain will be found brown-black in colour. Immediately a sprout is seen outside the grain, turn the germinating heap into box No. 4 and spread 6 inches deep, turn from box 4 to 5, and so on every 24 hours, and the process will be effected in from 10 to 12 days. The grain of 1864 required as many as 18 days to effect a similar change.

SUMMER SACCHARIZATION OF WHEAT.—Steep 40 hours, drain as in winter, spread seven inches deep in heating box (no cloths are required for summer), closely observe the heat and smell as before alluded to: if too much heat and no sprouts are formed, furrow the mass, done simply by forcing a blunt piece of wood through it (a process which malsters call ploughing); sprouting commenced, turn into box No. 4, and repeat the turning every 12 hours, spreading the grain four inches deep. Here will be observed the difference between summer and winter management, and that double space is required in summer for the same quantity.

WINTER SACCHARIZATION OF BARLEY.—Steep 50 hours, and even 60 if the grain has been harvested in a very dry summer; drain the grain 24 hours, spread 18 inches deep in heating bed, and cover with cloths. Observe the same heat, smell, and stage of germination as in the wheat. Turn from box to box every 24 hours, spreading 10 inches deep. Barley during winter requires little turning; it may, indeed, remain in box No. 5 until fit for use, that is until the sprouts begin to clasp each other.

SUMMER SACCHARIZATION OF BARLEY.—Steep 48 hours, drain 24 hours, spread 11 inches deep in heating box, 4 inches in other boxes, turn every 12 hours, observing more frequent turning in summer than in winter. It will be fit for use in from 8 to 10 days.

The water must be clean and changed for every steep.

Double space is required for summer as for winter fabrication.

Steep enough at one time for three days' consumption; for example, for 64 sheep three bushels; this quantity will give each sheep one pint daily for three days.

Immediately one lot is taken from the steep, place in another sufficient for three more days, and then a third immediately the second is removed from the water, and so on until all the different compartments are occupied and so regulate the supply to the demand.

To germinate grain in summer much more attention is required than in winter; high atmospheric temperature so much

influences the saccharizing process (wheat especially), dextrine being formed, and turning the grain not being attended to, it exudes from the surface of the grain, which, with the decomposing albumen and gluten, causes the heap to become one adhesive and putrefying mass.

The more the grain is drained after removal from the steeping-tub the more kindly it will germinate: the draining-vat requires elevating from the ground.

Wheat in germinating increases one-half, barley one-third in bulk.

Where roots or grasses are used and sheep require fattening, each sheep may have of germinated wheat one quart, of barley three pints daily, mixed with chaff.

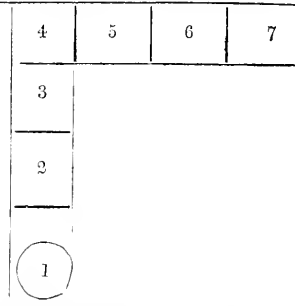
Germinated grain is a perfectly harmless food, hence its greater value over all other feeding stuffs. After a week's feeding a sheep may consume half-a-peck daily, and not be injured; the youngest lambs may eat of it with safety.

The boxes, as shown in the plan, are very important. The same depth of grain can be kept at the sides as at the middle of the heap, and the grain requires but little stirring after being taken from box No. 4.

The grain requires to be only half the depth in Nos. 4, 5, 6, and 7 boxes, as in No. 3, the heating-box; heat is spontaneously generated in No. 3 box. The grain in the heating-bed only requires covering with cloths, and in this only during winter, unless from excessive cold germination is checked: in that case the grain requires covering in any of the beds or laying of greater depth.

It was when my experiments were limited to the feeding of a few scores of sheep, and during winter, that I found boxes so extremely useful in procuring saccharization of the entire bed; but now that saccharized grain is becoming so extensively used (on one farm alone 14 sacks per week are being consumed, and another flockmaster is making arrangements for preparing 40 sacks per week), it has been found more convenient to work the grain during the saccharizing process upon a floor.

PLAN FOR SACCHARIZING SMALL QUANTITIES OF GRAIN.



1. Macerating tub; 2. Draining-vat; 3. Heating-box; 4, 5, 6, 7. For working the germinating grain.

The boxes should be of a size to hold just enough for three days' consumption—3 feet square, 11 inches deep will hold 4 bushels of raw grain. Only have boxes of proper size, and the smallest quantity of grain, even a quart, can be germinated. The boxes are made simply by placing an 11-inch deal upon the edge from side to side of a floor, and the space so formed intersected by other pieces of deal of the same depth (see plan).

Yours, &c., ISAAC SEAMAN.

Priority House, Saffron Walden, Sept. 16, 1865.

THE CATTLE PLAGUE.

BY A PRACTICAL FARMER.

There cannot be too much written or too much said with the view of rendering the whole community extremely cautious and careful to prevent the spread of this awful pest—"The Russian Cattle Plague" ("German Rinderpest"). It is worthy of all praise to find that the whole British Press takes the question up and discusses it so fully. We don't care for a few exaggerations. It all tends to inspire caution. We all want to stop the further spread of the plague, and it cannot be more readily done than by the diffusion of the details of its ravages, through the Press. Orders in Council and public meetings are all right and proper, and their orders and proceedings highly commendable; but it is the Press—the diffusion of the knowledge of the dire effects of the plague—that will put the British public on their guard. I acknowledge, indeed I know, there has been gross exaggerations of the progress of the pest, and of individual losses more particularly; but it has had a good effect. Every grazer and cow-keeper is fearing the attack, and is preparing to withstand or frustrate its evil powers. And this is all they can do, for we learn the disease is incurable, and a very alarming announcement it is. It is not meant, however, by this word "incurable" that no animals will be restored to health after the attack, but simply that no application of any remedy nor any treatment known in veterinary practice is of any avail. And this is my great object in penning this paper. There is no correct treatment or remedy for the disease, known in veterinary practice. What, then, is to be done? Why, all depends upon isolation and good nursing. What is the first course? It is this: The instant any animal shows signs of unusual languor, staring coat, drooping ears, and running eyes, put it aside, and send for the farrier. If the farrier cannot clearly decide what is the matter—that the symptoms are new and novel—by all means get to the best possible nursing—*i. e.*, warmth in cold weather, coolness in hot, good ventilation and cleanliness, and the efficient use of disinfectants. Lime, gypsum, or chloride of lime, &c.—even brickdust or sawdust, or dry ashes, or earth—is better than nothing. Then as to food: If the animal will touch any, which is very doubtful, let it be of the best and sweetest kind, *i. e.*, grass and hay cut into chaff, pulped roots, bran, grains; nothing that is heating ought to be given. Then the chief hope is in unremitting attention to the frequent administration of stimulating drinks and nutritious gruels. For stimulating drinks use ale, whiskey, gin, brandy; ginger may be used freely. For cordials, gruels, and drinks, oatmeal, linseed, treacle, gentian, &c., is desirable, and as being in every farmer's possession; but the chemist would also supply some very useful and beneficial chemicals in aid, which ought also to be obtained and judiciously applied. Chlorine is said to be exceedingly applicable. The great thing to be guarded against is extreme prostration, which stimulants in large quantities can alone overcome. I have seen several cases, and some of them in their several stages—*i. e.*, the restored to health, the incipient disease, the fully developed and advanced cases, and the dying animal. Having seen this, I fear not to assert that every ordinary grazer, and I would almost say every ordinary veterinary practitioner, may be easily mistaken as to the symptoms of the disease. It is undoubtedly a very malignant kind of typhus or typhoid fever; but we have had typhus fevers often enough. The question, therefore, in each case will

be—Is it fever, or is it the cattle plague? I mean to say that it requires a first-class practitioner to decide in its earlier stages; indeed, I believe no one can tell till more developed. It is pretty manifest towards the last; but even then, claimants for compensation under some of these many excellent assurance societies ought to be compelled to obtain a careful examination by a competent practitioner, and receive his certificate as to the true cause of death. Nay, I would go further, and say that if it can be subsequently ascertained that the certificate was given wrongfully, *i. e.*, that it proved to be some analogous disease, but not the real "Cattle Plague," such error or mistake should be fatal, and the claimant must lose his right to compensation. I rejoice much to see the vigour and earnestness displayed in forming these societies. "Many can help the few." They will be great safety-guards, and it would be a gross shame to find them abused. To prevent this, competent members should bestir themselves in every part of every district, and take special cognizance of each member's herd in that precise locality, so as to be able to inform the Society of any suspicious circumstances relative so it. This would prevent any gross attempts at imposition; and moreover such members might confer with any sufferer as to the best way of disposing of any portion of the herd, in case of attack. For, be it remembered that large sums are raised, and large sums may be required in compensation cases. It is very certain that many fat animals from infected herds are good food for man before they are actually attacked. It would therefore be right to obtain an inspector's certificate of health, and send them to market. This, in all probability, would be a great saving both to the sufferer and the assurance society. These societies, too, should be placed on a sure footing, so that claimants may have a legal right to compensation, and the members be bound to pay such subscriptions as by their rules they engage to do. This can readily be done by inserting a copy of the rules in a book, to which is affixed a proper stamp, and every member signing that book is legally bound to pay accordingly. Besides, he, in addition, may sign a declaration by which he engages to comply with the rules, &c.

It would be superfluous to quote the very many directions and precautions that have been put forth by the Government and professional men. They are to be found in almost every newspaper, so that it is quite unpardonable for any respectable man to remain in ignorance of them, and it would be worse than madness to neglect or disregard them. The disease is so dreadful, so destructive, as to be of deep national importance. I think Government ought to insist upon direct information of the outbreak, in any district, or farm, or cow-keepers' sheds, or elsewhere, being communicated to them or their office—say 23, New-street, Spring-gardens, where Professor Simonds presides on behalf of the Government; and let a competent agent be sent at once to investigate the fact, and direct the course to be adopted. At present the arrangements are very unsatisfactory. The magistrates have power, under suspicious circumstances, to appoint an inspector for their respective districts. This inspector must be a duly certificated veterinary surgeon. Now, in my district we have but one duly qualified practitioner within a radius of some fifteen miles extent. This appointment must be thrown open to competent men, who practise the veterinary art,

and that without reference to certificates—the magistrates alone to be the judges of competency. As to compensation, I hold that in the event of a Government officer, who may be called to visit any particular district, finding it necessary to order the destruction of cattle so diseased, in order to prevent its further ravages, that it is the bounden duty of the Government to pay for such cattle. It is for the good of the country, and the country should bear the loss, not the poor grazier individually: he does not introduce or propagate the plague: it is sufficiently trying and grievous to him, without bearing his country's burdens. The disease is unique, the prevention should be the same. Much laudable effort is put forth, but it is not met fairly on behalf of the Government. I hold that the Government ought to render very efficient help to every well-constituted assurance society, and encourage in this way the establishment of more, so that the Government and the country work together. There may be imposition—what of that? It can't go to any great extent. Every society's officer will look after them, as well as Government employés. It is a most momentous case, and

must be met most promptly and unflinchingly. It is not a question of a few thousand pounds, or of a few hundred thousands. It is a question of a country's want—beef or no beef? It's no use "mincing the matter." The whole country may be devastated in a few months: prompt and comprehensive measures are imperatively required, and woe to the country if they are not at once adopted. The assurance societies will not stop it. I have been much engaged in the establishment of one of them. Why, not a tenth of the graziers have yet become members of it! I know it is usual for our British Government to leave these matters to the good sense of the community to rectify and overcome, and very right too. But we are now in especial difficulty, and need more than good advice—we want help. Let the Government declare by Order in Council that they will pay one-half of every compensation awarded by every well-organised assurance society, and great and I think most important results will follow. I know this: it will be of the greatest encouragement to every earnest working man, who, through these societies and otherwise, is trying his utmost to stop the cattle plague.

THE CATTLE PLAGUE AND ITS ORIGIN.

Mr. John Parkin, M.D., has written a pamphlet on the cattle plague, from which we extract the following:

"We may conclude that the bovine plague now prevailing in England has not been imported from Russia or any other country, and that it is of spontaneous origin. It only remains therefore to consider what cause can be assigned for the outbreak. On the solution of this problem will necessarily depend the measures that ought to be adopted for the prevention of the disease. Hence its importance, not only in a theoretical, but in a practical point of view.

"The first circumstance that demands attention, while entering on this inquiry, is the important fact that we are now living in an epidemic period, characterised by the advent of a new disease—the epidemic cholera; for, although attempts have been made to prove the contrary, no evidence exists of the prevalence of such a disease before 1817. There must therefore be a new cause in operation to have produced this effect; and, as a similar result—viz., the production of a disease, if not new, presenting, at least, peculiar and characteristic symptoms—has occurred in the bovine race, it would not be unphilosophical to infer that both effects are due to one and the self-same cause. We are strengthened in this conclusion by the fact that both diseases made their appearance in Europe in the same locality, viz., in Russia. We have not, it is true, had any account of the existence of murrain in the countries previously invaded by the epidemic cholera, with the exception of Egypt; but this exemption is easily accounted for. In India, and in the countries lying between that part of the world and Russia, very few cattle are kept. A casual death among them, therefore, would hardly be noticed; but it is different where large herds are congregated, and where the mortality would necessarily be in proportion to the number.

"It may be argued, however, that as the disease in the bovine race is different to the cholera, the cause productive of these different affections cannot be the same. To this I would reply, that the primary, remote, exciting cause of the epidemic cholera has not confined its influence to that single disease, but has evidently been productive of other effects, even in the human race. Since the advent of the cholera, another new disease has made its appearance, viz., diphtheria; while all the ordinary diseases, and more especially fever, have been regularly and gradually on the increase in all the countries invaded by this modern scourge. As these different diseases could not have been produced from each other, not only on account of the dissimilarity of the symptoms, but also because they have not prevailed at one and the self-same time; so we must infer, if there be any relation or connexion between them, that they are all due to the operation of one universal and common cause.

"Then, again, it may be said that the cattle disease has not travelled, like the epidemic cholera, regularly, and step by step, from Russia to England, some of the intervening countries having escaped up to the present time. But then it must be remembered that this is not the first murrain we have had since the advent of the cholera. The previous one, termed the lung disease, or pleuro-pneumonia, not only invaded the same countries in Europe as the cholera, but travelled regularly over the same lines from Russia to England. It first appeared in Europe in 1825, but did not reach this country until 1839, and was then confined principally to the thin-skinned and more delicate breeds, as the Devon. It reappeared in 1844, 1845, 1846, and 1847, occasioning great mortality in the latter year. In 1849 also, 20 per cent. of the cattle perished from the same cause, while it was again general in 1851."

After referring to the disease affecting the potatoes and other matters, he says:—

"According to these inferences, the cattle disease, so far from being an accidental occurrence, due to the importation of a few cattle from Russia, is one of the inevitable consequences of a cause that has been in operation for the last thirty years in Europe.

"Having arrived at this conclusion, the next question that presents itself is, What can this cause be? Unfortunately, this is a question that cannot be answered on the present occasion. In the first place, the majority of medical men conclude that the cause—the remote and essential cause—of epidemic diseases is unknown: while, of those that have a theory, scarcely two are found to agree on the subject. In the next place, having a particular theory of my own, I feel reluctant to refer to it, or to advance a single argument in its favour, on the present occasion, when facts only, and not theories, should be advanced. It will be best therefore to infer, for the moment, that the remote cause of epidemic diseases is still a problem.

"Although unacquainted with the remote cause, there cannot be much doubt with respect to the immediate cause. This is the presence of a deleterious agent in the atmosphere: as it is only on this supposition that we can account for all the phenomena observed at epidemic periods. Not that the poison is generated in the atmosphere: the effects produced are too limited in their range to admit of such an explanation. Observing this limitation, we can only infer that the agent is derived from some other source—one with which only a portion of the atmosphere comes in contact. Finding, also, that the poison is more concentrated at lower than at higher altitudes—epidemic diseases prevailing to a greater extent in the former than in the latter situation—we may also conclude that the poison is extricated from the surface of the

earth, along particular lines, and in certain spots of greater or less extent. These inferences granted, we may then understand the *rationale* of the measures about to be recommended for the prevention of the cattle plague."

As to "PREVENTION," he says: "When the epidemic is prevailing in the neighbourhood, and more particularly if it has broken out among the herd, they should be kept under shelter as much as possible during the day, and entirely so at night. Experience has shown that individuals exposed to the night air, during epidemic periods, are more liable to attacks than others. The reason, as we may infer, is, that the poison productive of all diseases, the same as that well-known substance called malaria, possesses a specific gravity greater than that of atmospheric air. Becoming rarified by the warmth of the sun, it rises into the higher regions of the air during the day, but again falls to the earth, when its rays are withdrawn."

"Although present in the atmosphere, the poison, as previously remarked, is not equally diffused in this fluid; it is in a state of greater concentration in one situation than in another. Hence it is that those living near the source of the extrication of the poison become affected, while those at a distance escape; the poison, by its diffusion and dilution in the surrounding air, becoming innocuous beyond certain limits—hence the limitation of range of epidemic diseases. The fact is still more apparent with endemic diseases; for we not only know the source whence the poison (malaria) is extricated, but the extent of its range. The source is all low, marshy, and alluvial soils, so that higher grounds are either partially, or, entirely, exempted from its deleterious influences. Thus it is, that, in tropical climates, the severest form of fever—the continued—will be found on the plains below; remittent, on the heights above; and intermittent—the mildest form of all—at still greater elevations. We do not find the same limitation of range with epidemics; the epidemic cholera having been met with at the highest inhabited ranges of the Himalaya Mountains—10,000 feet above the level of the sea. Still, their prevalence is less, and the limitation of their range is much greater, and more defined, at high than at low elevations. Geological formations have, also, some considerable influence, as regards the prevalence of disease. Hence I have laid it down as a law, regulating the march of epidemic diseases, that they prevail to the greatest extent in alluvial and tertiary formations, less so on secondary formations, and least of all on primary rocks."

"Whenever, therefore, disease breaks out among a herd of cattle, placed in low and marshy ground, they should, if possible, and if not in contravention to the orders of the Privy Council, be removed to higher ground—more particularly if there are animals, in the latter situation, among whom no disease has manifested itself."

"There is another rule that may also be adopted. It has been stated that the range of epidemic diseases is frequently very limited in a town; they are equally so in other situations. For instance, it has frequently happened, in India, that two corps on marching together, have encamped for the night on separate ground, but near to each other. The one has been immediately attacked with cholera; the other has not presented a single case. Observing this, the sick corps changes its encampment, and takes up a position alongside the healthy one. This is no sooner done than the disease ceases; the healthy corps also remaining unaffected, although the sick and the dying were removed at the same time. When, therefore, it is impossible to remove the cattle to a more elevated situation, another grazing ground, even at the same elevation, may be tried—more particularly if the test mentioned above can be obtained. There is no fear of the healthy cattle being infected by the sickly herd; the example just given will show this. The disease may, of course, break out in this locality, the same as others; but, then, this would have occurred even if the sick cattle had not been removed there. As, however, such a step would be contrary to the regulations at present in force, it will be necessary to remove the healthy cattle to another locality, previously to the removal of the sick herd."

"But all cattle are not kept in grazing ground; there are some, and more particularly dairy cows, in London and other large towns, which are stall-fed. The regulations that I should propose for these are the following:

"Do not admit more air than what seems absolutely necessary for the purposes of respiration; and let that air be admitted, to

use a nautical phrase, on the *lee*, *not* on the windward side of the cow-house. It but too often happens during the prevalence of epidemic diseases, that we are induced to exclaim with the poet:

"The Angel of Death rode by on the blast,
And smote in the face of the foe as he pass'd."

All the windows and doors, however, may be thrown open, and the place be properly ventilated for an hour or two, in the middle of the day, more particularly in warm weather, as, for the reasons previously given, there is less danger at that time than any other. It is the night air that is most to be dreaded.

"These are the only general measures that I should propose for the prevention of the disease; but we must not rest contented with these. There is another, more certain, and more specific method, that I should strongly advise the proprietors of cattle to adopt, whenever the disease is prevailing in the locality or in the neighbourhood. This is by the employment of one of the different forms of carbon, as recommended more particularly for the treatment of the disease. My faith in the efficacy of these agents is so great, that I have no hesitation in affirming they would, if properly administered and in sufficient quantity, preserve an animal from an attack, even in an infected atmosphere. To obtain such a result is of no slight importance at the present moment, when the proprietors of stock are recommended to slay their animals on the first outbreak of the disease—sick and healthy alike."

"Believing this step to be most prejudicial to the interests of the proprietors of stock, and injurious to the welfare of all classes, I cannot close these remarks without entering my solemn protest against this bovidial mania—if I may be allowed to coin a word. A Professor remarks, in a letter inserted in one of the journals: 'It is highly necessary to inform the public that the present scourge, unlike cholera and similar human diseases, has no tendency to die out, after a brief period of its extension. So long as *living* cattle are within reach of anything infected or diseased, so long must it go on; and it is chiefly by *wholesale extermination* of stock, that the last embers of the disorder will be consumed.' These conclusions, as must be evident from what has gone before, are not only unsound and erroneous, but they are prejudicial in the highest degree to the interest alike of the public and of the holders of stock. Not only is the cattle plague a true epidemic, but, what is more, it will subside after a time of its own accord, even if all the healthy and all the sick were mixed promiscuously together. If the disease be neither contagious nor infectious, it will be both a crime and a sin to slay a single animal that has been attacked, for as long as there is life there is hope. Besides, if this wholesale extermination of stock is to be carried out, whence are we to obtain a fresh supply? Russia has already had 100,000 head of cattle carried off, and although other countries in Europe have hitherto escaped, this immunity will not always continue. They also will be brought, sooner or later, under the malign influence of the same cause, as will also America, although not a single animal be transported thither from Europe. I would therefore say to the proprietors of stock, Use your best endeavours to prevent the disease; should these means fail, and some of your animals be attacked, think only of how they can best be cured; so that, if they die, the verdict may be: 'Died by the visitation of God'; *not* 'by the hand of man.'"

TREATMENT: As to the treatment of the cattle, Mr. Parkin says: "Although Professor Simonis tells us, in his Report to the Privy Council, that 'the experience gained in this country confirms Europe, as a whole—viz., whenever the plague breaks from its strongholds in Russia, and invades other countries, medical skill is powerless in arresting its progress by the application of curative measures,' I am ready to maintain the contrary. As the organization of man and of animals is the same, and as the diseases are nearly identical, there is no reason why the cattle plague should not be as amenable to treatment as typhus or typhoid fever in the human race. If such a result has not been obtained at present, it must be ascribed to the fact that the proper treatment and the proper remedies have not been hitherto employed. Convinced of the truth of this conclusion, I am induced to propose the following method of treatment, not only because I have found it to be the most efficacious in human subjects, but also from the fact that it has been adopted with success, both by myself and by others, in the brute creation—in the murrain that prevailed

some years since in England. This is by the employment of the different forms of carbon.

"As the gaseous form is that on which the greatest reliance is to be placed, I will first point out the best mode of its administration. As long as the animal takes its drink regularly and in the usual quantity, the gas may be diffused in the water, which can be easily effected by dissolving one drachm and a-half of bi-carbonate of soda and one drachm of tartaric acid in each pailful of water. If, however, the animal refuses its drink or takes it in less quantity than usual, the gaseous fluid must be poured down the patient's throat, or it may be given by enema. In this case, a smaller quantity of fluid should, of course, be employed; while, if an injection be resorted to, the water must be warm—98 deg. Fahrenheit, or blood-heat. One very good method of administering the gas by the mouth is, to pour a bottle of soda-water down the animal's throat, care being taken to prevent the escape of the gas. This should be repeated every two or three hours, until the urgent symptoms are relieved. If more convenient, yeast—brewer's yeast—may be substituted for the soda-water, or it may be given in combination with it. In the former case, half-a-pint may be given every three or four hours; in the latter, half that quantity. If a stimulant be required, as is the case in the latter stages of the disease, instead of the soda-

water, a bottle of porter, or ale, if old and *well up*, may be employed instead.

"In addition to the above, one of the other forms of carbon should be resorted to; and as we are only acquainted with carbon in its pure form in the diamond, we must employ those compounds in what it exists in the largest proportions, viz., in the hydro-carbons. The best is naphtha, which contains 85 per cent. of carbon. Two teaspoonfuls of this—the pure, medicinal naphtha—may be given every four hours, in mint or chamomile tea, and be continued until the subsidence of the specific symptoms—those characteristic of the disease. When the naphtha cannot be obtained, a tablespoonful of cod liver or olive oil may be substituted for it.

"As the object of this mode of treatment is to remove the cause rather than to remedy the effects, it should be resorted to at the earliest possible period of the attack. For the removal of the effects—the debility, &c.—the ordinary methods must be resorted to. I must, however, enter my protest against the employment of stimulants, excepting as a last resource, and in the last stage of the disease. The debility experienced at the commencement of the attack is merely the effect of the impression of the morbid agent on the system, and will disappear, in common with the other effects at that stage of the disease, on the removal of the operating cause."

CAUSES OF THE CATTLE PLAGUE.

SIR,—I am obliged for the insertion of my last letter on this subject, in which I attempted to show that the British modes of stock management were far more congenial to health than the foreign. At the same time it may be useful to enter a little more fully into the subject, just to see whether we do err materially, and, if we do, in what way our errors could be corrected.

Now, in examining the agricultural modes, I come to the conclusion that, in the country, we may err a little in economy, but that as regards the health of our animals we cannot greatly improve upon our plans. For instance, our cattle are kept during summer in the pastures, and are fattened during winter on roots, hay, cake, and corn; the greater portion of the stock being fattened in yards with open sheds attached. Now, here we have the cattle fed on green food and in the open air all the year. A small proportion are no doubt more closely kept, in boxes, stalls, covered yards, or on boards. But none are kept so unnaturally and unwholesomely as the dairy cattle in London—kept in close stables, or even in cellars, and fed on grains and distillers' waste; and, in Edinburgh, on sewage-grown grass, the result being a large product of very thin milk, produced at the cost of loss of health or even life to the cow, and perhaps to the injury of the consumer who uses milk from animals suffering from incipient lung disease, and in which the flow of milk is induced to an extent that may almost be considered a disease.

For sheep, our English custom is that of outdoor feeding; those few who have tried shed-feeding on the board system having left it off.

For pigs, we have the animals at grass or clover, or at "stack," while in a store state, or kept in open yards in winter on beet and beans; and then for fattening, barley meal with the house wash, and, when it can be obtained, skim milk. Is not this English system conducive to health in the animal and in the eater? Is there any comparison to be made between it and the foreign mode, where the swine-herd blows his horn to bring his gaunt animals to their mast and acorns? or to the Irish, where measles is developed in the animal by its residing in the cabin and feeding on potatoes? So far as the feeding is concerned, the Londoner cannot have more wholesome food than country pork and country sausages. Though he may well shun the garbage and graves-fed pork of London, and abstain from London-made sausages, whether of beef or pork.

As to fowls—the country fowl, bred in the open air, at the barn-door, in the stackyard, or in the yards, and finished by a few weeks' fattening on wholesome corn, must possess a flavour, a firmness, a nourishing wholesomeness, far superior to those cooped up with their own excrement, and crammed with grease and other nauseous mixtures.

The country modes are, in short, adapted to induce health in the animal, and to produce wholesome food for the consumer. They err against economy in a few minor matters—as, for instance, in feeding animals on such luxuriant grass as we now possess, or on turnips of too rapid growth, and, consequently, run to rapid decay; we ought to supply considerable quantities of dry food; and for sheep and cattle a constant supply of rock salt, to promote digestion and to correct any ill effects from too great luxuriance.

With plenty of dry food and salt, I am convinced we should hear little of the injurious effects of turnips on sheep, especially those grown with artificial manures. We often hear the complaint that we cannot grow so good turnips as our fathers, and that the new-fangled manures render them unwholesome. But is not the reason this—that our fathers grew turnips on new land and as a new thing, while our four-course system has made the soil sick of turnips. And artificial manures are injurious when applied on poor land which has not staple sufficient to carry on the luxuriant growth which the artificials have excited. On good land, or with the addition of plenty of farm-yard manure to carry on the growth, the results of artificials must be good.

We are apt to forget the original nature of our animals, to feed them too monotonously. If we put our sheep into a fine piece of turnips, it is enough. But the sheep is an animal that feeds on thriving downs and heathly mountains, and requires something to correct the turnip, which, the more luxuriant and the more free from weeds they may be, the more suitable are they for such an animal. Our pigs we fatten on pure barley meal and pea meal; we forget that the pig in his native state is omnivorous, that he is constantly on the lookout for grubs and larvae, and no doubt swallows large quantities of earth, which cures acidity and prevents eruptions. Therefore a small proportion of graves would be a useful addition, and, as Mr. Stearn suggests, a few coals or cinders for him to crunch, the sulphur or carbon, of which coals consist, being very conducive to health. For fowls, again—they, being natives of tropical countries, require warm and dry lodging; their food in their native state consisting of berries and insects, some small proportion of animal food must be useful where they have not a spacious run, and a mixture of something hot and condimental would be useful, especially in damp weather, to keep them in health.

Thus I have passed our British modes of feeding and fattening in review, without discovering anything that could cause the disease. Everything points to a foreign source. Alarmists have feared that pigs and poultry were suffering under similar diseases; but of this we have no proof, and it is probable that the complaint in fowls is the common pip.

For remedies—there are *plenty* and there are *none*; that is, there are none certain: we must look to preventives. I see many persons have recommended their peculiar manufactures, and no doubt all tonics are useful in supplying stamina. But probably a plentiful supply of salt would be as useful as any: we know how cattle flock to the salt-licks of America. Anything antiseptic or anti-fermentative would be of use, probably, in checking the progress of a disease which may owe its virulence to an undue predominance of ferment in the blood. Thus a small quantity of sulphuric acid in the water should be given, sulphur being a great enemy to all fermentation, and the acid the most powerful deodorizer we have. I might also urge the trial, as a preventive, of very homœopathic doses of arsenic—do not be frightened. A Mr. Bonar in his travels

in Bavaria discovered that arsenic cakes were numerous there, and that they who partook of them were plump, clear-skinned, and more able to withstand fatigue than others. The system might by that means be imbued with a substance that should render it impervious to disease of this nature. Inoculation, it is said, gives immunity from attack. Now, why should not our scientific men discover some substance which should act on the tissues in the same way as inoculation, and thus operate as a similar preservative? W. H.
Sept. 23.

[We give our correspondent's letter on the principle of hearing both sides of the question, although we by no means agree with the deduction he arrives at. There are many things in England that would tend to cause disease.—EDITOR.]

THE CATTLE PLAGUE.

BY DR. MASCH,

Veterinary Professor at the Agricultural College at Altenburg, Hungary.

Within the last year the scourge of the rinderpest has caused ravages among the cattle to an enormous extent, chiefly in the eastern crown-lands. Even now its fatal influence is still manifest; and although the last case in the inland may be a thing of the past, the danger for the future is nevertheless not lessened; far in the distant east there perpetually arise, from a mysterious source, life-threatening agencies, which, once developed, travelling in all directions, may also reach the byres and droves of cattle here.

If the rinderpest and the cholera are compared with each other, then they agree in the destructive influence which they exercise on those living organisms over which their power extends; they agree also in the fact that they defeat every medical enterprise which is directed against them as a curative means; but in other respects the two diseases differ. Whilst the horrible spectre of cholera, when it visits city and hamlet, stalks on paths undiscoverable, or at least undiscovered, the way in which the rinderpest spreads lies more open. A combustible substance will be set on fire by one, burning with the more certainty the more closely it comes in contact with the flame and the heat of the latter. Thus, among sound cattle of a byre or drove, every diseased one is to be looked upon as a burning, glowing, flaming body; and every other animal near it as a combustible body. This comparison is correct; and should, in its extensive application be a guide to every intelligent farmer in order to avail himself in time of danger of the right means of ensuring the safety of the cattle. The writer of this believes most firmly that cattle can be protected against the rinderpest more successfully than a house against fire.

With this conviction we appeal to the breeders, feeders, and dealers in cattle; and for the protection which we most confidently promise them, we demand an attentive ear for our advice, and, if it is necessary, a rigid carrying out of it. We must however, first of all, give some explanations of the capabilities of infection of the plague in question.

That the rinderpest is contagious may be expressed in this way: The material parts and particles of diseased cattle, whether they be solid, liquid, or gaseous—whether they be among themselves in organic combination or departing from the organism, or already departed—all are in a peculiar condition, departing from the normal one, just as the state of a ball when heated departs from the state in which it is when reduced to a lower temperature. The peculiarity of this state is equivalent with its power of infecting, and this results in the fact that material particles of diseased cattle when transferred to a sound one, and penetrating the barrier of a thin epidermis, change in a few days the whole of the latter, so that it is likewise capable of infecting. It acts as a ferment. It must be looked upon as an established fact that cattle in our countries never develop rinderpest otherwise than by receiving particles of matter from individuals of their species already fallen victims to the disease. It is, however, just as certain that cattle cannot be placed in a state of safety except by a protection which involves a complete shutting out from sound cattle

those minute particles of matter called contagious matter. He deceives himself, and makes a tremendous mistake, who, neglecting the only means by which he may protect his cattle, seeks the safety of his animals from infection by bleeding, lotions, injections, in secret and traditional popular remedies; and who, in false confidence in these things, does not minutely observe the care necessary for the prevention of infection; and who, perhaps, disregards the sanitary rules altogether, or carries them out but very imperfectly. This is the more unpardonable, because in such a case the imprudence of a single individual endangers the material well-being of a whole community. It shows, however, also the stubbornness and blindness of those people who, actually knowing that, in the midst of diseased places and districts, the cattle of those proprietors are not damaged who, for the prevention of disease, carry out an isolation which goes too far, but which is certainly effective; and who, seeing this occasionally, do not yet understand how to avail themselves of so beneficial an example for the protection of their own cattle. The writer of this essay has met with ridiculous views and habits in this department, especially among small proprietors (Bauern), over-wise empirics, and clergymen who carry on farming. The class last named weigh the more heavily in the scale of public injury—the more the example of the shepherd determines the conduct of the flock. People generally dread the small inconvenience of the moment, and remain indifferent towards the threatening disasters of the future: they are afraid of the application of a salutary remedy, and neglect the saving operation; and at last they accuse the State, the public administration, the sanitary organs, and demand compensation for the damage which they did not feel inclined to avert. We, however, stick to our proposition; and understand by prevention of rinderpest neither more nor less than separation of diseased from sound cattle. If it is asserted that for infection direct contact between healthy and diseased substance is necessary, then this is literally true. But by "contact" we should not only understand the meeting of a tangibly solid or liquid particle of the diseased substance on the one hand, and the living healthy organism on the other, but for infection the meeting even is sufficient of such diseased particles as, on account of their gaseous nature, remain imperceptible alike to the sense of taste and touch. Every living organism, and even a dead body, is perpetually surrounded by vapour, the material parts of which escape in all directions; which, however, remain permanent through additional elimination of particles from the tangible substance. A diseased animal lives likewise in its own atmosphere, and forms as it were the centre of it. This atmosphere, as regards its material part, is composed of particles which, endowed with the power of infection, escape from the diseased body, and are carried away, however short the distance and however brief the time may be. This contagious atmosphere must particularly be paid attention to, because it is invisible, and therefore often ignored altogether. Of equal importance and effect are also the breath, the gaseous evacuation of the intestines, as well as the effluvia which escape from the excrements of the

intestines, the urine, the milk, the blood, flesh, saliva, lachrymal fluid, skin, and other parts of the diseased organism, either during life or after death.

Whether there is more contagious force in the gaseous, the liquid, or the solid animal particles, is of no importance for the farmer to know; and it is more beneficial to him, as it corresponds more with reality, to consider them all equally dangerous.

Although it is not to be denied that the contagious force dwells in a more concentrated form and more permanently in solid and liquid matter than in gaseous nevertheless the latter penetrates more easily into the more delicate structures of the organism, since there lies exposed to it the convenient way in the large extent of the mucous membrane of the respiratory organs. Gaseous and liquid contagious matter can be longer preserved by mediums, viz., bodies of various kinds to which they attach themselves; and when removed from their place of origin they may still be capable of showing themselves effective. Porous substances, such as furs, woollen articles, and linen tissue, are, on account of their immense surface, capable of receiving and condensing gaseous contagious matter, and of carrying them to great distances. They are, on that account, very properly called "poison-catching materials." Contagious matter in a liquid shape does not retain its poisonous properties so very long as when it is attached to mediums which favour its becoming dry, but do not accelerate decomposition. Of this sort are especially dry substances of vegetable and animal origin.

As very dangerous mediums of conveying the rinderpest in cases where the disease appears in the neighbourhood, men must be so considered, and besides them half-free domestic animals such as dogs and cats. Men may be the more suspected of carrying the disease the more they have to do with cattle by occupation and trade, and not with cattle only, but also with the offal and useful parts of the animals. Cattle-dealers, butchers, &c., and also drovers, are dangerous; and so, too, are veterinary surgeons, and especially those who, without being qualified, engage in veterinary occupations. Dogs and cats, as well as even the fowls of large farms, come too often in contact with cattle and their offal, either in the society of men or otherwise, to be regarded with indifference.

There is one class of carriers of contagious matter less known and less mentioned, which we will notice here especially. These are the *flies*. These creatures, moveable, unsteady, and unnoticed as a means of spreading rinderpest, are possibly capable of multiplying cases of rinderpest greatly, by conveying contagious matter even to those cattle that appear to be completely removed beyond danger. If flies are even to healthy cattle most obtrusive parasites, they are such to a much greater extent to exhausted diseased cattle. They seek, with a special preference, food at the margin of those apertures of the body that are provided with but a very delicate skin, whilst others plunge their suckers into the skin to suck blood; both kinds, when driven from one animal, alight on others, dwelling more or less near, and spread the plague by means of their poison-carrying sucking apparatus to great distances. We are unable to refer the rapid and extensive spreading of the plague in summer and autumn to any other cause than the multitude and activity of the two-winged insects at those seasons. This means of infection has certainly some connection with the custom which prevails among some cattle breeders of smearing tar over the surrounding parts of the eyes, the margin of the nostrils, and the mouth, expecting from it protection against the disease. We do not hesitate for a moment to recommend at the fly season and at an approaching danger of the plague an application, occasionally, of such fatty substances as are mixed up with oil of turpentine, tar, or creosote, on the parts of the body mentioned above. It should however, not be done in order to supersede other means of safety, but merely to keep off these dangerous flies. The most effective, surest, and the most common carriers of the rinderpest are diseased cattle themselves. They act by means of their breath, their atmosphere of evaporation, the surface of their tangible body, as well as by means of everything solid and liquid which arises from their organism, and with the more certainty the more closely and longer sound animals are in this way brought into contact. This becomes especially conspicuous in byres where among animals standing in rows the plague commences with one; the one that stands next to it is generally the next to get the disease and die.

It is pretty generally known that an infected animal does

not show the symptoms of the disease on the very first day it was infected; this requires a period of incubation of at least five days. After this period the system shows first the progress of a power that has crept through the whole organized structure of the body, and threatens its existence. It reveals at once by external symptoms, departing from the healthy processes of life, the existence of internal dangers. From this period the symptoms of disease increase in the same degree as the contagious force spreads in the system, and extends over as many days as are required for incubation. The disturbed system very seldom succeeds in disinfesting itself by the mustering of its own vital energies, whilst at the same time the symptoms of the disease subside; in most cases the efforts of the living body, which are directed against its dissolution, are not sufficient to avert the fatal results of infection. A small percentage of diseased cattle recover; yet this recovery is a complete one when compared with another calamity among cattle—pleuro-pneumonia. If the cattle of Eastern Europe are compared with those of Western Europe as regards the rate of mortality in consequence of the rinderpest, it will show that the former generally possess but little power of resistance against the fatal issue, and yet the power of resistance is decidedly greater among them than among the latter. Out of one hundred diseased cattle scarcely five escape death. Organisms, which have received the contagious matter, acquire the capacity of infecting not only at the time when the disease appears, but from this period till the animal dies it is perpetually increasing. However, for twelve hours after the appearance of the first symptoms the capacity for developing contagious matter is but very small. Sound cattle are during this time, according to the opinion of the writer and the experience of others, by no means endangered. This circumstance is of the utmost importance for the prevention of the spreading of the rinderpest; and whatever may be said to the breeders of cattle with reference to battling with this calamity, it is true that the speediest separation of diseased from sound cattle is still the most practical and most successful procedure. If in a row of houses built of wood fire breaks out in one of them, then the other buildings can be saved if the burning one is immediately removed to a place the neighbourhood of which is fire-safe.

If in every place where rinderpest is approaching, every animal that shows itself diseased is without delay removed to a safe place and made safe for others, then something of the most effective kind would have been done for the limitation of its spreading; the rinderpest would be extinguished from sheer want of food, after the very first sacrifice, and the poleaxe, although a very rude but at the same time an indispensable means, would get out of use in its application to diseased and suspected animals. One must have respect for the utility of all sanitary rules for the suppression of rinderpest; but carrying out these generally succeeds but very slowly, even under the most favourable circumstances, and encounters on that very account an opposition which has become already great and powerful, and is only with difficulty conquered even by costly means. In consequence of the watchful care on the part of the cattle proprietors, by means of which they discover quickly which are diseased cattle, and at once remove the diseased from the sound, the battling against the cattle plague should be considerably facilitated on the part of the public sanitary authorities, and the majority of innocent victims.

From what has been said, the assumption may be justified that the protection effected by the separation of diseased from sound cattle surpasses in efficiency every other practical procedure devised for the suppression of the rinderpest.

This protection would, however, be illusory, and its proclamation premature, if the separation, so much recommended, is not carried out at the right time.

The chief question is—What period is the right one for separation? Whereupon we answer conclusively, The sooner the better. The sooner the disease is discovered the better; the more immediate the subsequent separation the more certainly is the danger of the spread of rinderpest obviated. The disease of the rinderpest announces itself at the beginning by no other symptoms than those which appear also in other febrile diseases involving the whole organism in their very origin. These are just phenomena common to all febrile cattle diseases—as, for instance, diminished appetite, irregular mastication, low spirits, want of vitality, muscular weakness, relaxed condition of the whole body, the head, the ears, and the tail.

The practised eye of the breeder recognizes easily these external signs by the inspection of his cattle, and diagnoses from it the first indistinct outlines of an ensuing diseased spectacle. In ordinary times he avails himself only of but ordinary means, and abandons himself perhaps to the hope that it is with such signs as with ordinary thunderclouds, which tower at noon in a threatening manner, and evaporate in the evening without a trace, and without culminating in a thunderstorm. But at a time when the cattle plague is threatening, then the cattle-breeder should get every suspected animal out of the reach of the rest, and avail himself of all further precautions, after he has carried out the first and most important—that of separation. One should in such cases not fear that the approaching evil is the rinderpest, but one should fear that it might be the rinderpest; one should not abstain from trading from want of proofs, but one should trade on mere suspicion; he who waits for certainty is too late. One should not object to the writer, that in this way cattle-breeders are kept in perpetual apprehension, and induced to make many provisions which are, after all, superfluous. Reproaches of this kind can only emanate from those who have not themselves perceived the bitter after-taste of the rinderpest. He who has been once injured by it will, on a new occasion, inevitably carry out the separation of every animal only suspected; and if in ten cases the suspicion has proved groundless, in the eleventh case, nevertheless, the separation should be hurried on.

In no other place are the sanitary rules in regard to the rinderpest carried out with so much circumspection and success as was done in the years 1862 and 1863 in the district of Altenburg, in Hungary, which is so rich in cattle-farms. Whilst the disease lasted, every head of cattle which manifested indisposition was, after the very first symptoms, immediately removed from the byres to a place of inspection. In this manner many animals have been conveyed to the places of inspection, and removed afterwards to their former abode when their soundness had been sufficiently established. Caution has, nevertheless, not been diminished. On the 24th November, 1862, an ox in a large byre evinced signs of indisposition, very indistinct and scarcely perceptible. This ox, however, was removed half-an-hour afterwards in consequence of the existing strict rules; and since his indisposition was aggravated, it was made known to the authorities, in accordance to sanitary laws. A commission of practical men discovered in this ox, five days after his disease, the symptoms of the rinderpest so distinctly developed that even without the addition of the proofs derived from a section, the former alone would have sufficiently established the existence of a case of rinderpest. The other oxen remained sound.

This case, and other illustrations, will, it is to be hoped, place the significance and usefulness of separation in a right light, and justify the author if he speaks on it with a determination to convince the cattle-breeders of his country.—*Translated by Herr H. Kunde, Edinburgh, for "N. B. Agriculturist."*

A CURE FOR THE CATTLE PEST.

The following table of cattle cured, with the names of the cowkeepers and farmers to whom they belonged, are furnished by Dr. Browne, a retired army-surgeon, who has had great experience in fevers and cholera in the hot climate of India. Since the outbreak of this cattle pest he has given almost his whole attention to the subject, although he has not stopped to inquire whence the disease originated, but has the rather taken the animals as they were found, some dead, some dying, and others showing symptoms of the first stage of the disease. Dr. Browne's opinion, however, from the first, has been that the disease was indigenous, and only developed by some extraordinary conditions under which the animals were placed as regards the weather, their food, and the confinement in which they had lived. This quite agrees with the views of Clayter, the observant and reflective veterinarian who wrote of the "plague" of the last century. This latter authority says it is always present among us, and was brought to the state of a "plague" by extraordinary conditions similar to the above.

Of the living animals enumerated below, we may say that we had the satisfaction yesterday of seeing them, not only in a recovered state of health, but in restored condition, and giving for the most part a full supply of milk. It will perhaps be wondered how it was that Dr. Browne could, under the orders issued by the Privy Council, get animals to experiment upon; but the simple answer to this is, Miss Bardett Coutts, after losing her herd, applied to the Privy Council for leave to have the trial of curing some made, the expense of which experiment she would bear. Thus the following evidence of one step having been taken in the right direction is due to the sagacity and liberality of a lady whose name has long been connected with good works. Her expressed motive was to avert in some measure the impending ruin of small cow-keepers, whose livelihood might depend altogether on the health of a few cows. Miss Coutts placed this concession on the part of the Privy Council in the hands of her physician, Dr. Forshall, who has witnessed the effect of Dr. Browne's treatment in the cases of Mr. Cotton's and Mr. Bateman's cows.

Many of the cows, as it is well known, of these herds died off in the first instance without the chance of the recovery of one of them. Now Dr. Browne says he has no doubt about curing at least 90 per cent., and if the first symptoms were at once detected by hourly inspection, a greater per-centage than that could be saved. The great difficulty in which Dr. Browne is now placed is that of being unable to get animals to

cure. If this be true, and our observations go to confirm it, what a blot this pole-axing and stamping-out remedy will be on all who have had in it a guiding and governing hand!

Mr. Alderman Sidney had a cow which last week threatened to fall into a state of collapse. Dr. Browne pointed out the symptoms to the Alderman and administered his remedy. The cow yesterday was sleek and apparently perfectly restored. A young bull of Mr. Bateman's had been under other treatment, and was about to die, when Dr. Browne gave it a powerful dose, and it is now alive and sleek, although there are yet signs of the great shock to which his system has been subjected. Mr. Cotton has a cow which had not the remedy applied for three days after being attacked. Yesterday, at the end of the sixth day, she was alive, and although apparently very bad, she had not got beyond the second stage, and Dr. Browne was confident of her ultimate recovery, as she had lived so long under such disadvantages. Another had fallen off her feed; but she was taken in time, and no symptoms of running eyes and nose or staring coat had yet come on, while the sensitiveness along the spinal ridge had departed. There are some other observations that we have to consider and relate, but these we will defer till we have had a second opportunity of witnessing the result of the treatment in question. The following table of facts and notes on symptoms Dr. Browne wrote out at our request. Many of those cured cows we saw, one lot of 17 all looking well and chewing their cud. Mr. Cotton had about the same number remaining. According to the theory of "eminent" veterinary advisers, the whole of these fine, and many of them beautiful cows, ought now to have been mingled with quick lime six feet deep in the earth!! Dr. Browne, whose address is Green Laues, Hornsey, N., says:—

I observe that the cattle plague exhibits in its course three stages or phases:

1st stage. It manifests itself by a watery glassy appearance of the sclerotic coat of the eye, with fulness of the superficial vessels; the vertebral column is tender on pressure, especially about the dorsal region; the coat is dull, and on the summit of the spinal ridge the capillae are elevated; pulse slower than natural, and irregular.

2nd stage. Pulse possesses a thrilling sensation, with irregular action; the capillae are rough, dry and staring; the nostrils and mouth are covered with exudation; there is a drooping of the head; the ears are below their natural temperature; there is evidently much pain in the head and back;

the urine is scarce, and milk almost or totally deficient; a pungent and peculiarly nauseating odour escapes from the animal, and there is some amount of purging; the mouth may have a few slight patches of ulceration; breathing apparently oppressed; on applying the ear to the chest crepitation may be more or less present; the animal occasionally moans.

3rd stage. Constant moaning; pulse small, irregular, and intermittent; frequent purging of most offensive dejecta; the nostrils exude purulent secretæ, and from the mouth frothy mucus keeps dropping; the animal is below the ordinary temperature; there are frequent tremors of limb and muscle; there is rapid and excessive wasting; the evacuation has a colour of muddy water, and aqueous in character; there is an inflamed look of the mucous lining of the terminal passages, with blood sometimes passing; great weakness; breathing hard, difficult, short, and laboured; pulse gets more feeble, moaning more persistent, and effluvia from body more pungent. The senses remain clear to the last, when the animal, after enduring many hours' suffering, dies, after a few efforts to rise.

Such are the distinctive physical external characteristics of this disease. And as I find that the sensoria are intact, that there is a total absence of sordes or furring about the mouth or teeth, that shiverings are absent, that the skin is from the first stage below par equally with the pulse, I cannot, therefore, attribute the malady to what is called typhus.

For the foregoing reasons I can only conclude that it is essentially what is conventionally termed "pest," being closely allied to the severer forms of cholera among the human species, for when the disease is apparent in the animal a period of collapse has set in. That the disease is capable of easy arrestation in the first stage is now most satisfactorily established—so much so, that a fatal result will be the exception.

CASES OF RINDERPEST TREATED BY DR. J. COLLIS BROWNE, FROM JULY TO OCTOBER, 1865.

Name.	Residence.	Treated.		Total.	Died.	Cured, remaining or subsequently sold.	Actually remaining at this date.
		At Farm.	In Dairy.				
Mr. Mills	Roman Road, Islington	7	23	30	9	21	16
Mr. Jordan	Newington	18	35	53	13	40	20
Mr. Palmer	Horusey	5	—	5	—	5	—
Mrs. Nichols ..	Liverpool Rd., Islington	—	7	7	2	4	4
Mr. Bateman ..	Finchley	5	—	5	—	5	5*
Aldn. Sidney .	Southgate.....	1	—	1	—	1	1
		36	65	101	24	76	46

* One died from Exposure.

J. COLLIS BROWNE.

Whatever may be the ultimate result of this treatment, surely Dr. Browne ought to be called to give evidence of the result of his practice before the Commission just appointed. Now we have the malady in our midst, its cure is of the first importance, and its origin a mere after-matter for consideration.

W. W. G.

[It appears that Dr. Browne did not furnish our correspondent with his recipe, but of course this may be had in the way of business.—Ed.]

COMSTOCK'S SPADER ON THE FARM OF MR. SULLIVANT.

Army correspondents delighted in saying that the head quarters of a certain well-known general were in the saddle. The head quarters of Comstock's rotary spaders are well established in strong position in the field at "Broadlands." Though a simultaneous movement is being made along the whole line, and blows are being struck at some twenty different points, there is the great central position where the greatest results have been expected, because of superior force and the great amount to be accomplished.

To give a better idea of this whole matter, it may be well to state that the farm of Mr. Sullivant embraces a tract of about twenty thousand acres, consisting, for the most part, of high rolling prairie land, entirely within what has very appropriately been termed the great "corn zone" of Illinois. It is without doubt the largest tract of land legitimately farmed in the United States, or perhaps in the world, by one individual; we say legitimate farming, because here everything is carried from one central point, where all the hands are fed and lodged, and from whence they depart to their daily toil. Instead of the system of tenants working their allotted sections, as is generally the case with large landholders, one master-mind controls and directs all here, subordinates counselling and carrying out plans for the season, the week, and the day. When it is considered that "help" here is counted by the score, acres of corn, the great crop of the farm, by the thousand, oats and other small grain by the hundred acres, pasture and meadow lands reckoned by the section, and the hay crop by the hundred tons, that the fencing counts well up towards a hundred miles, and all else in proportion, it will be seen at a glance that everything must be conducted with system and regularity: there must be few loose ends. Such is the case here. Such a system of accounts has been adopted as shows the proprietor at a glance at the close of the year not only what it has cost to raise a certain crop, but what each part of the labour upon a certain crop has cost, so that to that portion which relatively is the most expensive, attention may be directed to its cheapening. For instance, if ploughing is found to cost more than any other part of corn growing, it is of course at once decided to inquire into and encourage all efforts at improvement in ploughs or their equivalent. The same is the case in all

the departments of labour upon the farm. The latest and the best farm machinery is always in demand here, and it is in no wise counted a loss to cast aside even expensive machinery when an improved substitute is at hand; and while a visitor may be astonished at the immense collection of used up, discarded, superseded implements, a little reflection shows him that they have accomplished a useful purpose, have caused but a comparatively trifling loss, as they have simply given place to better.

Now it is a fact that in the culture of our corn and other common crops the work of the plough is fundamental. Its workings are slow and tedious, requiring hard labour from both man and beast. The fitting of land for the growth of the common cereals, or for the establishment of meadows and pastures is often as expensive as is the whole after-culture, and in some cases even more so. Knowing all this as plainly as actual figures could demonstrate it, Mr. Sullivant watched with eager interest the efforts of Mr. Fawkes and others to perfect the steam plough so as to adapt it to the culture of his broad acres, and on this account he has become so warm and so early a patron of the rotary spader invented and introduced by the Hon. C. Comstock, of Milwaukee, Wisconsin. The first of these implements was introduced upon the place last fall—too late for anything more than a partial test, sufficient being done, however, to strongly recommend it to Mr. Sullivant and his most capable superintendent, Mr. Eaton, and to determine them in an early and further test of its merits when spring should open.

For the benefit of those who may have seen no very definite account of the construction of the spader we will say that the main frame of the machine consists of a wrought iron shaft with two cast iron heads keyed fast to it, one at each end, the shaft extending outward to receive the hounds attached to the tongue. To these heads are attached, by means of pins or handles, a series of large spading forks made of an iron head, each tooth being simply keyed to it. The tines or teeth are made of the best steel, eight or nine inches long, numbering from five to nine, according to the work to be done. On the end of each fork-head are roller cans, which pass between the periphery of the iron heads attached to the main shaft and an

outside guide attached to the same, and moveable so as to control the direction of the tines in entering the ground. The tines are slightly curved, like a fork tine, widened and sharpened wedge-like at the end, and the cams and track are so arranged that as the whole advances the tines enter the ground perpendicularly to the advance of the machine, causing no friction front or back, excepting that of the teeth entering the ground. When the fork has reached the centre of the machine at the bottom it begins to move backwards horizontally a few inches, thus moving the whole body of earth that has been loosened. It then rises rapidly by a quickened action of the cam, causing a vibrating motion of the fork, thus pulverizing the whole earth removed, and at the same time preventing, by loosening, any accumulation that may be taken up by the fork. When it is desired to move from field to field the outer cam guide is thrown forward by means of a lever at the driver's hand, when the tines of the forks, instead of entering the ground, become folded close to the heads, and the whole machine passes over the ground with as much facility as a roller. The operator sits upon the machine on a raised seat, protected from dirt by an iron shield passing between him and the forks. As now manufactured the whole weighs about 900 pounds.

That these machines are only fit to show upon quarter-acre patches at fair-grounds, and to furnish food for calculation as to what may be accomplished *supposing* them to prepare so much ground per day, or week, or season, it is useless for sceptics to urge, for those now in use on this farm have already fitted for planting at least two hundred acres. On arriving at the field we found two of the machines were being operated with four rather light horses each; one team driven by a man, who from choice walked, and the other by a boy riding and managing his team with ease. These machines were spading three feet in width and eight inches in depth, leaving the soil thoroughly pulverized the entire depth, and in complete order for the planter, which was in use on the land prepared the previous day.

Though the horses were such as we should consider unfit for any kind of heavy farm work, we do not think they showed heavier labour than they would have done if attached by single teams to ploughs working six inches in depth. We need not tell the farmers of the west that the ground was too wet to work easily, but what we here saw proves to us that the spader will operate as well or even better comparatively than the plough under similar circumstances. The horses are worked four abreast, as it is thought the draught is thus more equally distributed among them.

The other two machines, to meet the broad views of Mr. S., we found ganged together, thus cultivating *six feet* in width, and to the same depth as the first two. These were drawn by six yokes of oxen, below medium size, and driven by one man.

These are adapted for the use of oxen by simply lessening the number of forks and reducing the diameter of the cylinder, giving a more rapid motion, and at the same time reducing the weight. These ox machines do their work to the satisfaction of all, and are the especial favourites of the hands, the Irish driver characterizing them in his rather laconic way, as "*but-ty* machines."

Of the amount of work capable of being performed by the spader our readers can, from the data given, make their own estimates; but it may not be out of place here to give a few figures as to the comparative cost of growing an acre of corn, made in the office of Mr. Sullivan. We will state that it is designed to attach self-dropping planters to the spaders, and thus accomplish the whole work with the same team. The price of labour of a man is reckoned at 1 dollar per day, a boy at 50 cents, horse 50 cents, and oxen 25 cents each. We thus have per day—

	dol. c.
One man, 2 horses, will plough 2 acres, cost per acre	1 0
" " 4 oxen, will harrow 20 acres, cost per acre	0 15
" " a boy, and 2 horses, will plant 10 acres, ...	0 25
" " 2 horses, will cultivate 8 acres twice ...	0 50
Total cost per acre	1 90

One man with spaders and eight horses, travelling the same distance (sixteen-and-a-half miles, spaders 3 feet 8 inches in length), will prepare and plant fourteen-and-a-half acres, which will cost, one man 1 dollar, eight horses 4 dollars—5 dollars, divided by fourteen-and-a-half acres, and we have

34½ cents per acre. Add cultivating, 50 cents per acre as before, and we have the cost of laying by a crop of corn 84½ cents per acre, or a saving of 1 dollar 5½ cents per acre over the common way.

Among the advantages of the spader over the common method of culture we may mention—

1st. The greater rapidity with which the soil is broken up, one spader being equal to three ordinary ploughs.

2nd. The dispensing with at least two hands necessary to accomplish the same work with the plough.

3rd. The dispensing with one team.

4th. Dispensing with the use of the harrow—requiring both team and men.

5th. Though not least—A culture of nearly double the depth of ordinary ploughing, the advantages of which in giving a crop with more certainty and of a largely increased amount, we do not deem it necessary to discuss, as it must be obvious to all.

It surely gives a saving of more than one-half the cost of growing a corn crop, and we certainly look for an increase of yield equal to twenty-five per cent. At least theory, and the experience of last year, on the farm of Mr. Barnes, of La Salle county, seem to indicate this.

We have no hesitation in giving it as our opinion that a new era in western agriculture dates from the invention of the rotary spader; and we yet expect to see steam the motive power in its use.

We should be pleased to give some of the many speculations upon the future of the spader, in the various uses to which it seems adapted, such as the spading in of small grains, fall and spring, the loosening up of "bound" meadows or pastures, and its enormous addition to the productiveness of our land, that were indulged in as several of us were gathered around the comfortable office fire at Broadlands. But all such will suggest themselves to others as they become acquainted with the machine, and many of them will soon be put to the test, when they will come before the public as actual facts, instead of somewhat vague theories. Be assured of one thing, however: Comstock's rotary spader is a practical implement, and will figure largely in western agriculture hereafter.—*The Prairie Farmer*.

[This implement may now be seen in work on Mr. Hamilton's farm at Acton, near London.—EDITOR.]

HOW TO CHOOSE A COW.—On this subject, the *Working Farmer* says: "There is always some risk in buying a cow, of whose previous character and history we know nothing, for there are no infallible signs of excellence. A rough, coarse, ill-shaped cow is often a noble milker. Yet there are a few points, generally agreed upon by experienced farmers, which it is well to consider, before purchasing. A small-boned head and light horns are better than large. Long legs make too wide a gap betwixt udder and milk pail, and long-legged cows are seldom quiet feeders, but wander about too much. A slender rather than a thick neck, a straight back, wide ribs and broad brisket, are to be sought for. The body of the cow should be large in proportion to head, neck, and legs, though not excessively large; and the hind-quarters if largely out of proportion indicate good milking qualities. Medium-sized cows, all things considered, prove the best milkers for the amount of food they consume. The colour of the hair has probably nothing to do with the milking qualities, and good looks should be regarded but little in purchasing dairy animals. As to the colour of the skin, a bright yellow, approaching that of gold coins, creamy colour within the ears—this and good rich milk are very apt to go together; and, withal, a soft flexible hide, loose over the ribs and rump, is also to be sought. The udder should be large, soft, and full of veins, which ramify over it, with full-sized milk veins stretching forward along the belly, and the teats be large and not crowded together. Test the cow's disposition and inquire about it. Irritable and nervous cows are unpleasant to handle, and almost always scanty milkers. Something can be ascertained from the looks and motions. Large, mild eyes, easy quiet motions when driven, and gentleness when handled, indicate good nature. What butchers term 'good handling' is an important quality in a milch cow, for it indicates not only good milking properties, but easy fattening, when services in the dairy are over."

ON CROSSING SHEEP.

Amongst the many changes and improvements which have been effected in Scottish farming during the last twenty-five or thirty years, there are few of greater general importance, in certain points of view, than the practice of crossing pure but inferior breeds of cattle and sheep with others of a superior description. One result has been that the good qualities of what we call the inferior breeds have been retained, whilst others are at the same time superadded; all being so blended together as to form a combination of properties not to be found in either of the pure breeds from which the crosses have sprung. With this there has been a most material increase in the supply of human food, arising chiefly from the greater tendency to early maturity in the crosses than in many of those breeds from which their dams have been taken. It is but lately, comparatively speaking, that the idea of slaughtering shearing sheep, in a perfectly finished state for the use of the consumers, would have been scouted as impracticable, were it broached in a company of breeders and graziers; yet sheep of that age, and even younger, form the principal part of the supplies in most fat markets, affording the public more than double the quantity of meat which could be produced when we had to wait until the animals were three, four, and even five years old before they reached the butcher's stall. Epicures, indeed, may lament the increasing difficulty of procuring a joint of their favourite five-year-old hill-fed black-faced wether mutton; but the general public are better served, and that is the chief thing to be considered.

From the improvement in pastures caused by surface and other varieties of draining, and also owing to the freer use of turnips in the case of hill farms than was the rule a quarter of a century ago, the breeding of crosses is now carried on in districts where at one time a very different system prevailed. We know hill farms where a wether was never sold until at least three years of age, and yet these farms are now sending out crosses at half that age, which bring higher prices than the aged sheep did at any time in our recollection. Those breeders, therefore, who follow this system have quicker returns than their fathers or predecessors could realize; the markets are more fully supplied, so as to meet the increased requirements of an increasing number of customers; and landed-proprietors obtain higher rents, although, we dare say, some will consider the latter a very doubtful advantage.

If the system of crossing has been satisfactory in the case of sheep, it has certainly been not less advantageous in that of cattle. The splendid Scotch crosses which form the principal article of demand for London "West-end" consumption appear to exhaust the powers of reporters, especially when describing the supplies sent forward to the Christmas markets, in consequence of their extreme excellence in point of symmetry, quality, and finish. We all admire the noble West Highland bullock, and the somewhat less imposing, though not less useful, Galloway; but if we adhered to these, and possessed no other breeds, we would be very far short of meeting all the demands which the consumers of high-class meat at the present day make upon graziers. We must, no doubt, keep these and some other breeds pure, for the purpose of procuring pure-bred females for crossing purposes; and, for this very reason, too much attention cannot be paid by those who possess the pure breeds, and whose pastures suit them, to their improvement in every respect; for by attending diligently to this point, they not only benefit themselves, but their customers and the public generally.

The Leicester ram is that which has been chiefly used in Scotland for crossing ewes of the black-faced and Cheviot breeds, and the result of such crossing is the production of a most useful class of sheep, both in respect to wool and mutton. Whilst we acknowledge, therefore, the value of the Leicester cross, we are desirous of bringing under the notice of our readers the merits of another breed which more than rivals the Leicester for the purpose to which our remarks refer. We allude to the Shropshire, a breed which has risen to vast importance in England, owing to the great care which has been bestowed upon its improvement, so that it now ranks amongst

the very first in the list of English breeds of sheep, is spreading rapidly into different parts of England hitherto occupied by other varieties, and is coming into great favour in Ireland. It is, however, little known as yet in Scotland, but we believe that it only requires to get a fair trial by Scotch graziers to render it quite as much a favourite with them as it is in other parts of the kingdom.

There is a great deal, in fact, in the Shropshire breed to recommend it to Scotch graziers. Sprung originally from a small but very hardy mountain race, which have existed from time immemorial in the moorland districts of Salop and Staffordshire, it possesses great vigour of constitution; it attains maturity at an early age; the mutton is well mixed, greatly resembling that of the Scotch black-faced, a similarity which is still further carried out in the rich juiciness of the flesh; the ewes are first-rate nurses; and the wool is close set, heavy, and valuable to the manufacturer. It is alleged that the Southdown has been employed in crossing the Shropshire native breed. This was done to a certain extent, perhaps, half a century ago, and we have no doubt with a degree of success at the time; but it is a certain fact that wherever modern breeders of Shropshires have been foolish enough to introduce the Southdown, the result has been such a complete failure, in every respect, that they have had to renew their flocks altogether. They have been driven out of the market for years, in consequence of their sheep, owing to this Southdown cross, having lost weight, caste, and character; and no one of experience would think for a moment of resorting to such a cross with the view of improving a well-bred Shropshire flock.

The Shropshire breed is truthfully described by Tanner, in his Prize Report of the Agriculture of Shropshire, as combining "the symmetry and quality of the Southdown with the weight of the Cotswold; it possesses the fattening tendency of the Leicester without its delicate constitution; but this disposition to fat is combined with such a development of the muscles of the body, that beautifully marbled meat is produced, which can go on any table in the kingdom, and especially among the higher classes of society, where the excessive fatness of the Leicester mutton is objectionable. The price of this mutton is as high as any in the market; and when this is said of sheep ranging from 35 lb. to 40 lb. per quarter, and carrying fleeces of the best quality from 6 lb. to 12 lb. in weight, it must be admitted that such a breed is indeed of very high value."

True-bred Shropshires are easily distinguished from the Southdown breed by their greater size; their wool is also longer, but still as close as that of the Southdown. Their faces are usually of a dark-grey colour, inclining to black, that of the legs being still more decidedly dark. They have good backs, with long quarters, and full leg of mutton, being particularly good where most Leicesters are defective. They have a good expression of countenance, the face and ears being on a larger scale than in the Southdown, without evincing any approach to coarseness.

But with respect to the value of Shropshires for crossing inferior breeds, for the production of fat lambs, or of sheep to be fattened off at an early age on turnips, we have it in our power to say, after several years' close observation, that we do not know of any breed—the Leicesters not excepted—which excels it. There is one point in which strangers will often be deceived, when judging the lambs by the eye, whether the lambs are pure-bred or crosses, namely, in the weight, for they often weigh much heavier than their appearance would warrant at first sight—a fact, however, which is very soon found out, once a person goes among them and tries them. The same feature accompanies a maturer age, and we have often seen a look of amazement on the faces of those who have tried to turn a fat Shropshire wether for the first time, or a cross of that breed.

Amongst the many illustrations of successful crossing with the Shropshire to which we might refer, there is one of considerable interest to Scotch breeders, seeing that it is a trial, extending over several years, of crossing black-faced ewes with

Shropshire rams. This cross has been carried on, with the most satisfactory results, by J. W. L. Naper, Esq., of Loughcrew, in the county of Meath, Ireland, and to that gentleman, and his clever farm-manager, Mr. Alexander Stewart (a Perthshire man, by the way) is due, in fact, the credit of having first originated the cross, and then tested it by such extensive and repeated trials that its merits are now settled beyond a doubt.

Mr. Naper had been in the habit of crossing with Leicester rams; but as that cross did not come up to his expectations in some points, he tried a cross of the Southdown on his black-faced ewes. The result was that the mutton of the Southdown cross was improved in point of quality compared with that produced by the cross of the Leicester, but there was a loss of weight; and about eight years ago, the Shropshire was resorted to, in order to try whether the weight could not be increased, and the quality at the same time retained. In both points the cross has been most successful, giving early maturity, weight, and quality, with a vastly improved fleece.

We find that the black-faced ewes have cost Mr. Naper from 10s. 8d. to 16s., the latter being the price paid last year, and with moderate keep—turnips and a little hay from January until March or April—his cross hogs weigh 20lb. to 22 lb. per quarter, and at twenty-four months up to 20 lb. and 30 lb., the average at the latter age being 25 lb. per quarter. The crosses are uncommonly healthy, and Mr. Stewart believes that they are as hardy as their black-faced dams; but, as he very sensibly remarks when questioned on this point, that, although such is his belief, yet that in the comparatively mild climate of Loughcrew there has been no opportunity of testing this point. At the same time we may state that part of the lands of Loughcrew, forming a portion of the summer pastures of these crosses, are from 600 to 900 feet above the level of the sea.

The cross fleeces weigh from 6lb. to 8lb., whilst that of their dams range from 3 lb. to 4 lb. each. The price obtained in Dublin, in 1869, for the cross wool was 26s. 6d. per Irish stone of 16 lb.; and in November last, when prices were lower, 24s. 6d., when the highest prices going for any description of hogg wool did not exceed 25s. or 25s. 6d. per 16 lb.; black-faced wool brought 14s. 6d. to 15s. 6d. per 16lb.; so that the comparative value of the fleece of the Shropshire cross, not only as regards the wool of the pure black-faced, but also of other crosses, may be easily calculated.

There is not a doubt but that the introduction of Shropshire rams for crossing in Scotland would be attended with the very best results, for we find it quite as satisfactory in the case of Cheviots as in that of black-faced ewes. The very fact that the mutton produced by this cross is of splendid quality ought alone to be sufficient to recommend it to Scotch breeders, so that their cross-bred fat sheep might in all respects equal their cross-bred fat cattle. In the hope, therefore, that the cross we have been alluding to will be tried next season, we shall further state that the best time and place to obtain Shropshire rams is at the several annual auctions which are held by breeders in Shropshire and Staffordshire during the months of July and August, and also at the Shrewsbury August fair; and we may further say—because we speak from experience—that strangers wishing to procure good rams will be quite safe if they put themselves into the hands of Mr. W. G. Preece, the auctioneer in Shrewsbury, who is a perfect judge of Shropshires, and, in fact, the Stafford or Wetherall of the breed.

There is yet one point to which we intended to allude if our space permitted, but at present we shall merely broach it, without entering into particulars. It is this—considering the mountain origin of the Shropshire breed of sheep; considering the close affinity they bear to the Scotch black-faced in point of quality of mutton; considering, further, the hardness which is a prominent feature in them, might not a touch of Shropshire blood be judiciously introduced into the black-faced breed, with a view to its permanent improvement, especially in reference to the fleece? This, however, is chiefly a matter for after-consideration, and we merely throw out the hint in the meantime, being at present more anxious, on the whole, to see Shropshire rams used for regular crossing, in the same manner as Leicesters have been employed for so many years.—*Scottish Farmer.*

[There is so far such a want of uniformity of character in the Shropshire sheep that must tend much against his value for crossing.—EDITOR.]

H E A R T ' S - E A S E !

BY MARK!

[From the *Sporting Review.*]

I left the gay city, for my love had left me,
And went to the country, down into the South;
And wandering about—I was thinking of thee!
My loved one! with my heart up into my mouth.

I walk'd in the fields among the wheat stubble
Feeling so lonely! in a desolate place,
Low bending to earth in the midst of my trouble,
A sweet little doweret look'd into my face—

And singing and crying in bitter distress,
Oh! there is the treasure I wish to possess.
"Heart's-ease," ease my heart—oh! it never can be,
The love of my life has departed from me.

A stir, and a whirl, and a rush of surprise,
Flush'd up from the ground, just under my eyes;
A covey had risen—brown beauties were they,
I shot right and left as they flutter'd away.

Bang—chang—rang in time, the musical sound,
The old cock and hen lay flat on the ground;
And a brace of young birds as plump as the old,
Not far from the old 'uns, over were bow'd!

In loading my gun, 'neath its butt, I espied
A sweet little heart's-ease, about which I sigh'd—
I press'd it hard down into the grass,
And cried, Ease my heart, alas! ah! alas!

The love that has fled is better away,
So let me enjoy this beautiful day,
The dogs were at "down charge," the birds were at rest,
I pick'd up two brace, and the young were the best.

"Hold up!" I cried out, and the two went away,
Off-bounding like elegant creatures at play,
Then dividing, made separate casts of their own
Over the ridges which had closely been mown.

With stern like a racehorse, Czarina the fair
Went off 'gainst the wind, her head "high in air,"
Made the first point, in just running over
A fellow, to a piece of young clover.

And far in the distance, watchful Therese
Bock'd like a beauty, and stood at her ease,
With neck stretching forward and full earnest eyes,
And tail like a fine-pointed arrow that flies.

There they stand, their separate duties performing;
I admire! and feel the beautiful morning.
As forward I walk to the beautiful clover,
Bang! bang! right and left a young bird is over.

And down falls each dog as she hears the report
Awaiting commands, and enjoying the sport,
When, lo! looking down, a heart's-ease is seen,
Beautiful floweret, with long leaves of green.

In thy lone existence I plainly can see
That, although I am lonely, yet I am free;
Then heart be at ease, for depend it is best
To hide the fond passion of love in the breast.

Go walk in the fields on the 1st of September,
The crosses of life you will scarcely remember;
Your dogs, and your gun, and the beautiful flowers,
Are better than love, with its feverish hours.

ARTIFICIAL COMB FOR BEES.—A Swiss invention has been introduced into this country, to aid bees in the formation of their comb. Narrow sheets of wax are imprinted by machinery so as exactly to represent the dividing wall of comb between the cells. These stripes are attached to the top of the empty hive, before the new swarms put in, thus enabling the bees to go immediately to work, and also in guiding them in making the sheets of comb in the proper direction.

MIDLAND FARMERS' CLUB.

THE GAME QUESTION.

A general meeting of the members of the Midland Farmers' Club was held on Thursday, Oct. 4, at the "Acorn" Hotel, Temple-street, the subject for discussion being "the game question," Mr. A. Robotham, of Drayton Bassett, reading a paper on the subject. There was a large attendance, Mr. G. A. May, in the absence of the President, occupying the chair.

After dinner the Secretary read a letter from Mr. Chawner, who said: "I still retain the same opinion on the subject of game, which I have previously expressed to the club, viz., that the question of game must be met by the question of rent. If a tenant took a farm free from game, or one where he had the sole control of the game, he would pay a farm rent; but where there was game, that was a farm partially stocked by his landlord; and the tenant, when he had calculated the consumption of his stock, and other damage sustained by him in the preservation and destruction of game, would offer a game rent. Whenever this distinction of rent was established, the game question would be settled. Valuations for damage satisfied neither party (Hear, hear), but left rankling bad feelings where only mutual confidence should exist."

The CHAIRMAN then said they were met there to discuss a very important subject—important not only to farmers but to landowners and the public generally, and he hoped it would be discussed in a fair, liberal, and enlightened spirit. He begged to call upon Mr. Robotham for his paper.

MR. ROBOTHAM then read the following paper: Gentlemen, I would not have consented to come forward and read the paper I am about to read on this very important subject, the Game Laws, were I not quite sure that there are gentlemen present who are willing to take part in the discussion which I hope will follow what I am about to state, that will bring to bear upon it such an amount of intelligence and knowledge of the subject as will make up for my shortcomings and want of ability. Without further preface, I will therefore proceed to state my views, and although I can neither speak learnedly nor fluently on the subject, I can with truth say I speak feelingly, having suffered severely the last three years from game. I propose first to point out some of the evils resulting from the over-stocking with game, hares and rabbits in particular, giving an instance that has come within my own knowledge; also one or two extracts from the opinions of noblemen and gentlemen who have seen the evils of preserving game, and, to their honour be it spoken, were good and bold enough to give it up, and turn that time and capital which was wasted on game to the improvement of their estates, and, as a matter of course, thereby adding very materially to the quantity of food produced for their fellow-creatures—the only legitimate use to which land in this country, as a rule, should be put. The instance which I shall quote, and I can myself vouch for its accuracy, took place in the year 1859—that of Mr. Owen Bennion, of Ruckley Grange Farm, Salop. The produce of that farm for twelve and in some instances eighteen months made these wonderful prices:

	A.	R.	P.	£	s.	d.	
Lot 1, a rick of wheat the produce of	5	2	16	...	5	5	0
Lot 2, a rick of rye the produce of...	3	3	0	...	5	0	0
Lot 3, a rick of barley the produce of	8	0	0	...	5	0	0
Lot 4, a rick of barley the produce of	9	2	14	...	11	0	0
Lot 5, a rick of barley the produce of	16	1	14	...	0	10	0
Lot 6, a rick of barley the produce of	11	2	14	...	17	0	0
Lot 7, a rick of wheat the produce of	17	2	10	...	3	0	0
Total	72	1	25	...	46	15	0

Here we have the produce of 72 acres of good land sold for the enormous sum of not quite £47, about one-thirteenth part of what it should have been, but for the vermin called game. But I have not quite done with Mr. Bennion's sale, for the grass keep was sold as well as the corn. There was a large quantity of meadow land, which had been boned at the ten-

ant's expense in 1857, and had no stock upon it except rabbits from the 22nd of September, 1858; and the produce of this up till the 2nd of February, 1860, a period of eighteen months, was sold for 7s. 9d. Mr. Bennion stated with regard to the farm, that he had sown upon it 12 tons of artificial manure, a fact which the spectators did not seem to doubt, as they considered the farm in an excellent state of cultivation. The eating of the young seeds on 45 acres up till the 1st of November was sold for 6d. per acre; this took place on the 20th September, 1859, before the rabbits were made game. Pity our wise legislators had not made the rats game as well as rabbits, then they could have ensured in some cases the total destruction of the crops. There is a blessing promised to those who feed the poor, and a curse pronounced against them *who withhold bread!* and in this case both blessing and curse are literally fulfilled; for, the tenant is still upon another farm a happy and prosperous man, highly respected by all who know him; and the landlord is become an insolvent debtor, detested by all good men. I could point to many cases where the tenant has been fairly eaten out of house and home by the game; but for the purpose of bringing the matter forward for discussion, I hope this will suffice. I may mention incidentally that Mr. O. Bennion left the farm and brought an action against his landlord, and obtained heavy damages from him; but all are not in the same position as Mr. Bennion was! If you say the farmer who suffers so much from game is at liberty to leave and take another, I answer with many it is impossible, and in two ways it is so: First, they are so impoverished by the game eating their crops that they have not capital sufficient left to take a farm where game is not preserved; for a landlord who is not a game-preserved is, as a matter of course, an improver of his estate, and wants tenants of both skill and capital. He would, therefore, hesitate to take in a tenant who was leaving a farm, without making some inquiries about both the capital and the skill of his applicant. The person most likely for him to ask in the first instance would be the landlord or his agent (whose estate he was leaving), and who no doubt is irritated at the man leaving; and he gets such a reply as this: "The farm he is leaving is in a foul state, and I cannot recommend him as a tenant to you, who are so particular;" or, "The man has plenty of means, but he lacks energy, for he has not farmed with sufficient spirit;" or, "He has been very troublesome about game, and caused me some annoyance, so I gave him notice to quit," &c. Either such answer, though perhaps not strictly untrue, would make a gentleman who wanted a good and improving tenant on his estate hesitate about taking on a tenant with such a recommendation. Now, I ask, who can keep a farm as clean as it ought to be, where game is preserved to the extent it is in some quarters? for we all know where the game destroys the grain crop, the weeds fill up the space; or, who can display that amount of energy and skill to raise a crop he is almost certain will be destroyed by vermin nick-named game, as he would do had he only the seasons to contend against? The game nuisance has a most depressing effect both morally and physically on a man. For I defy any farmer, I do not care who he is, to walk through his fields at any time in the year, and find his crops daily diminishing, eaten away by the hares or rabbits, to come to his house either in a good humour or with a good appetite, therefore he suffers morally and physically. Suppose this walk to have been taken in the morning before he goes to market, is he in a likely mood to buy a new and improved implement, a few tons of linseed cake or artificial manure?—all necessary where land is to be farmed high. I say no, he is not! Therefore do not be surprised if a man who is placed in such a predicament should go on the old jog-trot way as long as he can, and spend his all in trying, year after year, to meet his engagements; and when he can do so no longer, then comes the game-preserved, as landlord, and sweeps off the little he has left, for rent, in many cases not leaving a farthing for his other creditors—the tradesmen who

have been helping to carry him on, and who a few years ago counted this man amongst their highly-esteemed customers and friends, and who they see, with sorrow, reduced to the position of a day-labourer, perhaps on the very farm he has been reared upon, and tried hard to keep. You may say this picture is over-drawn; but I say it is not, for what I state is of frequent occurrence. The late Lord Hatherton stated, in his evidence before a select committee of the House of Commons, in the year 1846: "He had enclosed nearly 4,000 acres of wasteland on his property, and consequently become a great farmer. From that time he had generally had 2,000 acres in his own hands under improvement, and he found, to pursue the two occupations—a rigid preserver of hares and game generally, and an improver of land by planting and farming, was perfectly incompatible." Another gentleman, Mr. Pusey, said: "Game-preserving is daily becoming an exclusive luxury for the owners of large property, and less a source of healthful exercise for country gentlemen of moderate means." He adds, that at one time he was a rigid preserver of game, and that he gave it up in consequence of seeing his tenants' crops damaged by the hares and rabbits, and he found "that one of his tenants had given up growing winter vetches altogether, in consequence of the abundance of hares." This was not a sudden determination, but in consequence of what he had observed for some years. He mentions some particular cases of injury which he had seen on his own estates, and says "that it would be almost impossible to grow winter vetches where there is an abundance of hares. I have a strong case now of injury to wheat, which occurred only two years ago. A tenant of mine came to tell me that he must give up his farm; he was a very improving tenant indeed. I asked him why? He said the injury which he received from the game was such that he could stand it no longer. There was a piece of 60 or 70 acres of wheat, and he told me that it had been completely fed away by game from a neighbouring cover; and he asked me go over it. I did so, and I can state positively to the committee that half of that field I should not have known had any crop at all upon it; this was light land. I said to the tenant that his loss should be valued, and I paid him the loss." A circumstance which made a strong impression on Mr. Pusey's mind was that his game-keeper, who had three or four acres of land near his house in the covers, after cultivating it for eight or ten years, said at last that he must give it up, "because it did not pay him; it would ruin him;" and this induced Mr. Pusey to consider what was the case of the keeper's neighbours round the covers. The injury to this man's land, "which he held rent-free," was so much that he gave up the land. When he first took it, he said "he did not mind the rabbits and hares having a share of it," but after ten years he gave it up. Since game-preserving had been given up, "land round the covers, which had produced nothing before, had become extremely productive." "I should wish to observe that it has been often asked how many hares were equivalent to one sheep on a farm, but that appears to me to be a perfectly unjust view of the question. If you had a score of hares folded like a score of sheep on any part of the farm, they would eat all they could find, and it would be but a small loss; but the question is, what the loss would be if the sheep were allowed to wander over the whole farm, and help themselves where they pleased? If you put the case of a single animal coming into a kitchen garden—if anyone had the right to turn a sheep loose into a kitchen garden of five or six acres—and help himself where he pleased, it is evident that you could not measure the injury to the garden from the mere amount of food that a sheep would consume under ordinary circumstances; then the annoyance to the farmer must be very great. I say that even if you ascertain that three or four hares do not eat more than one sheep, you could not estimate the amount of injury to the farmer by the food eaten by an equivalent number of sheep, because the hares are allowed to help themselves, and to go everywhere where they ought not to go; and independently of that, the positive loss, the annoyance to the farmer who has cultivated his land upon improved principles, is very great. It may be a question, upon certain kinds of soil, whether it is an injury or not to wheat to be fed down; but still, as a farmer myself, I should like to have to decide upon it myself whether I would have my wheat fed down." I would strongly advise all who have not read the draught report prepared by J. Bright, Esq., M.P., for the adoption of the committee of the House of Commons on the Game Laws, in 1846, to do so. They would find

most valuable information therein. One gentleman stated, in his evidence as to an enormous quantity of hares, that there had been forty-six counted on one field of only 12 acres. This was in June, 1846. In February, 1865, I know where there were seventy-five hares counted on one field of wheat of only 6 acres, so that the evil is greatly on the increase; but with that comes the assurance that when things get to the worst they are sure to mend; and I think that I can foresee that if this subject is well discussed, and it can be proved to the satisfaction of the great majority of the inhabitants of this country that they are paying 2d. per lb. more for all the meat they consume than they ought to do, because game is preserved so excessively, and which I hope to prove to you, by a simple calculation I have made, they are doing, that we shall enlist such an amount of sympathy and support from all classes as will enable us to get such a modification—if not total repeal—as will enable the farmer to get a fair remuneration for his skill and capital, and at the same time benefit the whole community—those who uphold these iniquitous laws into the bargain. The only difference will be that game will be kept in moderation, and they (the landlords) will become what their fathers were—sportsmen in the true acceptation of the word, viz., hunt their game, and kill it; instead of, as at present, making themselves aristocratic butchers, by having it driven to them to be slaughtered. I have heard it alleged, as against the tenant-farmer, that he does not look up to and show that respect to his landlord which has hitherto existed between them; but the landlords should remember that there is a wide difference between the fine old aristocratic lord of yore, and the half-butcher, half-poulterer, game-dealing lord of the present day. Rearing and keeping game in a tame state to be slaughtered at leisure is a very different thing to what the old sportsman thought about when he said: "You have small satisfaction in shooting a fat buck in your own park; kill a stag in the Highlands, and you are in ecstasies! I do not think there could be found many farmers in England who would not feel a pride in having a sufficient quantity of game on his farm for the recreation of his landlord, and who would not make it a point of honour diligently to look after it, and save all the expense of gamekeepers, night-watchers, and the disguised gamekeepers called policemen. Hear what the Rev. Chas. Kingsley, in his "Water Babies," said about those pests of society, gamekeepers and poachers. "The gamekeeper," said he, "is a poacher turned outside in, and the poacher is a gamekeeper turned inside out." Another source of annoyance to the tenant-farmer is, that he not only keeps an excessive quantity of game for his landlord, but he has to keep almost as much, if not quite, for the keeper and his satellites, to pay their scores off at the public-house. Ned the Cellerman and Dame Margery were not far out, when they sang—

"Oh! oh! oh! the keeper does know
Where many a thousand couple doth go."

Is it not monstrous that a man must not only suffer his crops to be eaten by vermin, but must pay, in the shape of county rates, for policemen to watch that no one hurts that vermin while they so eat it? It may seem to those who have not given this subject a consideration a small matter, and one only in which landlord and tenant are concerned; but I say it is a gigantic evil, and if you will allow me, I will read a calculation I have made, by which I think I shall convince you that the whole community is interested. I will try to show what number of sheep could be kept in place of the excessive quantity of hares and rabbits—mind, only the excessive quantity! For I would not interfere with the winged-game or hares and rabbits in moderation. In round numbers the acreage of England is 32½ millions; take from that 8½ millions for roads, towns, lakes, rivers, and land upon which game is not or cannot be preserved; then take 8 millions more as land upon which game is moderately preserved, it leaves 16 million acres upon which, at a very moderate calculation, one hare or one rabbit is kept per acre. Now, I should say one hare to every four acres is a fair quantity for sporting purposes; therefore that would leave us an excess of 12 millions of hares or rabbits—say 6 millions of each, which for the purposes of food would be worth—

Six million hares at 3s. each	...	£900,000
Six million rabbits at 1s. each	...	300,000

£1,200,000

Taking it for granted that 2 hares and 2 rabbits eat as much as one sheep, it follows that if only the excessive quantity of game was destroyed, 3 millions more sheep might be kept, which at 12 months old would be worth 40s. each, making £6,000,000-worth of food in place of £1,200,000, or equal to an indirect tax of £1,500,000 upon the food of the people, or as large a sum as would pay for all the cattle and sheep imported into this country for more than a year. But this is not all: I only calculate what it would take to keep each of them. But it is a well-known fact that game destroy more than they eat; and again, you do not ensure having them killed off at a given age, like sheep; therefore the sum set down as the value of the hares and rabbits is much over the mark, while at present prices the sum for the sheep is much under it. So if you take it for granted, which I think no one can deny, that 2 hares and 2 rabbits consume as much as one sheep and destroy as much more, you raise the tax on the food of the people to at least £10,000,000—a greater sum, I believe, than was ever paid in one year during the pabny days of protection as a tax on food. But in estimating the loss to the public, we ought not to stop here, for is not the preservation of game the means of preventing an improved mode of cultivation? and therefore keeps that back which ought to be progressive. We have just now introduced another foreign evil amongst our cattle—the rinderpest. Is not the game-laws the native hinderpest? *A propos* of this: I see a correspondent of the Aberdeen journal starts the theory that the hares and rabbits are as likely to spread the cattle plague as sheep and lambs. He says they are moving about on the pasture in hundreds, and many carry infection all over the country. Shall we get an order in council requiring the owners to keep them at home, or giving anyone permission to kill them if found straying? And what is all this wanton waste for, but that a few may display their wonderful powers of slaughter, and then advertise in some sporting paper that they had in so many hours killed so many head of game: thus publishing as something great and to be made public what they ought to be very much ashamed of, and keep as private as possible. Here is a sample of the advertisements I allude to, taken from the *Leicester Journal*: “The Earl of Stamford and Warrington entertained a distinguished party at Bradgate, who in four days killed the following quantities of game:

1864.	Hares.	Rabbits.	Pheasants.	Various.
December 20 ...	363 ...	595 ...	770 ...	19
” 21 ...	226 ...	216 ...	2012 ...	20
” 22 ...	195 ...	340 ...	1524 ...	9
” 23 ...	195 ...	2718 ...	390 ...	18

—total, 9,610.” The Bradgate estate is only 8,814a. Ir. 4p. On his estate at Evville in one day they killed 600 hares, exclusive of other game, in one cover. What an ignoble aim for a man to live for, and spend his own fortune, and rob scores of tenants, to obtain merely that he may be able to exclaim, “I am a great preserver of game; and I and my friends have killed a greater quantity of game in a given time than any other men in England!” Would to God they would also add this great truth—“and have caused more misery in the breaking up of families, sending their fathers to prison, and the mothers and children to the union, and done more destruction to my tenant’s crops, and consequently helped more than any other living being to raise the price of meat to its present height, and to bring down upon the class to which we belong the just indignation of an outraged people.” I wonder if it ever occurs to these great game-preservers and oppressors of their tenantry, that they are themselves only tenants-at-will, and in one respect are worse off than those they so oppress, inasmuch as they cannot demand a six months’ notice to quit, but may be called upon by the great Landlord of the universe to give up at a moment’s notice those broad acres they are so proud of, and which have only been lent to them as so many talents, of which they will surely be required to give an account! If the game preservers can read the signs of the times, they may learn a useful lesson from what befel the godfather of that most wicked *brat* called the Poaching Prevention Act, conceived and brought forth by our born legislators, and adopted by the *mis*representatives of the people in that uproarious and unbridled manner that gave calm and thinking men the idea that many members must have been in that state which we are told is no excuse for the commission of a crime, but rather

an aggravation! When he presented himself before the electors of South Shropshire, did they return him again as their member? No. They gave him what he well deserved, rabbit-skins instead of votes, returning him to that obscurity from which it would have been well if he and the like of him had never come forth. Another sponsor of that wicked brat, who is not particularly fond of music, heard that at Derby which would not sound very harmoniously in his ears. The whole course of legislation has of late years gone dead against the British farmer, and all in favour of the foreign agriculturist. The repeal of the corn-laws, the introduction of foreign cattle, the reduction of the duty on foreign wines and spirits, the remission of the export duty on beer; all these tell hard against the British farmer, but against all these he has striven manfully, and would continue to do so, if let alone; but his friends the lords of the soil say, “We must still further clip his wings, or he will be able to rise yet. We must eat up his crops while growing, and forbid him to poison his enemies, the sparrows and other birds that take his crops when ripe; make the vermin rabbits game, and if he asks that he may use the produce we leave him as he pleases, we say No! On one part of it at least we must have a tax of 30 or 40 per cent.: because we have remitted so many taxes for the benefit of the foreigner we must still contrive to grind the native.” The old story, “Send missionaries to the blacks beyond sea, but neglect the blacks at home.” I would suggest for the consideration of the Malt-Tax Repeal Association if they have not made a slight mistake, and put the cart before the horse, in trying to give the working-classes cheap beer instead of first giving them cheap meat. Meat and drink; not drink and meat. They have already cheap bread, give them cheap meat; at all events, don’t tax it for the benefit of a few, and I am very much mistaken in the British workman if in a very short time he does not demand from them who have made wine cheap—which the working-man cannot get—the repeal of the Malt-tax, so that that native beverage, which he can and must have, shall be cheapened also. Farmers of England, the repeal of the Game-laws and the repeal of the Malt-tax are justly due to you, and do not be satisfied until the debt is paid. It has been well said that those who by their skill make two blades of grass grow where only one grew before are benefactors to their country. What then shall be said of those who make a sheep grow worth £2 where only two hares grew before worth 5s. or 6s.? This I hope to be the mission, under an all-wise Providence of this club, by bringing this crying and ever-increasing evil before the notice of the public. As the potato disease was through the all-wise dispensation of Providence made (by raising the price of corn to an almost unbearable height) an instrument in the hands of the great Sir R. Peel, which enabled him to carry that great and good measure the repeal of the corn-laws, so may we hope that the cattle plague from which we are suffering may, by raising the price of meat to the enormous height it is at present, be made by the same all-wise and merciful Providence the means of strengthening the hands of some other great champion of the people, who shall bring forward a bill for the total and immediate repeal of the most iniquitous piece of class legislation ever enacted in any country. The energetic way in which the people of Birmingham demanded the Reform Bill was to a great extent the means whereby that measure was obtained; Manchester gave us the repeal of the Corn-law; and now may the blessing of Providence so rest on my humble endeavours to point out the evils of these wicked laws, that this meeting may be the means of so opening the eyes of the inhabitants of this great town, that they shall make themselves so well acquainted with their own and their fellow-countrymen’s true interest as to demand in a firm but quiet manner their repeal, and thus render to posterity a blessing in no way less than that conferred by the passing of either of the other two great measures.

At the conclusion of the Paper Mr. Robotham said he had had a correspondence with a good many persons, and among the rest the respected member for that borough, Mr. John Bright, and, with the Chairman’s permission, he would read it:—

Rochdale, September 30th, 1865.

DEAR SIR,—I am glad to hear that you are about to read a paper on the subject of the Game Laws. I do not think much good would be done by holding a meeting in Birmingham.

The towns are known to be against the game laws; but so long as the county constituencies send game-preservers to Parliament, the members for the towns can do nothing for the farmers. It is about twenty years since I gave much time and labour with a view to relieve the farmers from the evil of the game laws, and I spent at least £300 in bringing before them and the public some of the facts of this great grievance. Up to this time nothing has been done in the way of relief, but, on the contrary, the laws which favour the preservation of game have been made more strict. I fear the evil has become not less, but greater, and I see only one way in which any real improvement can be made. It can only be done by having in Parliament a larger number of representatives of the people, and fewer representatives of a class, and of the prejudices and usurpations of a class. How can this be brought about and secured? By the admission of another million of the people to the elective franchise, so that the House of Commons may become truly representative of the true interests and wishes of the nation. But there is one thing which the farmers may do for themselves, whenever an election for a county takes place. At present they are not asked who shall pretend to represent them, but the lords and squires of the county name the candidate, and, as a rule, the tenant farmers vote for him, and he enters the House to do the work of the lords and squires who selected him; a main part of that work is to keep guard over the laws which favour the preservation of game. I know how many reasons there are why a tenant should be disposed to support the nominee of his landlord. He feels in how many ways his landlord or his landlord's agent can annoy and ignore him, and he submits to a power which he has not learned to resist. But the time is coming when tenants will dare to believe and act for themselves in the performance of their political duties. They can combine with great ease, and when combined their power is irresistible. I hope the day may soon come when they will take the election of members in the counties in some degree into their own hands, and when this is done their political and social deliverance will be secured. You will see at once how easy it is for you to combine. Every farmer has a horse and a gig, or dog-cart, or conveyance of some kind, so that he can go to the poll without any cost to himself. Farmers meet almost every week at their market town, and they can know the feelings of their class without difficulty. In every county they should select a "farmers' candidate." If a good tenant farmer can be selected, bring him forward; if not, then some other respectable and intelligent man. If you can find a landowner who is willing to be just to the tenant farmers, both in his own private conduct and respect of legislation which affects them, take him as your candidate, and give him a zealous support. You can contest a county at almost no expense. A subscription of one pound from each tenant will raise a sum large enough to pay for all the printing you will require, and you can take yourselves and your neighbours to the poll at a trifling expense. The farmers' candidate will be the popular candidate. The Liberals in the towns will give them their support, and you will carry him into Parliament to do the work of the farmers and of the people, instead of that of the lords and squires. Some will say I am advising you to work a revolution; and so I am. It will be a revolution that will transfer the county representation from a dozen rich men, or families, to the real people of the counties. It will send members to Parliament who will care more for the rights and interests of the population than for the semi-barbarous sports of a class. When the tenant farmers see their power, and arouse themselves to exert it, the days of the game laws are ended, and there will not be wanting just and good men among the landowners themselves who will give them a hearty co-operation in the good work. As to changes in the game laws, I see no great good in them. What you want is the repeal of all laws which are made with the object of favouring the preservation of game. The fundamental principle of the tenant farmers should be this—that they should have absolute and undisputed ownership of, and control over, all animals which live upon the produce of their land. They occupy land and pay rent for it; they risk all they have—their money, their time, their labour, their hopes, their present, and their future, in the cultivation of their farms. The horses, cows, sheep, and swine are theirs; the crops are also theirs, and the hares, and rabbits, and game of every kind living upon their farm should also be theirs. Till this is the settled law, and also the practice of the country, the tenant farmers will never hold the position to which they have a just claim, and the evils of game laws and game preservation will never be wholly removed. At present it is impossible for your friends in Parliament to do anything for you. You can do much—I think you can do everything—for yourselves. Let it be a rule that no tenant farmer will support a candidate who is not in favour of full justice to tenant farmers, and the whole character of county representation will be changed. I would advise your committee to correspond with farmers in every county in the kingdom, and to exhort them everywhere seriously to consider this great question, and to prepare to act when another general election shall take place. Your deliverance from the insulting griev-

ance of which you complain rests mainly with yourselves.

I am, very respectfully yours,

JOHN BRIGHT.

Mr. A. Robotham, Oak Farm, Drayton Bassett,
near Tamworth.

The VICE-CHAIRMAN said Mr. Bright's letter was for the most part a perfect piece of nonsense.

Mr. BRAWN moved a vote of thanks to Mr. Robotham for his valuable paper—a paper which they would agree with him was forcibly and feelingly written. Game was considered a very great delicacy, and he had frequently been told that the game question was a very delicate subject, and that any attempt on the part of farmers as a body to discuss it would lead to very serious misunderstandings between them and their landlords. If ever there was a time when that bond of union which existed between landlords and tenants required to be strengthened, that time was the present. The tenant-farmers had for the last five or six years been labouring in vain with respect to this subject. We are unwilling to believe that a plain, straightforward, moderate, and respectful remonstrance respecting an undoubted grievance must necessarily bring down upon them the displeasure of their landlords. It was always pleasant to look on the bright side of any picture; and what brighter picture was there in this little England of ours than an English gentleman living in his ancestral home, surrounded by a grateful and a prosperous tenantry (cheers)? But while they could not but warmly acknowledge the efforts of such landlords to make the welfare of their tenantry their chief concern, there is no wisdom in disguising the fact that there were estates where the tenant-farmer, in his struggle for subsistence, met with very little consideration—where game accumulated and crops decayed, where the field-sports of landlords sometimes resembled the exploits of Cockney sportsmen among Cockney fowl, where the gamekeeper was monarch of all he surveyed, and was permitted to sour the temper of the farmer, to be the greatest annoyance of the farmer's wife, and the deadly enemy of her cats (laughter). He was willing to believe that, in some districts at least, these occurrences were more rare than formerly; still he would respectfully remind those whom it might concern that, while in this state of transition, hard-working men were being ruined, and their families reduced to poverty, and the working man was being deprived of his daily food. A dispute about game had come under his own observation this present season. The tenant was an excellent farmer, and laid out capital liberally—some would say lavishly—upon the soil, and the landlord was a man who wished to do his duty; but he had a gamekeeper, who resembled Cobbett's farm-waggoner—he not only managed the animals, but he exerted a pretty smart control over the owner of them; and the result was that a good landlord and a good tenant were brought into a state of hostility, and wounds were opened which it would be difficult to heal. With respect to the damage done by game, he met at different times during the present summer with two farmers from different parts of the country, and having got over the usual salutations about health and the weather, he asked, "How are your mangolds?" (laughter). They answered in pretty nearly the same words—"O, I shall have none; the hares eat them off when they were about as thick as my finger" (laughter). He would ask them who were revelling in the prospect of 30 tons of mangolds per acre, how they would like that? And he would leave it to people who were fond of calculation to say how many tons of mangolds each of those hares consumed whilst indulging in these finger luxuries, and how many carcasses of beef and mutton did they consume in the same time? (Hear, hear). Mr. Robotham had alluded to the late Lord Hatherton's statement, and there were few higher authorities on the subject than his lordship, according to whom high farming and strict preservation of game were utterly incompatible (Hear, hear). Now high farming meant more manure, heavier root-crops, better corn-crops, abundant supplies of beef and mutton; and if the promotion of these things and excessive game-preserving were utterly incompatible, he thought farmers ought to be pardoned for asking their landlords to take the matter into their serious consideration (Hear, hear). There was one point on which he differed from Mr. Robotham, and from very many of his brother-farmers, and that was respecting the "Night-poaching Act." He believed that every time a gamekeeper laid his hand on a poacher, he came in contact with a thief (Hear, hear); and he had no desire to encourage that class of persons. But he spoke volumes in con-

denunciation of the game-preserving system, that made the tenant farmer look upon the midnight depredator as his best friend, and the thief-catcher as his most inveterate enemy (Hear, hear). He had heard tenant-farmers express their fears that the preservation of game would become more fashionable—that this excessive preservation and wholesale slaughter were indulged in by royalty. He could only say that, if such was the case, he could only hope that royalty would grow older and wiser, and that princes and nobles would enjoy the legitimate sports of the field, of which he was sure no farmer wished to deprive them, and that they would give up that wholesale butchery which reminded one of heroes crushing flies (laughter and Hear, hear). That the game-laws required alteration he thought was unquestionable; but he could not say that he had studied the subject sufficiently to enable him to propose a remedy, and he should therefore not detain the meeting longer.

Mr. H. OSBORN said he was pleased with the temperate tone that had hitherto pervaded the meeting, and he hoped it would be continued on to the close. He must say he rose to address them that day with a very strong conviction of the importance of the question they were discussing, and he was decidedly of opinion that the excessive preservation of game was fast assuming the dimensions of a national calamity, and he was quite sure it was fast undoing the ties which they all enjoyed formerly to see between the cultivators and the landlords of the soil; therefore he thought whether in towns or amongst the cultivators of the soil no more important question could be brought under their consideration. He was pleased with the notion Mr. Robotham threw out, and which was confirmed by Mr. Brawn, and which he could confirm by his own experience, that the preservation of game in many districts had been carried to such an excess, as to greatly increase the price at which meat might be provided for the labouring classes of the country. He thought their friends in town who were wondering the price of meat had got so high, might see some solution of the difficulty, when they knew that on many estates one half of the produce was frequently destroyed by game. The question had been looked at in several aspects; but before he went any further, he should like to make a remark on the letter they had received from their president, Mr. Chawner. No man had more respect for him than he had, and there was no one whose opinion he would sooner take on agricultural questions than Mr. Chawner's; but he thought there was a glaring error running through the letter he had sent them that day. He seemed to assume that every tenant farmer was just commencing his tenancy. Now he would tell them what was the position of the great bulk of the tenant farmers of the country. Every landed gentleman almost was connected with some agricultural association, at which he made speeches on various agricultural topics—on the necessity of improving the cultivation of the land. How was that to be done, except with an extra application of capital? They might go on a farm, and meet a landlord who would talk fair to their face, and tell them he would not allow them to have their crops destroyed by game. The tenant proceeded to lay out his capital on the land, and as soon as he was bound hand and foot to the landlord his crops were eaten up. If the preservation of game continued as it had done within the last few years, they might bid adieu to all improvements in agriculture, as he was sure the farmers could not continue to lay out their capital as they had hitherto done if there must be such a system, which was fast spreading. He did not make any charge against the great body of the land-owners of England. There was no one who held them in higher respect than he did, or who would sooner support them in their legitimate rights. Although he agreed with Mr. Bright in his detestation of the game-laws, he disagreed with many things in the letter that had been read from him that day. He for one was not prepared to identify himself with all the sentiments of that letter (Hear, hear). There was another aspect of the question—the mode in which the game laws of the country were carried out—that had not been sufficiently dwelt upon that day. It was a few individuals in this country who were by their excessive preservation of game giving such an impetus to the trade of poaching, and by holding out inducements to poachers, were manufacturers of thieves and criminals. They also caused a higher price of meat, threw an increased amount upon the poor's rates of the kingdom, and caused an immense amount of criminals to be kept at the ex-

pense of the rate-payers of the country. He thought the time had come when the farmers should make their voices heard, as they could not continue to cultivate the soil if one-half of the crops were to be destroyed; and when public opinion was enlightened in this country, and they knew the reason why the price of meat was raised to such an extent, they would soon have that opinion in their favour, and it would be said that no class of people should be able to keep up a code of laws that impoverished their fellow-creatures, added greatly to the criminal returns, and did no good to any individual. He had great pleasure in seconding the vote of thanks to Mr. Robotham.

The resolution was then put and unanimously carried, at which Mr. Robotham returned thanks.

Mr. OSBORN then proposed the following resolution: "That this club desires in the most emphatic manner to call attention to the serious losses which were being inflicted on tenant farmers in many localities by the excessive preservation of game, and to the necessity that exists for a general and earnest appeal to be made to landed proprietors in order to induce them to take immediate steps for abating the evil."

Mr. JOHN LOWE said the question as it then stood before the meeting seemed to him to be rather confused. He thought it should be discussed under two heads—firstly, the game laws of the country generally; and secondly, the preservation of game as between landlord and tenant. It would appear from what had been said by most of the speakers that they considered that the landlords, that was the game-preserving landlords, were responsible for the game laws. He thought that was not quite true. He was willing to admit at once that he believed the time had now come when a very great and important alteration in the game laws should take place. But, as he had said before, he thought they should distinguish between the evils occasioned by the game laws on the one hand, and those on the other which were owing to the disposition of the landlord. If they tried to make the landlords responsible for the game laws, he thought they would be trying to place upon the landlord's shoulder a greater burden than they ought to be expected to bear. He therefore hoped they would approach the House of Commons simply on the question of the game laws; and according to his notion the first approach to that House should be made by way of petition (Hear, hear). That course seemed to him to be the one which was at once the most legitimate under the circumstances and the most likely to produce what they all required, namely, a very extensive alteration in, if not the entire abolition of, the game laws. He did not mean to give an opinion as to whether their entire abolition was desirable or not; but unquestionably they required to be at least considerably revised (Hear, hear). Then, as to game-preserving landlords, they must be dealt with in another way. He thought tenants had the matter in a great measure in their own hands. They should refuse to take land from game-preserving landlords. [A MEMBER: It would not do.] He thought that so long as the farmers themselves were willing to take farms on which game was preserved to an improper extent, so long would the preservation of game have to be complained of by them ("No, no?"). If there was not an anxiety to possess such farms, landed proprietors would alter their views and their course; but so long as tenants were willing and anxious to take farms, knowing that they were overstocked with game, he thought there was a good deal of blame to be attributed to themselves for the evils they suffered (Hear, hear). In his opinion the most effective way of endeavouring to get redress for this great grievance of the game laws was to petition the House of Commons to inquire into the subject. The resolution which had just been proposed was so much in accordance with his views that he had very great pleasure in seconding it (Hear, hear). He was delighted to find it was so politely worded (laughter and Hear, hear). That was the proper way to approach the subject (Hear, hear). He was afraid that some course hardly so well-considered and courteous might be proposed. He was bound to say that some portions of the paper read by Mr. Robotham were too plaintive, without being suggestive of how to get rid of what they had reason to complain of. But as the resolution was so moderate and so courteously worded and so much in accordance with his views, he had very great pleasure in seconding it. He thought the members of the club and all advocates of their view of the question now under discussion ought to make up their minds to keep most determinedly free of all political feeling on the sub-

jeet (Hear, hear). It was not a question whether a bill should be brought in by a Conservative or a Liberal. The question ought to be discussed without any reference whatever to political matters, which were wholly beside and apart from it, and had no relation to it whatever (Hear, hear).

Mr. KING said he concurred in the resolution, and thought it a reasonable and straightforward way of introducing the grievance to the notice of those whose duty it was to redress it (Hear, hear). He agreed with Mr. Lowe that the question ought not to be allowed to assume a political aspect. If they could not look with confidence for justice and protection from noblemen and men of birth and education, he was afraid they would never obtain them from pretenders and upstarts (laughter and "Oh!") A MEMBER: "That is hard on Mr. Bright". Mr. Lowe thought tenants might redress their grievance wholly by refusing to take farms from game-preserving landlords. Mr. Lowe seemed to think that it was only the tenants who were liable to vicissitude, that landlords never changed. But he would remind Mr. Lowe that landlords were but tenants at the will of a higher Power than any on earth, and that they had to quit on very short notice. They did not always get six months; and their successors might be very different men from what they were. He had known many tenants who under their old landlord preserved the game on their farms and killed it or did as they pleased with; but a new landlord came in, and things were quite altered. It did not suit them to move off with their old landlord, and so in some instances they had had to endure vexations and losses and oppression. He referred to the tendency of excessive game-preserving to foster criminals by increasing the temptations to poaching, which always led to crime. He had seen enough of game preserving and its consequences to know that a game-preserving landlord was an enemy to himself, an injurer of his country, and the ruin of his tenantry and his neighbourhood. He hoped that meeting would not separate without putting on record a most emphatic protest against excessive game preserving and all the evils to which it gave rise.

Mr. BIGGE, agent to Lord Wenlock, said that at the discussion last autumn on the question of farm-agreements, a great deal was said about game preserving. After that meeting he thought a good deal on that subject; and as he happened, he was glad to say, to be in a position to try an experiment on the question of game as between tenant-farmers and landlords, he immediately set to work to put it in force on some estates in Shropshire which he had the honour of managing. The first thing he did was to discharge all the game-keepers on the estate (applause). Having done that, at the audit dinner he mentioned to the tenant-farmers what he had done, and he was glad to say it met with their full approval. At the same time he intimated to them that the landlord was fond of shooting; that he wished to reside on his estate, and wished to live in amity with all his tenants (Hear, hear). They one and all said they were certain they would preserve more game on that estate than the keepers did (Hear, hear). At the same time they had liberty to destroy, at every season of the year, by ferrets, but not to shoot on their farms. With this they were quite satisfied. This year there was an exceedingly good shooting season. Instead of killing 250 brace in a week's shooting, nearly 400 were killed (Hear, hear). That was a practical proof of what tenant-farmers, if they were treated in a liberal, straightforward manner by their landlords, would respond to (Hear, hear). He hoped the experiment would continue to be successful, and that, in future discussions in that club, he would have the pleasure of reporting favourably with respect to it (applause).

The VICE-CHAIRMAN: Were there more hares and rabbits on the farm than in previous years?

Mr. BIGGE: No rabbits at all, or very few.

The VICE-CHAIRMAN: Were there more hares?

Mr. BIGGE: There were plenty of hares for shooting.

The VICE-CHAIRMAN: The same as the year before the keepers were discharged?

A FARMER: They didn't want as many by a long way (laughter—Hear, hear).

Mr. BIGGE: It has been a bad season this year, but I think there have been quite a many.

Mr. BURBURY, of Kenilworth, said there was one phase of the question which had not been brought before the meeting—the sub-letting of manors (Hear, hear)—the owner letting the shooting of the manor to a stranger, whether the tenants were

willing or not. He believed that in law a gentleman taking the shooting of a manor was not liable to the tenant for the injury done by game. He believed an action would lie against the landlord, but not against the person renting the shooting. A great improvement in the law would be to make the owner of the game for the time being responsible to the tenant for damage done by the game. That would go a great way to remove an evil of which many tenants had now to complain. There was another question: he perceived that many gentlemen advocated a total repeal of the game-laws. Now while they were met there as tenant-farmers they should bear in mind the precept to do as they would be done by. They should imagine themselves in the position of owners of land; and, if they did that, they would see that with the total abolition of the game-laws would arise a necessity for a very stringent trespass-law (Hear, hear).

A MEMBER: A very good thing, too.

Mr. BURBURY: They should well consider the position in which they would be placed by a trespass-law of so stringent a character that it might be made to operate very vexatiously. Many of them were in the habit of occasionally crossing their neighbours' land. He knew it was the case in the neighbourhood from which he came. Now, under a very stringent trespass-law, they might find themselves brought up before a magistrate for crossing their neighbour's land. In reference to the sub-letting and shooting, he suffered severely from it himself. He should like to be able to go at the person shooting, for the damage he had done. He knew an action would lie against the landlord; but every one knew that actions by the landlords, whether successful or not, produced ill-feeling which led to notices to quit.

Mr. LYBOTHAM said he thought there would be very little use in appealing to the landlords: they should appeal to the House of Commons.

Mr. HOUGHTON: When the Edinburgh Farmers' Club discussed this question some time ago, they came to a practical conclusion. They decided upon petitioning Parliament; and the first and the main point upon which they petitioned was that hares and rabbits be dropped from the game list. Could not this Club adopt something of that sort, and second the endeavours of the Edinburgh Club by doing the same thing (Hear, hear).

Mr. T. D. LAWDEX: Suppose we succeeded in having rabbits and hares dropped from the game list, what would be the consequence? Landlords would simply say: "It is true rabbits and hares are not on the game list, but if you kill them nevertheless, you shall not remain on my property." If they could get landlords to see that it was not for their interest or that of their tenants that too much game should be preserved, they would have done all that was necessary.

Mr. R. H. MASEN said he thought there was one thing in the question that every one ran his head against, which was that the tenant was the owner of the hares and rabbits, and pheasants as well. It was no use dividing the matter: the more they dissected it the more intricate they made it appear. When he took his farm and they took theirs, they took the hares and rabbits at the same time, until they committed their hands to paper which contained a clause to this effect, "That I reserve the hares and rabbits to myself." So that really and truly it was an act the farmer himself committed. The law of the land gave them to the tenant, who by his own act parted with it. That was the law, he believed. They had heard a great deal of the damage done by game; but there was other damage besides what had already been alluded to. To a great extent it was that waste of capital which debarred a man of industry from investing it in land without an amount of security for its proper return. They all knew he had spoken, written, and conversed on the game question again and again, and the question was spoken of at the time he read his paper on "The Tenure of Land" last December. That gave him an opportunity of a large correspondence with different gentlemen in various parts of England, and the disclosures made to him were such as he for one was not aware of. On one estate of 16,000 acres, the landlord had never allowed a reaping machine or a steam plough, and the tenants had been compelled to leave five feet of hedge-row for the preservation of game (cries of "Shame"). So long as that existed it was no use their talking about their grievances unless they came forward with some mode of redressing them. He was the last man in the world to wish to separate the interests of

landlords and tenants. He was proud to have an aristocracy among them who had found good farms and homes for hundreds of thousands of men. If the landlords were a different class of men as regarded birth and position, the condition of the tenants would not be improved. In the first instance, they heard, in the paper read that day, some startling assertions made. He wished to ask by whom was the land owned? Not by an old territorial possessor, but one who was a very few years ago in a very different position. It was one of Mr. Bright's school.

Mr. ROBOTHAM: It was not one of Mr. Bright's school.

Mr. MASFEN: There were exceptions to all rules. There were some of the aristocracy whom they felt proud to rent under, and others the reverse; but it was no use trying to set class against class to remedy that evil (Hear, hear). There was no remedy in that; but the remedy was to try to shun men who had made such restrictions to leave the hedge-rows five or six feet wider than others for the preservation of game, and who could not allow reaping machines or steam ploughs on their property. It was a happy thing for Old England when a landlord and tenant could agree and live together. His late landlord, whom he had great pleasure in finding sport for, told him he never enjoyed so much sport as he did after a discharge of his gamekeeper, and made him and his labourers preservers. He was happy to say there was an example in a neighbouring county of a large landed proprietor acting up to the views of an humble individual like himself, in giving orders to his agents to discharge his keepers and put his tenants in charge, and there had been an increased amount of game killed this year, something like 70 per cent. It was not when the game was in the hands of the first party that damage occurred, but when it was in the hands of a third. A tenant naturally felt a desire to find his landlord sport, but he did not feel inclined to find it for a man who offered so much for as much as he could provide. There was another instance, and he was sorry to say he suffered from it. They knew well there was no mutual tie of good feeling between a man who farmed land under a landlord and the man who took the game upon it. He went for mere sport—for preserving the game to the utmost and destroying the greatest amount of head he could. Those were grievances under which they all had to suffer. After a man had been called upon to pay the greatest amount for rent, then to be compelled to find the greatest amount of game for a third party, was, he thought, against the idea of every free-born Englishman. Mr. Robotham, in his paper, related to the amount of food they would be able to produce, supposing the game was cropped down to a quarter the extent it was now. He had stated the amount that might be produced in beef and mutton, but he did not say the amount in an acre of corn that might be produced if game were not preserved to such an extent as it now was. He dare say they remembered the case he referred to, during the discussion on the "Tenure of Land," of a farmer in Wiltshire who fenced off a portion of a field, and had more in that portion, by three times the amount in proportion, than in the remainder of the field, when it was thrashed. How far would that have gone if they were to have the hares and rabbits pretty nearly annihilated? He did not want to see so many hares and rabbits as they had. He did not think the winged game so prejudicial, and they had no objection to find sufficient for the sport of their landlords, but not for hatter-mongers and professional poulterers. As regarded the proposition of dividing the hares and rabbits, he could not say he was satisfied with it. He believed the proposition put to the club some time ago by Mr. Bigge was more to the purpose—that if they were to pass a resolution requesting the landlords to sweep from the earth that baneful nuisance gamekeepers, they would do an immense amount of good (Hear, hear).

Mr. ROBOTHAM said, with reference to Mr. Masfen's remarks, if they would remember, he stated in his paper, with reference to the large quantity of grain destroyed by hares and rabbits, that he should leave it to other gentlemen better able to point out. He did not intend to point out all their grievances himself. His friend Mr. Masfen had pointed out the other portion, and he thanked him for it.

The resolution was then put, and carried unanimously.

Mr. OSBORNE said he had one other resolution to propose, and it would rather complete the matter if they were to pass it that night. The resolution was: "That the excessive preservation of game is not only injurious to the tenant-farmer, but at the same time is a fruitful source of crime,

entailing a great annual loss in prosecutions, which are increasing from year to year; while the game-laws at present in force are most objectionable, as leading to the opinion on the part of a portion of the population that those laws are the result of class legislation, and prejudicial to the welfare of the country at large." With respect to the expense of prosecutions, he stated that during the past year there were more than 10,000 prosecutions for infraction of the game-laws. He did think that those persons who preserved game to such an extent, especially rabbits, were responsible to the country for the excessive amount of expense incurred in those prosecutions. (Hear, hear.)

Mr. T. B. WRIGHT seconded the resolution. He said he was disposed to take a more hopeful view of the subject than some of the gentlemen who had preceded him. He should not say much with reference to the letter of Mr. Bright, because probably it went more into politics than was consistent with the character of that club. (Hear, hear.) The reference Mr. Robotham made to Lord Hatherton's opinions was to be found in an article written by Mr. Bright in Morton's "Encyclopaedia of Agriculture." They all knew the admirable example set by Lord Hatherton in respect to game preserving. His lordship soon found out that to farm properly it was necessary to give up game preserving. The article in the "Encyclopaedia of Agriculture" was brief, but it took up nearly every point, and, amongst others, the one in the resolution which had just been submitted for the approval of the club, the increasing number of prosecutions. As Mr. Osborne had told them, that evil had been on the increase from year to year. He did not think he ever read an article which put the whole question in a better way than it was put in the article by Mr. Bright; and he felt bound to give this expression of opinion with regard to it. He thought they might look hopefully to the future. Lord Hatherton set the example 20 years ago. Mr. Randall, of Chadbury, near Evesham, said distinctly, in a discussion which took place on tenant right, that on some of the estates which he managed in Worcestershire no game was preserved, except winged game. That was an instance of progress.

A MEMBER: It is very slow.

Mr. WRIGHT: Probably a number of other instances might be mentioned. Reference had been made to some landed proprietors who would not allow a steam-plough or a reaping-machine on their estates. But they knew very well that such landlords were exceptional, because steam-ploughs and reaping-machines were made every day, and they were not made for show, but were sold and used. He knew a tenant farmer who declared with tears in his eyes that he would be ruined by excessive game preservation. Yet there had been a considerable improvement during the last 20 years. (No, no.) He quite agreed with Mr. Masfen that the way to extend improvements in agriculture and to increase the prosperity of tenants and landed proprietors, and the welfare of the labouring classes, and of every class of the community, was to foster feelings of confidence and good-will and mutual respect, and to show that the interests of landlords, tenants, labourers, manufacturers, and all other classes were one. The resolution which had just been proposed seemed to be very temperate and just, and he had great pleasure in seconding it.

Mr. ROBOTHAM proposed, as an amendment to the last resolution, "That the present system of holding farms wherein the landlord exercises the sole and exclusive right to the game is strikingly selfish and unsatisfactory, and in its operations exhibits the fallen and servile condition of the tenant-farmer in submitting to the powerful but unjust dictation of the landlords as exemplified in their one-sided and unnatural agreements, leading to a great imposition and ill-feeling, that frequently terminates in the ruin of tenants. The system called aloud for the exercise of the joint and mutual co-operation of all parties interested by restoring proper independence to the farmer, and rescuing their property from destruction."

Mr. SYDNEY said: In taking a farm he had no restrictions as to game, or any other nonsense. That evil and nuisance rested entirely with the tenants themselves. He was desirous of taking another farm, for his son, and he had had the refusal of several good farms, but he had declined them on the score of the blackguard game question (Hear, hear). Were they to go on in that state of things, and beg the question from the landlords and aristocracy of the country? He was not for begging the question at all. When he took a farm he intended to pay the rent, but he did not intend to keep another man's

stock. Pretty well if he paid his way, which of late years farmers had some difficulty to do. They all understood that the question was one of rent, after all was said and done; therefore he agreed with Mr. Chairman that the game question was a question of rent; and if they were determined to take those game-preserving farms they must go about it in a business-like way, and say, "Now this farm is inundated with game, therefore I will not take it unless I can have it with the rent accordingly."

Mr. MAX: No "unless."

Mr. SYDNEY: But they took the farms, and grumbled afterwards. Now, he wanted them to do all the grumbling first. If they would all act on the principle of not taking those game-preserving farms, they would have nothing to complain of. He hoped in what he had done he had set an example. He would not take a farm under a game-preserving landlord. After one of their previous meetings, during the tenure of land discussion, he had the honour of riding with Lord Lichfield, and the whole conversation came up. His Lordship said he (Mr. Sydney) could not expect to take a farm on the conditions he had stated. And he replied, "Of course he did; and he had got one; and no doubt he should take another." He farmed to the best of his ability, and spared no expense; but tell him he was to have his crops destroyed by vermin, and he said he would not. And so he told Lord Lichfield that he would shoot any mortal thing that ate his crops. He assured them what they had to do was to make a firm stand, and not take the farms if they were to be robbed (he could give no better expression to it than "robbed") (cries of "The right term") of their property by the unlimited support of game. How many tenants were there who took farms with a limited quantity of game, but in a short time the game increased tenfold? They then went and lodged a complaint against the game, and the landlord told them if they did not like the farm they might leave it. That was very nice satisfaction for a man who had laid out all his capital and made all the improvements he could, expecting to stay sometime! He (Mr. Sydney) said they ought to do away with such rubbish. They should not take a farm under a game-preserving landlord till they had mutual covenants with the landlord for game. Say to him, "I don't want to deprive you from coming on my farm to sport: I should be glad to see you every day; but so long as I keep this stock why should you deprive me from sporting? Do away with your keepers, and I will answer for sufficient sport."

Mr. JOSEPH WRIGHT, of Etwell, thought the question had been treated well, and with a deal of delicacy by the Club. If there was time he could keep them the whole of the evening, telling them of disasters that had befallen himself; but he had heard so much of damage done that it would only be a tale

told over and over again, which he had no wish to do. He did not think it would answer the purpose of the Club to adopt the resolution of Mr. Robotham, as he thought by that means they would make very many enemies and very few friends. They were making progress, but very slow indeed, because they only found two or three landlords who had fallen into those liberal views during the last twenty years; during which period how many tenant-farmers had been ruined! He thought they ought to act as temperately as possible in introducing the question. He agreed with Mr. Sydney in not taking game farms, and he had given one up himself on that account. He thought he had sufficient capital to stock the farm, and would not trouble his landlord (Hear, hear). His friend Mr. Robotham had instanced Lord Stamford in his paper. He had no occasion to have gone that distance. He might have taken an instance in his own locality, where there had been more than £2,000 a-year taken out of the pockets of a tenant by a landlord, by the preservation of game. It was time some alteration was made, and it was necessary they should go tenderly to work, and he did not think that was the proper time for them to adopt Mr. Robotham's resolution. Everybody interested in that great question must have seen lately the immense amount of money sent out of the country for foreign corn, and at the same time those hares and rabbits had consumed as much food as was necessary for the support of the labouring population. Mr. John Bright (for whom he had the greatest respect possible) seemed to think the question should be reserved for the next general election. He (Mr. Wright) thought the time was come, now they had a new Parliament, when their grievances should be laid before them in the shape of a Bill of Tenant Rights. He was sure they had got new members who would take the matter up, and some measure would be adopted on purpose to carry out their wishes; and he thought they would be able to satisfy the game preservers, that if they did continue to preserve it, the people of this country would not tolerate it any longer, causing loss to many of the farmers now in the country, and in many instances throwing their families into want. He had no doubt Parliament would pay great attention to their petitions.

After some further discussion, Mr. Robotham agreed to withdraw his amendment till the original motion had been decided upon.

The original motion was then carried with only three dissentients.

The amendment of Mr. Robotham was then put as a substantive motion, and negatived by one vote; but it is only just to say that at that time the meeting had dwindled down to a very small number in consequence of members having to leave for their respective trains.

A vote of thanks to Mr. Osborne, who had taken the chair terminated the proceedings.

INAUGURATION OF THE STATUE OF DAUBENTON.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Less fortunate than Olivier de Serres, Buffon, Mathieu de Dombasle, and Gasparin, the modest Daubenton has long awaited his statue; but he has it at last. On Sunday, Nov. 13th, 1864, in spite of wind and rain, it was inaugurated in the Garden of Acclimatisation, Paris, in the presence of a numerous, but respectable company, proving by their frequent applause that they sympathised in the homage so tardily rendered to that savant.

It is well known that Daubenton, born at Monbard, 1716, was the compatriot, friend, and fellow-labourer of Buffon. He first studied medicine, but afterwards abandoned that science to work and study with the illustrious author of "l'Histoire Naturelle." He furnished to the first 15 vols. of that great work some articles upon anatomy, written with scrupulous exactness. His descriptions are justly regarded even now as true master-pieces, and serve as the bases of comparative anatomy. In 1745 he was appointed guard and conservator to the Cabinet of Natural History, and in 1778 became professor to the College of France. His instructions there were eminently successful. His simple, clear, and precise manner of explaining soon initiated his auditors into

all the secrets of natural history, and he became very popular. He was appointed to succeed the great Cuvier. In 1785 he was nominated professor of rural economy at the School of Alfort. The Academy of Sciences soon opened its doors to him, and he furnished to that august assembly numerous papers, as well as to the *Encyclopédie* of d'Alembert and Diderot, who was a very enthusiastic coadjutor. He died in 1800, in full age, quite obscure, and almost forgotten. Old age is often a first death, physically and morally. His reputation was for an instant effaced by the brilliant glory of Buffon; but posterity is never ungrateful; it assigns to each its place, and renders to those who deserve it their share of immortality.

Daubenton rendered special services to agriculture by acclimatising Spanish merinos in our country (France), and it is chiefly for that reason that his statue is placed in our Zoological Garden. He is represented standing, slightly bending over a sheep which he is caressing, and surrounded by the implements of husbandry. M. Godin, sculptor of the monument of Annot, erected at Melun, has shown much talent in the rendering of this noble, yet graceful figure.

In the absence of M. Drouyn de Lhuys, the president of the

society, the ceremony was presided over by M. de Quatrefages, professor-conservator of the Museum of Natural History, member of the Institute, and vice-president of the Acclimatization Society.

A tent of brilliant colours was erected in the Garden. The members of the council first took their places upon the platform, then Messrs. A. Passy and Rnfz de Lavison. In answer to the applause of the crowd, the cloths which covered the statue were removed. The band of the Guard of Paris played, after which the choir of the children of Lut'ce struck up the Song of the Labourers and the Shepherd's Song, those remarkable productions of Laurent de Rillé. M. Quatrefages then rose, and delivered the following speech:—

"Gentlemen,—Returning after a long absence and very important occupations, I find myself quite unprepared for the honour put upon me—that of presiding over this ceremony. You are aware that his Excellency M. Drouyn de Lhuys, being detained by most important duties, is unable to take his part on this occasion, which crowns the whole of the proceedings in which your president has had so large a share. I regret his absence, both on your account and my own, for by it we lose one of those addresses, so full of life and heart, to which we are accustomed, and which certainly cannot be replaced by my unmeditated words.

"Daubenton you know was the compatriot, fellow-labourer, and friend of Buffon. An equal love of science, and a similar ardour to sound the mysteries of nature, were the bonds which united these two men, so different in most respects—a union which for many long years was devoted to the service of genius. Sometimes too bold, but having an exact mind—patient, conscientious—he was determined to seek and find those precise facts without which the most apparently beautiful conceptions are only too often worse than useless.

"In that association, the functions of which he filled at the Jardin du Roi, now the Museum, Daubenton accepted a most subordinate post. Far from complaining, he seemed pleased with a position that, whilst it shielded him from notice, placed in his hands many scientific treasures; but the work brought him to the light which soon struck every eye, and honours quickly came to seek the modest 'démonstrateur du cabinet d'histoire naturelle.'

"The Academy of Sciences also soon enlisted him into its ranks. They were justified in choosing him by the part Daubenton had taken in Buffon's work, and still further by a series of important papers written by him upon pure science. After a while, the desire to be useful induced Daubenton to engage

in another order of researches. He endeavoured, by applying himself to the study of physiology, to discover the means of acclimatizing better races of foreign domestic animals, with a view to improving our indigenous breeds; and the same hand which had assisted in sounding the depths of comparative anatomy wrote 'Instruction pour les Bergers; et le Mémoire sur le premier drap de laine superfin du cru de la France.'*

"These works of so varied a character give to the historical figure of Daubenton a double physiognomy. First, we have in him the savant, properly so called—eminent, no doubt, amongst his contemporaries, but whose glory paled a little by the reflection of the halo which spread around the name of Buffon. Then we have the savant who applies science to public benefit, and takes under that title an elevated position apart from others. Contemporaries themselves understood that they had there, so to speak, two men in one, and knew how to honour both. For the first they appointed him to the chair of natural history at the College of France; for the second he was chosen by the School of Alfort as professor of rural economy.

"And now, gentlemen, we in our turn pay to the latter a solemn and well-merited homage. As the representatives of posterity, we to-day sanction the judgment held by our fathers. Far be it from me to establish a comparison in every respect—that would be impossible; but when pure science has nobly acquitted its debt towards one of its most glorious representatives, by placing the statue of Buffon in the Jardin des Plantes, it is natural that applied science should pay hers by raising the statue of Daubenton in the Jardin d'Acclimatization. The thought which originated in the bosom of our society, stated by our honourable vice-president Richard, is at last realised, thanks to your concurrence, gentlemen, as well as that of numerous contemporaries who have assisted in our work: let us congratulate ourselves upon the result.

"It proves at once that in France no true merit can pass away unacknowledged, and that everyone who devotes himself seriously to the service of his country or humanity will sooner or later receive a just reward."

M. Richard (of Cantal) and M. Viard, mayor of Montbard, the country of both Daubenton and Buffon, afterwards spoke in honour of the man who had done so much good by the introduction of the race of merinos into France.

We like to give verbatim the whole proceedings of such ceremonies, and show that we never forget those who during their lives render services to their country and humanity.

GEORGE BARRAL.

OUR CATTLE ECONOMY.

OUR FOREIGN CATTLE TRADE.

Speaking in the mildest terms applicable to the occasion, our trade in foreign cattle is anything but creditable to the country. The home trade is bad enough—sufficient to make an intelligent agricultural public blush; but the traffic between England and the continent of Europe in live stock is many degrees more reprehensible; and what makes it all the more to be regretted is the fact that its objectionable features are daily increasing in number and magnitude, faster than the means used to effect a change to the better; so that, generally speaking, the trade is moving from bad to worse. We are all familiar with the "Dog Days," and the changes that take place in the blood of hunted and affrighted animals, but sadly neglect the practical lesson which they teach, in reference to the marketing of our cattle; for if the canine race and hunted and affrighted animals suffer so much from the extremes of summer-heat and nervous and other excitement, it is but reasonable to suppose that similar causes acting upon fat stock and milch cows is by no means favourable to health during the hardships they experience in marketing; nevertheless British capital has but one rule for all temperatures, the management of stock during summer, winter, and autumn being upon a par. Happily, the fat-stock trade is fast being superseded by the carcase trade, and the growing prevalence of contagious diseases is rapidly affecting the transition which is thus taking place; for, with all the short-comings that are yet experienced in the conveyance of

carcases by rail and sea, they fall infinitely short of those felt under the live-stock trade.

What reason has hitherto failed to do, the cattle-plague promises soon to effect. A very large proportion of the fat stock sold in the Metropolitan Cattle Market is bought by intermediate jobbers or middle-men, for the carcase trade and the country. It is hardly possible to imagine a system more calculated to generate and spread contagious diseases like the various kinds of murrain. To this head of the subject we shall return when discussing the character of the cattle plague, and the means of its spread and prevention; meantime we shall only toss to the winds the fallacious notion now being crammed down the throats of a too credulous public, that the embarking ports of the continent of Europe are free from cattle plague; for how could diseased cattle and disease-carrying things pass through a country without spreading the contagion far and wide? Supposing the state of both atmospheres equal, the contagion has had more time to spread at the embarking ports than at the disembarking ports, and without fear of contradiction we do not hesitate to affirm that the facts of the case will bear out the soundness of this conclusion. But to return to the middlemen

* "Instructions to Shepherds; and Memoir on the first cloth made from superfine wool grown in France."

jobbers for the carcase trade—the prevalence of contagious diseases is proving a windfall to them in the outset; but, like the plague itself, it will eventually prove the contrary; and if railway companies and steam-boat companies would improve their methods of conveying carcases, there would soon be an end of fat-stock markets altogether. Moreover, improvements like those in question ought to be enforced by statutory means, if they cannot be effected otherwise by professional skill and enterprise; for the time has obviously arrived when the work of progress must be commenced, and prosecuted in a manner becoming the age and the occasion.

We dislike statutory interference in questions of progress in the march of any branch of physical science; but as "there are exceptions to all rules," it certainly would not be beyond the urgent demands of the question at issue were the Legislature to prohibit the importation of live stock from the continent of Europe in the sailing-vessels and steam-boats now employed for that purpose; and the same or a similar rule might be judiciously applied to the sea conveyance of cattle generally, and suitable premiums offered in both cases for the efficient conveyance of carcases. In other words, the statutory prohibition would extend to all vessels not built and fitted up expressly for the sea conveyance of cattle *in stormy weather*, all such vessels being duly registered and licensed for this purpose, and under a properly organized staff of control and management. Improvement in the conveyance of carcases ought also to be enforced. Moreover, some such statutory means are at the present time necessary, to justify the investment of capital in an enterprise of this kind; for so long as the present system is tolerated, short-sighted and unprincipled dealers in live and dead stock would, or rather will, be induced, by "peuny wise and pound foolish" calculations, to continue their present practice of shipping live stock, carcases, &c., thereby keeping both the buying and selling markets in a foul, contagious, and unsettled state.

But apart from such statutory means, and the force of a barbarous practice with which those engaged in it have become naturalized, so to speak, there is (confining our remarks to the live-stock trade) already an open and inviting field for the safe investment of capital under an enlightened and judicious system of management—the field of enterprise being of sufficient length and breadth to guarantee an increasing and remunerating trade, for vessels could be so constructed as to carry either live stock or carcases. We here allude more especially to the shipment of the better class of stock, which is able to pay a somewhat higher fare than the present charge, provided they are shipped in a proper condition, and yet leave their owners the gainers in the end. The rag-tag description of stock is but a losing lottery at the best—the least of two evils as a sacrifice of necessity, that the continental farmer, like the home farmer must submit to; thankfully pocketing the proceeds, however small, as better than no returns at all, or next to nothing, at home. All such riff-raff ought to be wholly excluded from the English markets, so that were they once virtually separated from the healthy thriving and better class of animals by those wholesome laws of commerce that regulate trade, the shippers of such cargoes, and also the owners of the vessels carrying such cargoes, would both find it a waning and losing concern. The owners of such craft, whether sailing vessels or steamers, may struggle on, and even fight for a hopeless and miserable existence, so long as they can keep their craft afloat; but this old system, like all other antiquated systems, would fast die out in many individual cases prematurely, for all new vessels would be built upon the most improved plan, overcrowding being prohibited. In short, the enterprise only requires to be fairly started on a scientific basis, according to the requirements of cattle, in order to carry successfully with it the whole of the import trade in cattle in the march of improvement; for it would be the height of commercial absurdity to suppose the contrary—that continental farmers and cattle dealers would continue to submit to the present sacrifices in order to uphold an antiquated sea-faring craft, were they in possession of the improved system of shipping in question, so as to obviate the heavy losses they now experience—losses that have hitherto been annually increasing in amount, and which, at the present time, are so ruinous as to threaten the extermination of the trade altogether.

These observations apply to the shipment of Scotch and Irish cattle, as well as to the import of stock from the continent of Europe. Improved cattle-steamers from the north,

including a more scientific system of management, would no doubt have to compete with improved methods of railway conveyance, and the rapidly-increasing demands of the carcase trade; but from the sister-country, Ireland, which is naturally a cattle-growing country, and which ought to supply the English market with a greatly increased amount of live-stock, more especially neat cattle, there would be a regular and increasing import trade. The proposition of growing beef for the English market may not as yet be a very popular one in the Irish ear, generally speaking; but it is high time, and, in point of fact, the more intelligent Irish farmers are already beginning to look to their own pockets as the true index to the course of action which they should professionally follow. If they can get a higher price in the Irish markets for their beef, then let Irishmen consume it at home; but if they can realize more in the English market, then let the pecuniary balance decide the practical question at issue. When seen in its own light, the solution of the question is about as simple on the one side of St. George's Channel as the other. Hence the practical conclusion at which the farmers of the sister-country are now fast arriving. Hence, also, the stimulus which an improved method of cattle management and shipping, and a higher price for fat stock, would give to the natural and legitimate resources of Irish industry in general, and to Irish agriculture in particular.

In the discussion which is now taking place in the columns of the political press, parties are obviously falling into several practical omissions—omissions no doubt naturally liable to be fallen into, under the peculiar circumstances of the case, but just so much the more necessary to be avoided in the investigation of so important a national question.

First. There is a manifest disposition on the part of those professionally engaged in the foreign cattle trade to overlook, or pass over slightly, if not to conceal as much as possible, the barbarous treatment to which cattle are subject on the continent of Europe before they reach the port of embarkation—to overlook the effect which such treatment produces upon animals, together with the actual position they are in, and how much it unfitts cattle for shipment and the English market.

Second. There is a prominent tendency also to examine from two opposite extremes the progress we have made in shipping cattle—one, the seafaring party, asserting that because their steamers are now built expressly for the purpose of conveying cattle, therefore they erroneously conclude that they are everything that can be desired, both as to the accommodation which they afford to cattle and the management of cattle while at sea; while the opposite party assert with equal zeal and confidence that almost all the injury which foreign cattle sustain is effected on board ship, and in shipping and discharging, the whole seafaring part of the cattle trade being throughout barbarous in the extreme.

Third. The condition in which foreign cattle arrive in England and the treatment they afterwards experience are also viewed in two opposite extremes, the too apparent aim and object of those engaged in the trade (both seller and buyer) being to turn the penny to the best advantage out of the stock, such as they are, without regard to sanitary consequences that lie beyond the immediate routine of the market-day; the greater the number the drover drives, for example, and the salesman sells, the higher their pay, and so on; while those who are getting their fingers occasionally burnt are blowing the trumpet in the opposite extreme, as if the barbarous and antiquated character of the trade was the instrumental cause of all the maladies cattle now experience.

Fourth. We look in vain from beginning to end of the discussion for anything being practically done to determine philosophically what "the two Russian cattle plagues," and the other contagious and deadly maladies introduced from the continent of Europe, really are, and how far they differ from English maladies, with a view chemically to render the infectious poison, home as well foreign, innocuous by means of an antidote. Goats eat some plants that are very poisonous to the generality of animals, without experiencing any harm, because they contain in their system naturally something that acts as an antidote, either by decomposing the poison, or by repelling it along the *primæ viæ* or the other excretories which it may enter. For a similar reason the infectious matter of the steppe murrain is, according to the general testimony, harmless when applied to the pig or horse. Now what is being done to determine the philosophical reason why? Obviously nothing.

On the contrary, is not the very reverse of this old established scientific rule the practice which medical men and veterinarians are doing their best to follow, as if curing maladies and not preventing them were their exclusive profession?

A very short practical *exposé* of these four shortcomings is all that is necessary. If those professionally engaged in the foreign cattle trade cannot supply the English market with healthy animals and wholesome meat, the sooner they are keeled across both buttocks and their places supplied with nationally trustworthy, intelligent, qualified persons, the better; and this applies with greater force to the English portion of the trade than to the foreign department of it. The facts of the case at the present time are so glaring and unpardonable as to exclude either from offering a single sentence in justification of their conduct, shipper or buyer.

Irish agriculturists and the French government are right. "Desperate diseases require desperate cures" it is said, and the indescribable state of the abnormal condition of the foreign cattle trade at present imperatively demands that the whole trade be made to ride a testing quarantine some way or other, until it has completely recovered, and is again in a position to supply the English market with none but healthy animals. The moment that contagious diseases, such as the cattle plague, are imported into England and appear in the English market, that moment the foreign trade in cattle should be prohibited altogether for a time, until disease has exhausted itself on the continent of Europe. The loss to those engaged in the trade, English and foreign, would no doubt be heavy and ruinous to not a few. But is not this what the foreign cattle trade justly merits? and, we may add, the only remedy adequate to effect a cure and establish permanently a healthy state of the trade. Upon the whole England would be a gainer, for the loss the English farmer has sustained is incalculably great. As to a supply of animal food for the English market, to this subject we shall return under a different heading, viz., "Foreign Carcase Trade;" meantime we would purposely avoid uncharitable reflections towards the continental stock farmer and his representatives in the live stock trade; but the fact to which we allude, viz., the heavy losses of the English farmer and public generally cannot be concealed as being so many gains to them, for the immense reduction of the home supply of meat is greatly increasing the demand for and trade in foreign stock, so that those engaged in the latter, the foreign trade, have an interest in the losses of the English farmer. And this too is not all, for there are a certain class of officials who have a professional interest in propagating disease, for the greater its amount the more employment and pay they receive. Is this as it should be? What can be more ridiculously and even culpably absurd than the manner stock are now being examined and passed by veterinarians at the embarking and disembarking ports? Equally absurd and culpable is the breathing space afforded to stock on board steamers, without any regard to their individual requirements from the peculiar state they are in. "This lot must be passed as healthy, and can be shipped at so much per head; and so must that lot, and the next following;" and thus the objectionable elements of an abnormal trade work together for the ruin of the English farmer and the general loss of the English public. So long as the old cuckoo song rings in the ears of Dutch and Russian boors, that "*anything will sell in the London market*," and so long as all sorts of live trash is weekly sold in the London market, what else can the English farmer and the English public expect but the importation of the maladies to which such a species of stock are naturally liable? for it may not inaptly be said that the cause of their rag-tag condition is the lurking of the seeds of disease in their system—life struggling in vain for the mastery over an incipient poison, as it were.

HOME CATTLE TRADE.

There is no department of farm practice that has been allowed to fall so far behind, in the march of improvement, as the marketing of live stock, more especially fat cattle and milch cows. All practices are said to be subject to improvement, and there are very few branches of industry that have not made numerous advances during the currency of the present century. We are, however, every day reminded that there are exceptions to all general rules, and the commerce of cattle is evidently one, for it is in a less advanced state to-day than

it was in a hundred years ago, both as to the health of cattle and the quality of the carcase.

It is easily accounting for this retrograde movement in the commerce of cattle, when the facts of the case are closely examined from a sanitary and practical point of view. Thus, although live stock of every kind are more uniformly and better kept throughout the year, and although breeds are greatly improved as to early maturity, symmetry, and carcase weight, animals are nevertheless more delicate in constitution, and much less able to bear the hardships of marketing, than formerly, when they were not only older, but in the enjoyment of a higher degree of that "rude health," as it is termed, so essentially necessary to their conveyance, whether by road, rail, or sea; for animals in the enjoyment of this "rude health" are invariably ready for their food, whereas our modern oilcake-pampered and extra-fat cattle are almost always "off feet" during the long course of hardships they have to experience when sent to a market at a distance from home. In the olden time, when broad grassy road-sides and numerous commons and baiting grounds everywhere abounded, it was no unfrequent thing for a skilful drover to deliver his stock, in a distant market, in better condition than when they left their native grazing grounds. Under good management, hardy Scotch lean and half-fat stock used to generally improve in coming up from the far north to the English markets. The feet of cattle grow tougher and harder as they grow older, hence the feet of old cattle are better able to support the weight of the body than those of young beasts forced forward to early maturity. Exactly the same thing may be said of their bones, joints, and tissues. At present the reverse of all this is the case, for commons are enclosed, baiting grounds are annually getting farther and farther between, roads are getting narrower and harder, while the feet, bones, and joints of cattle are softer and less able to bear their weight, which latter (*weight*) has at the same time greatly increased. Hence the practical conclusion. The surprise is that our modern improved breeds of cattle, both oxen and sheep, are able to bear up under the hardships they are called upon to endure; for although railroads and steamboats convey them a distance in less time, yet the length of time during which they have to stand upon their feet without being allowed to lie down, rest, and recruit their exhausted strength, is far greater than formerly. Add to the above the greater number of markets, and cattle collected together, and the finale is conclusive.

The changes which have thus taken place in the conveyance and marketing of cattle increase the liability to generate diseases of a typhoid character, and to spread contagious diseases of every kind, especially rinderpest or steppe-murrain, and the like, whose contagious fomites are given off from the lungs, skins, &c., of animals labouring under such diseases, and are carried from one victim to another suspended in the atmosphere. As we propose offering a few practical observations on those contagious maladies in a separate paper, we shall not speak more of them here, further than to say that the generation of miasm and contagion, and their buoyancy, malignant character, and spread, are manifestly subject to the same physical laws as all other gaseous matters of a kindred character are; and, consequently, that the force and effect of contagion must always be directly as the crowded state, relaxed and prostrate vitality, so to speak, and delicate constitutional health and tone of nerve generally of cattle; but inversely as the cattle are single and enjoy free air, an active robust vitality, with an overflowing redundancy of "rude health." For, in the former case, there exists between the bodies of animals and the contagious matter in the atmosphere, or in any other medium by which it is carried, an attractive force; whereas, in the latter case, the force that exists between the bodies of robust healthy cattle and the contagious matter is, we aver, of a repulsive character. Hence the difference.

Such being the facts of the case relative to the peculiar position of trade, it is natural for butchers who are guided by experience to increase their weekly demands upon the dead-meat market, and to reduce their live-stock purchases. At a time like the present, when cattle-plague and sheep-pox prevail and are spreading to an alarming extent, and when the provinces are in a state of excited convulsion, butchers who can get a daily supply from the dead-meat market to meet the daily demands of their customers would be blind to their best interests were they to purchase only once a week, and thus keep a stock of fat beasts on hand when dairy cows on every

hand are labouring under plague, the atmosphere being literally a putrid sea of pestilence. According to the laws and economy of commerce, it is the seller who must run and bear the risk of the heavy losses which the keeping of a stock of fat beasts on hand involves under the peculiar circumstances of the case. Hence the reason why farmers are not pocketing the long prices now paid by consumers for their beef and mutton—a large double-risk profit, so to speak, or the difference in question being pocketed by the middle-men jobbers, who purchase and slaughter for the carcase trade—a craft whose purchases of live-stock and sales of dead meat are increasing with the prevalence of disease amongst dairy cows, as well as amongst fat stock.

The above observations apply with equal force to home and foreign cattle, a very large proportion of both sent to the metropolitan market being bought by a middle-class system of jobbing for the carcase trade, and a very disreputable system of jobbing it is. It is not to be inferred from this that we are indirectly saying that either cattle salesmen or carcase salesmen, or the middle-men jobbers that fill up the commercial gap between, are dishonest in their transactions, nor do we even insinuate that they are a class of men that are over-well paid or that require sharp looking after. People have a right to live by their profession, whatever it may be, and we aver that the profits of the middle-men jobbers in question are not greater than the precarious nature of their trade and the heavy risks attending it demand. What we simply wish the reader to understand is that the middle-class jobbing system should not exist at all, for if livestock salesmen cannot dispose of the farmers' fat stock to butchers, the obvious interest of the farmer is to slaughter his fat cattle at home, and forward the carcasses to a dead-meat salesman, and thus save the extra expense attending the marketing of live-stock, including the charges of the live-stock salesmen, and the extra profits of the middle jobbers, &c.

The reader will thus perceive that it cannot be said our cattle trade is in a very healthy state, in more respects than one. It will also be seen that the commercial malady is of a character that must eventually work its own cure, or rather we should say is fast curing itself; for the supplies of dead meat sent to the capital, and to all our other large towns, is annually increasing more and more rapidly, and the growing prevalence of contagious diseases is adding fresh speed to the accelerated velocity of the commercial change which is thus taking place, as already stated.

Besides the middle-class jobbing there is another feature of our fat-stock markets, which is of itself sufficient to effect the change from the live-stock to the dead-meat trade. We allude to the rapidly-increasing demands upon weekly markets, and the manner they are fast overgrowing the possibility of supplies to meet the requirements of consumers. The daily demands of the latter (consumers), according to the economy of commerce, for example, require daily supplies, to meet which daily live-stock markets are for a similar reason essentially necessary; otherwise, a general loss must inevitably be sustained by the producer, viz., the farmer—a loss which he in more enlightened times will unquestionably learn to save; for, with the growing prevalence of contagious diseases, the magnitude of this loss is becoming something incredible.

At the present time, when the cattle plague is giving rise to so much alarm, the gathering and collecting together of stock (home and foreign) for the Monday market of the metropolis, for example, with the increasing and rapid development of disease that is taking place, involves matter that merits timely consideration of the Government and general public. As a matter of course the City Corporation with its markets' committee are up in a buzz as usual; but their conduct practically considered more resembles that of blue-bottle flies when the heat and stink become intolerant, than the judgment of men qualified to grapple successfully with the cattle trade of the capital. Had they got their own way, the thousands of cattle that congregate weekly from all quarters of the United Kingdom and the continent of Europe would have, to this day, been reeking and seething in sulfocation in old Smithfield! and when the country compelled them to make a change, what could be expected but the construction of a cattle market long out of date before it was opened. We have Divine authority for saying that "Mankind are prone to do what they ought not to do, and to leave undone those things which they ought to do;" and the moral thus taught with so much truth-

fulness may be justly applied to the movements of the corporation of London relative to the cattle plague; for everything they have done has up to this date added to the spread of disease. Had they proposed a daily market during the "dog days," we should then have given them credit to this extent for their earnest endeavours to go-a-head in the march of improvement; but we have looked in vain for any motion in this direction.

The Egyptian Government has just traced the source of cholera to the putrid offal of the million of animals slaughtered in sacrifice during the festivals in the Mahomedan pilgrimages; but, in spite of the practical lesson thus read the British capital, relative to the concentration of putrid animal and vegetable effluvia, and to the contagious consequences that follow, what have our civic authorities done?

It would be an easy matter to prove that all the doings of the corporation of London, in reference to contagious cattle diseases, have had for their ultimate effect the concentration of disease-breeding and plague-attracting elements, so as to increase the force and effect of contagion as it were, and its rapid spread throughout town and country! It were difficult to imagine any line of conduct more wayward and adverse to duty and the requirements of the general public. One practical conclusion naturally suggests itself—viz., that a daily market would unquestionably greatly tend to lessen the predisposing cause of contagion, and also the generation and spread of steppe-murraim and all similar contagious diseases amongst cattle during the heat of summer.

Farmers are proverbially fond of a pecuniary view of things, and at the present time there is a golden difference between the producers' prices and the consumers' prices of butcher-meat that merits a searching investigation. A few butchers and cattle salesmen may well evince an anxious desire to uphold the present system, if system it can be called, and to take alarm at any proposition which threatens practically to interfere with the difference in question, such as prohibiting the importation of foreign fat stock, and the doing away with the intermediate jobbing which such would involve, well knowing that the ultimatum would be the establishment of a foreign carcase trade upon a permanent foundation. It will no doubt be said, as we have oftener than once been told by several of those butchers and salesmen now taking an active and prominent part in all discussions on the subject, "That but for the middle-class jobbers, who buy in the live-stock market for the carcase trade, the producers' price would be less than what it is." Granted, of course. But this concession is not saying much for the producer's representative in the metropolitan market, and, if possible, less for those to whom he sells his live-stock consignments, whether they be top-men or middle-men; for it is only telling the simple farmer that, but for the existence of what we have shown to be a bad system, things would be worse than they are! In other words, the difference between the producer's price and consumer's price would be greater than what it is were there no middle-men purchasers for the carcase trade! The ultimatum—one which is fast working its own way onwards in the march of improvement—is to split this difference so as to put the first half into the producer's pocket, leaving the second half in that of the consumer's. And there is much more than this in favour of both producer and consumer, for at present the reduction of weight and quality of meat during live-stock marketing is incredible; so that to half the difference thus gained and saved there must be added an increase of weight to the former, and an increase of quality to the latter, which is just so much more money gained and saved by them. The butchers and live-stock salesmen of the metropolis may talk fluently of their "experience," and so forth. But what is its real value, practically speaking? "Experience" is an old hobby-horse which butchers, and not a few old-school farmers, have long ridden to death; for the carcase trade is increasing while the live-stock trade is decreasing, so that the actual experimental conclusion is too manifest to permit of being formally deduced from the facts of the case experienced on both sides. Is it not high time for practical men, such as farmers, salesmen, and butchers, to give over propping up opinionative tenets by antiquated systems that are fast falling about their ears? Doubtless the carcase trade as it exists is unsuited for the farmer, home and foreign; but that is no reason why it should be so, against either. The carcase trade we shall discuss in our next paper. Meanwhile we again

commend farmers to examine the whole subject more closely from a pecuniary point of view than is now being done. True enough the reports of the metropolitan markets that appear weekly in the *Mark Lane Express* show the live-stock sales to be higher per stone of 5lbs. than the carcass sales; but are we to understand from this that the middle-men jobbers, whose trade is fast increasing, purchase in the live-stock market to

lose money in the dead-meat market? It may be said that the golden difference lies in the offal! But is not this only jumping out of the frying-pan into the fire? In short, we must confess our inability to reconcile the facts of the case, when closely followed up from the one market to the other, with the interest of the farmer and the public.

A FIRST-PRIZE STOCK BREEDER.

ON THE CATTLE DISEASE.—ITS ORIGIN, PREVENTION, AND CURE.

A life of upwards of sixty years' duration, in the first part of which I was trained as a merchant (in London), which profession I afterwards pursued abroad, and a twenty-five years' practice in agriculture and administrative economy in Russia, enable me to give an opinion on this important subject, which I trust may be of some use to my readers.

On my return to England in 1863, after a residence abroad of upwards of thirty-five years, I was so struck by many defects still existing in the management of sheep and cattle, that I addressed myself to the secretary of the Royal Agricultural Society of England, and proposed to communicate what experience I had gained abroad to the British public, through the *Journal* of the Society. The result was, firstly, that a communication made by me in July 1864, confirming Professor Simonds' opinion as to the necessity for, and the advantage of inoculating sheep for the small-pox, "*which had been practised under my direction in Russia for a period of upwards of twenty-five years*," was published in the *Journal* of the Royal Agricultural Society. Secondly, seeing the defective mode of treating cattle in general, and milch cows in particular, in town dairies, I anticipated imminent danger, and therefore wrote a long paper in illustration of the question, giving my views of the subject, and pointing out the urgent necessity for taking measures to bring about a more satisfactory state of things.

My paper was returned, with the remark that it was considered that my observations were not appropriate at that time, although "if your paper was reduced in bulk it would very likely be acceptable to any of our agricultural newspapers."

As it was never published, and present events prove the correctness of my views, I consider it my duty to publish its contents in a condensed form for the benefit of those amongst whom I propose to pass my last days; that will form the contents of this communication. The paper above referred to was headed,

DISEASED CATTLE, DISEASED MILK AND MEAT.—A SURE PREVENTION.

After quoting an opinion that "the deaths of cattle from disease are most numerous in dairies," I continue: We have thus undoubted proofs that cattle disease has become an acknowledged fact as *home-bred and general*. The knowledge of the details cited induced me to visit some of the dairies in the vicinity of London, where I found a state of things truly astonishing in this enlightened age.

Not only are all the well-known rules, necessary to be observed in order to secure the interests of all parties, set at defiance, but a system is pursued which is sure to produce both *unwholesome milk and meat*.

It is needless dwelling on facts known to every experienced man, that cows require a much greater volume of fresh air to keep them in a healthy state than any other animal; and that salt is as necessary to them as it is to a human being.

We find, however, that the present rule is to keep the cows as warm as possible, without reference to the vitiated state of the atmosphere, which I have found *poisonous*, because they fatten sooner for the butcher when kept warm, and that salt is but seldom given: animals in the last stage of disease are found in the same shed with sound cows.

Lord Somerville, J. C. Curran, Esq., and others have written so much on the necessity and the advantages derived from the use of salt for animals, that one would think that it is needless to write more on that most important subject.

I have been witness that the immense supplies of tallow produced from Russia never could be produced without an abun-

dant supply of salt given to the animals when grazing. The Russian cattle-dealers, to whom I let annually some thousand acres of steppe pasture-ground, *invariably employ it*.

The immense flocks of Merino sheep pastured in Russia have their weekly supply of salt as regularly as the labourers on the farms.

I trust that the above facts will tend to confirm the many authorities which have preceded me in their judgment that it is to the interest of all cattle-dealers to ensure to their stock plenty of fresh air and a sufficient supply of salt; also to convince dairymen in particular that by doing so they will have the following advantages:

1. They will obtain more and better milk from their cows than they do by following their present system.
2. The cows will be much less subject to disease than hitherto.
3. A cow will remain in milk a longer time when supplied with salt than without it.
4. All animals will fatten at less cost when salt is given them than without it.

I consider that the following rules may be laid down as indispensable, in order to ensure the desired results:

That in all dairies situated within twenty miles of London, or any town, salt must be given to cows every other day, not less in quantity than four ounces to each: to cattle fattening three ounces daily*.

That all sheds in which cows are kept, while having regard to a necessary degree of warmth, be properly ventilated, by having the doors and shutters, or windows, open the greater part of the day and night, *not closed as they now mostly are, thereby compelling the animals to breathe impure air*.

When many cows are kept in one shed, no boarded partitions to be allowed to form stalls. Or otherwise, when necessary to make stalls, then posts and rails to be employed alone for that purpose.

If more than fifty cows are kept in one shed, then their heads to be placed inwards, or towards the centre of the building, where on a raised platform their fodder may be given; thus ensuring great care and cleanliness, for it is always under inspection, when you visit the cows; at the same time a free current of fresh air is secured to them by opening the doors at the ends, or sides of the building.

I have found this last named plan of immense advantage in every respect.

I have no hesitation in affirming that the strict observation of these simple rules (and the usual rules of cleanliness being observed) would remedy much of the existing evils, *which I cannot but think proceed more from causes of our own creation than from contact with diseased cattle imported from abroad, or from the sister-kingdom*.

It is well known how difficult it is to overcome 'prejudices and confirmed opinions, and that with agriculturists in particular; therefore it may be necessary to enforce the observation of such rules as it may be advisable to make.

If it were necessary to enact that no ship shall leave Great Britain without being furnished with a proper quantity of acids to be served out to the ship's company at stated times, in order to prevent their having the scurvy, surely it is equally

* The following is a sufficient allowance of salt to Cattle, &c. Cows and fattening cattle, as above. Every other day to young cattle 3 oz., working oxen 4 oz., three-years old 2 oz., calves 1 oz., working horses 4 oz. Sheep 2 oz. per week, given at twice in a trough. In winter it may be given daily to cattle, with chaff, &c.

important to enforce that cattle have fresh air and salt in order to ensure wholesome meat and milk, as well as the prevention of disease in the human frame, caused by poisonous provisions, which are infallibly produced by following the unnatural system generally practised!

JOSIAH DEACON.

Islington, 18th April, 1864.

PREVENTION AND CURE.

I have generally found that the same error has been committed in healing animals as with mankind: *too many drugs are given; and the efforts of nature to effect a cure, instead of being only assisted, are obstructed by the administration of drugs, which are then so many impediments to nature's action.*

This is now so well understood by enlightened professional men, that Dr. Callendar in addressing the students (as usual) previous to the commencement of this year's course of lectures at St. Bartholemew's Hospital, London, used these words "Students should learn to recognise means of cure other than those tabulated in the Pharmacopœia—fresh air, diet, &c. * ** *They should never forget that nature effects, if possible, a cure.*"

The above remarks, in my opinion, apply to murrain and all diseases of that nature in particular; I therefore founded my successful mode of treating them *on the plan of only checking any evil influence, leaving to nature to do the rest!*

Every one who has studied the course of murrain agrees, that one of its most striking features, next to a state of fever, which last bleeding does not relieve, is the state of the stomachs of the diseased animal. Undigested and hardened food, often matter in a state of fermentation, is found in the paunch, which is distended with wind; in the third stomach sometimes hard strong lumps of food are found, sometimes a quantity of food in a high state of fermentation; the fourth stomach is often empty, sometimes contains fermented food in a state of decomposition. As in all diseases of this character, it is evident that *great acidity has prevailed, which is invariably succeeded by purging*, more or less violently, according to the character the disease assumes.

Prevention.—The usual rules being observed of cleanliness, proper shelter from cold and wet, both which last are indispensable, and strict attention paid to their having abundance of fresh air, and a regular supply of salt, as indicated in my former paper on the cattle disease, these usually suffice to preserve cattle and sheep in good health. Much, though, sometimes depends on the mode of feeding them; that branch of the subject I must leave for a future occasion.

When necessary to take other precautionary measures of preservation from disease, the plan I adopted was this: As soon as I found that inflammatory disease prevailed within the distance of about 100 miles of our place, or as soon as I observed the cattle beginning to suffer from atmospheric influences or drought, I ordered to be given to them every other day, early in the morning, diluted sulphuric acid (vitriol) and water. It was given to them by dropping the acid from a bottle into a trough filled with water, where the cattle were usually watered, stirring it all the time with a stick, and dropping the acid the whole length of the trough, in order that it might be equally distributed in the water.

It is not necessary to observe any fixed proportionate quantity of vitriol and water, for a little more or less acid is of no consequence; but the rule to be observed is, that the water is to be only *slightly acid*, so as to feel the effects on your teeth when tasting it. When administered the effect on the cattle was really often wonderful; offering convincing proof of its efficacy to the Russian peasants, who always asked for its administration when disease prevailed yet far off. From drooping, sickly animals, rejecting their food, they became lively and took well to their food again, and seemed as it were to gain new life, which carried them through a most trying period when thousands of cattle not treated in that way perished.

As long as disease prevailed in my neighbourhood the acid was given as above described. When disease did not prevail near to us (or in the total absence of disease, the weather improved) the acid was given after the first week or two only twice a week, and gradually abandoned. I found the same advantage from it in excessively dry seasons, in checking the tendency to inflammatory action in sheep.

My cattle also escaped attacks of pleuro-pneumonia, or lung

disease, while my neighbours suffered great loss of cattle from that complaint.

Cure.—The disease taken in its earliest stage has always yielded to the following mode of treatment. I never had occasion to try from cattle which had suffered any length of time, for during nearly twenty years I found the mode of prevention advised above, so certain, that I really had no opportunity of applying it to any great extent. I must state that the property under my administration was very great, and we were far removed from neighbours; moreover it is impossible in such a country as Russia to try any new method, unless it be under your own immediate inspection, with the remotest chance of arriving at a true result. As soon as the first symptoms of the murrain manifested itself (or even in case of dysentery) I gave a purgative, for a full grown ox or cow, of not less than three-quarters of a pint of hemp oil; after allowing an hour or two to elapse, after the animal had purged, I gave a dose of about two quarts of lime water, and shortly after a good clyster of the same. These two last were both repeated at intervals of about an hour, until the discharge from the animal began to assume a healthy appearance, free from its usual noxious smell on such occasions.

If after the lapse of a few hours the purging continued as before, not being sufficiently changed and subdued by the lime water, I then considered that the stomachs were not sufficiently evacuated of offensive matter; and gave half a pint of oil, which usually produced a copious discharge of hardened and putrid matter; after which a clyster and a draught of lime water sufficed to restore the discharge to a healthy state.

I then allowed the animal a few hours of repose, unless very feverish symptoms were present, in which case I gave every hour about a pint of water made acid with sulphuric acid, as already described. If there were not any feverish symptoms then, I gave the above named dose of acidulated water morning and evening, or allowed the animal to drink the acid water twice a day until restored to health.

After the lapse of about half a day, when the above described mode of treatment had been practised, I gave some gruel made with oatmeal, and one or two injections of the same. In a few days it was changed for barley-meal, and finally for a mash of cut hay and meal, well scalded or steamed, taking care that sufficient salt was mixed with all the above, as the best tonic that can be given.

If any tendency to purging showed itself later, the lime-water clysters only were renewed; but if that did not check it, the lime-water draught in diminished quantity was again given.

I may here remark that almost any oil may serve the purpose as a purgative; and that in very many cases which came to my knowledge and under my observation, bleeding never aided to effect a cure, but was highly injurious.

The rationale of this mode of treatment is, by a powerful dose of a medicine which is the least trying of any to a weakened stomach and system (and has the advantage of being emollient), to evacuate the stomach at once of the principal causes of continued disease; then, by means of lime-water clysters and draughts, counteract all acidity and tendency to putridity, and to strengthen, leaving the rest for nature to perform. I consider that it may be better, if the animal refused to drink the acidulated water (which acts as a tonic), and prefers, on trial, cold water, not to force the acid water on it after a few doses of it have been given.

The lime-water may be prepared as usual, or chloride of lime may be employed in the proportion of one drachm of chloride of lime in one quart of water, which may be sufficient for a draught.

The usual precautions of separating the sick cattle from the sound are of course to be strictly observed; and, in case of death, it is indispensable that the whole carcase, skin and all, be buried in quick-lime; for it has been often proved that murrain has been spread by means of the raw hides carried into a district where not a trace of it previously existed.

All wood-work, walls, and the ground where diseased cattle had stood must be washed several times with strong lime-water, and the dung removed and burnt. Sound cattle should not be placed in such places until after the lapse of several months.

I strongly advise the use of clysters of lime-water, or even tepid pure water, in all cases of purging, for I consider their important action is too little understood or observed. In order to show the immense advantage of clysters, I may cite the au-

thority of Dr. James Irving, of the Bengal army, who was very successful in curing dysentery in the human being, as follows, after all other means tried had failed:

Warm water, or milk-and-water at ninety degrees of temperature was employed for an adult, from three to six pints at

a time, and reduced in quantity according to age. The mode of proceeding was, to lay the patient on his back, introduce a tube in the rectum nine inches long, and inject by means of a pump.

Halifax, N.S., Sept. 22, 1865.

JOSIAH DEACON.

THE RECENTLY-DISCOVERED PHOSPHATIC DEPOSITS IN NORTH WALES.

BY DR. VOELCKER.

[Read at the Meeting of the British Association at Birmingham.]

The discovery of new supplies of phosphatic materials, it is scarcely necessary for me to say, is of the highest importance to the English agriculturist, who, in the shape of superphosphate and similar artificial manures, consumes annually many thousand tons of phosphatic fertilizers, the demand for which is yearly increasing, not only in this country, but on the continent and in the colonies.

Under these circumstances, it is fortunate that, from time to time, fresh mineral deposits are discovered, and others are made available for manufacturing purposes, which previously were known only as objects of interest to the geologist or mineralogist.

Those engaged in the manufacture of artificial manures, or of phosphorus, are well acquainted with the fact that bones, South American boneash, Cambridgeshire and Suffolk coprolites, apatite from Canada, phosphorite from Spain, Sombbrero rock-guano, phosphatic guanos from the South Pacific Ocean, and other varieties of mineral phosphates, find a ready sale, and are largely consumed by manufacturers of manures in this country.

Apprehension has indeed been expressed that with the yearly increasing demand for phosphatic manures the supply of the raw materials could not keep pace. Such apprehensions, however, appear to me to have no foundation, for new sources of mineral phosphates are rendered practically available at the present time, which relieve us from any serious apprehension of that sort for many years to come.

The purpose of this paper, however, is not to give an account of the various kinds of phosphatic materials which are found in this country, or imported into it, but to give a brief account of a very extensive mine which has recently been discovered in North Wales. This mine contains, besides copper and iron pyrites, two phosphatic minerals, both of which are of considerable importance to the English agriculturist. One of them is a phosphatic limestone; the other a black shale, largely impregnated with phosphate of lime.

These minerals were discovered recently by Mr. Hope Jones, of Hooton, Cheshire, whilst he was searching for other minerals in the neighbourhood of a place called Cwmgyneu, about 20 miles west of Oswestry. The phosphate deposits occur not far from the clay slate and lead-bearing districts of Llangynog. The rocks are Silurian, of the Llandelo series, and a large fault south of the vein and parallel to it brings in the Denbighshire grits. Cross faults north and south also occur, which are highly metalliferous, containing ores of copper, lead, manganese, &c. The strata (slaty shale) contains several beds of contemporaneous phosphatic ash and scorie; and the usual fossils of the Llandelo series are found, but not in great numbers.

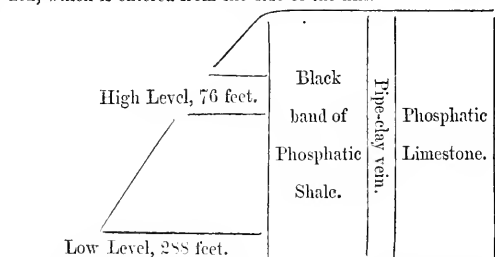
Mr. Hope Jones has traced the phosphatic beds a long distance, and informs me that they are continuous for about two miles. I have myself visited the phosphatic mine at Cwmgyneu, and on that occasion collected various specimens of limestone and black phosphatic shales, to the composition of which I shall presently refer.

The phosphatic minerals, as has already been stated, occur here in clay slate. The slate contains merely traces of phosphoric acid, has a dark colour in some places, and contains, like most clay slates, iron pyrites. The strata of the district are vertical, and the mine is naturally drainable to a depth of about 500 feet. It can be worked economically in galleries, and promises to furnish a very large quantity of phosphatic minerals. A true vein or fissure, containing vein deposit partially metallic, separates the phosphatic limestone from the

black phosphatic shale. The vein and accompanying phosphatic deposits run east and west, or, more correctly speaking, 15 degs. north of west (magnetic).

The black phosphatic slate or band is fully 18 inches thick, and the limestone bed from 8 feet 6 inches to 9 feet. The vein which separates the two deposits from each other is 14 to 16 inches wide, and filled partially with white pipe-clay, calcareous spar, and copper and iron pyrites.

The following diagram is a section of the mine at Cwmgyneu, which is entered from the side of the hill.



The deposits are readily approached by a horizontal passage, which has been driven into the vertical beds of phosphatic minerals. The high level is only 76 feet long, and close to the summit of the hill. The average depth from the summit level to the drainage level is about 500 feet, and the distance here to the phosphatic deposits about 100 yards.

At present the mine is approached only by the summit level; but experience having shown that the black band widens as the depth gets lower, operations have been begun at Cwmgyneu to drive a horizontal passage into the hill at a depth of about 200 feet below the upper level, which is now being driven with as much rapidity as is possible, and will probably be completed in about three months, when a large supply of the phosphatic deposit will be obtainable.

As the depth of the mine has not yet been explored, it is impossible to give a proper estimate of its contents. But as the strata run vertically, and the black band or phosphatic shale gets wider as the depth increases, it may be safely asserted that the mine at Cwmgyneu, extending over more than a mile of ground, contains many hundred thousand, if not millions, of tons of phosphatic deposits.

Having given a description of the locality where the mine occurs, I proceed to offer some observations on the composition of the various minerals which I picked up on the occasion of my visit. I will not tire you by giving you the details of the analyses, which will be published elsewhere, and will only observe that I have made some 10 or 12 complete analyses of the various minerals, and a large number of partial analyses, which I trust will enable me to give you a good idea of the character of these phosphatic deposits.

First, we have the non-phosphatic clay slate, forming the strata of the locality. In most specimens, I found the amount of phosphoric acid too small for quantitative determination; in one specimen, however, I obtained 0.28 of phosphoric acid.

In the next place, we find a bed of black shale, 18 inches in thickness. This shale contains variable quantities of phosphoric acid. Towards the summit of the hill it is not nearly so rich in phosphate of lime as at a lower depth. Thus, in specimen No. 3, taken from a higher level, I find only 24.07 of phosphoric acid, equivalent to 48½ per cent. of tribasic

phosphate of lime; while in another sample, taken at a lower level, I find as much as 29.67 of phosphoric acid, which is equivalent to 04.16 per cent. of phosphate of lime.

The mine at Cwmgynon, as worked at present, produces specimens containing from 54 to 66 per cent. of phosphate of lime. Blocks weighing above 1 cwt., I am informed, are now worked out, which resemble intimately the specimen in which I find 64 per cent. of phosphate of lime.

The black band contains no carbonate of lime, little magnesia, some fluoride of calcium, alumina, and oxide of iron, soluble in dilute acids, and, more or less, iron pyrites. In some specimens I find much less sulphur than in others. The highest percentage of sulphur amounts to 7.02, equivalent to about 13½ per cent. of iron pyrites. The more compact masses, found at a greater depth from the surface, contain less iron pyrites than the deposit nearer to the surface. The occurrence of graphite in this phosphatic shale is also peculiar.

Lastly, we have to take a glance at the composition of the

black limestone beds. The darker-coloured varieties contain more graphite, and are richer in phosphate of lime than the lighter-coloured specimens. In the latter I find only from 10 to 20 per cent. of phosphate of lime; in the darker varieties from 30 to 35 per cent.

The limestone beds contain a good deal of carbonate of magnesia (5 to 8 per cent.). On burning, they furnish a lime which is very valuable for agricultural purposes for the farmer who applies this lime to his land not only supplies it with lime, a constituent required by every description of agricultural produce, but also with the still more important mineral constituent of plants—phosphoric acid. It is scarcely necessary to observe that it is chiefly the phosphoric acid in bones which renders the latter so valuable as a fertilizer; nor need I specially dwell on the fact that the application of this newly-discovered phosphate of lime is, in point of fact, almost equivalent to “liming” and “boning” in one operation.

CULTIVATION AND MANAGEMENT OF THE FLAX PLANT.

BY PROFESSOR HODGES.

In the month of June the fields of Ulster are covered with the blue flowers of a tall and graceful plant, which attracts the attention of every stranger. Towards the end of July the blue flowers fade away, and are replaced by green balls, which gradually assume a golden colour, and glisten in the sun. The commencement of this change in the colour of the capsules of the plant is eagerly watched by the northern farmer, who knows that the time is close at hand for pulling the crop, and submitting it to the various processes which give so much occupation to the people in this part of Ireland. This valued plant of the Ulster farmers is a member of the family termed by botanists *Linacee* (the flaxworts); it is the *Linum usitatissimum* of Linnaeus, and from the earliest ages of the world has afforded a most important textile material. It would be easy to multiply references to the important place occupied by the flax plant in the earliest ages of civilization, both in the ancient seats of industrial knowledge in the East and among the primeval races of Europe. The use of its fibres for the manufacture of linen appears to have prevailed in Egypt from the most ancient times, and the interesting discovery of M. Heer, of Zurich, of the carbonized fruit of the *Linum usitatissimum* in lacustrine establishments of the age of stone, both at Waugen and at Robenhausen, affords us evidence of its early employment in Switzerland. At Waugen, pieces of cord and shreds of tissues of a material resembling flax were discovered in the ancient lake dwellings. It is, however, from Egypt that the most striking proofs, not only of the great antiquity of the culture of the plant, but of the skill which had been acquired in its manufacture, have come down to us. It is not merely that the ancient flax-growers of that country have left, in those remarkable pictorial representations which they placed on the walls of their temples and cemeteries, illustrations of every department of flax management, from the sowing of the seed to the weaving of the fibre; but in the wrappings of their dead they have preserved for our inspection specimens of that “fine linen” to which we have so many allusions in the sacred scriptures, and which, all over the East, has spread the reputation of the looms of ancient Egypt. Some years ago the body of a mummy, which had been presented by Sir James Emerson Tennent to the Museum of the Natural History Society of Belfast, was unrolled, and determined, by the examination of Dr. Hincks, well known as one of the most distinguished Egyptologists of the present day, to be that of the daughter of a courtier or personal friend of Amenemhe IV., the last sovereign but one of the 12th dynasty, who lived about 3,400 years ago. The bandages removed were found of every description of quality, from the “fine linen,” resembling our finest lawn, to a coarse fabric like sack; and as several of the pieces were darned, it was conjectured that all the old linen of the house had been employed in the work. The Egyptian flax of the present day would be unfit to produce the finer qualities; its growth is too rapid under the burning sun. With us, coarser fabrics are made of short broken flax or tow,

but the Egyptian fabrics show no trace of tow yarn. The quality and fineness of the cloth, which was examined by a linen merchant, Mr. John Mulholland, varied from 600 to 2,400. In all the pieces it was remarked that the weft was much finer than the warp, the warp being deficient in quantity to the extent of from a third to a half; and, as usual at the present day, thick threads were inserted at the end of each web to prevent their unravelling. The finer fabrics had a twilled appearance, owing to the weft rising on the surface, from the looms employed not being capable of light weaving. Thus, on the body of a lady who died 500 years before the birth of Homer, who lived, as Sir Emerson Tennent remarked on the occasion of unrolling her remains, when Cærops founded Athens, and before the fall of Nineveh, and who may have stood in the presence of the great Hebrew lawgiver, were found, in every variety of texture, fabrics resembling those in the production of which the spinners of Belfast now occupy the place of the ancient inhabitants of the valley of the Nile. The splendid linen trophy which the merchants of Ulster raised in the hall of the late London Exhibition proved that in this western land a people unknown to the nation over which Amenemhe IV. ruled have succeeded in giving to the produce of the flax a perfection which it probably had never attained in the early home of its manufacture.

The remarkable development of the linen trade of the north of Ireland within the last half-dozen years has probably at the present, more than any previous time, directed attention in all parts of the United Kingdom to the subject of flax cultivation. The value of the flax crop to the Irish farmer, and the influence which the extension of the linen manufacture have exerted on the prosperity of Ulster, are strongly illustrated in the history of the once insignificant town of Belfast, which has become the linen metropolis of Ireland, with a busy population of 140,000 inhabitants. Forty years ago this town did not possess a single spinning-mill. Of the 700,000 spindles now at work in Ireland, more than three-fourths belong to Belfast and its immediate neighbourhood, and of the 35,000 persons employed, a like population is located in Belfast. In almost every street of the town palace-like warehouses are springing up in the place of the old dingy offices; and though in July, 1863, the assistance of 8,500 power-looms had been added to the productive powers of the factories, yet so great was the increased demand caused by the dearth of raw cotton, that our spinners were unable to meet the requirements of their customers. Though there was last year an enormous increase on the home supply of flax, yet the iron fingers of our mills consume far more than the fields of the United Kingdom have yet produced. The area devoted to the cultivation of the plant in 1864 amounted to 301,942 acres; while in 1809 only 35,056 acres were produced in Ireland. Last year, from the want of adequate preparation and unskilful management, many farmers were disappointed in their expected profits; and, in the present year, in some remote districts where there are no

scutching mills, and the people do not possess that knowledge of the crop which exists in Ulster, it is probable that a smaller amount of the crop will be grown. It is to be regretted that there should be any decrease in the home supply; for it is not merely in Ireland that the demand for raw material is likely to increase. The instructive reports of Mr. Alexander Redgrave and Mr. Robert Baker, inspectors of factories, for the half-year ending 31st October, 1864, which have just been published, show us that the following continental countries have added largely to their spinning power.

LIST OF SPINNING MILLS, WITH AN APPROXIMATION OF THE NUMBER OF SPINDLES, IN THE FOLLOWING COUNTRIES.

Country.	No. of Mills.	Spindles at Work.	Spindles ordered.	Spindles projected.	Number of Spindles 10 years ago.
Bohemia	34	137,900	72,700	4,000	33,000
Moravia	21	47,300	58,416	3,800	20,000
Prussia	22	133,800	38,200	8,300	47,000
Saxony	5	15,000	9,200	6,000	4,000
Austria	1	7,000	3,000	...	...
Hanover	3	8,000	...	...	...
Bavaria	4	10,000	...	...	2,000
Poland	1	4,000	...	6,000	...
Switzerland ...	3	5,000	...	...	3,500
Total	94	368,200	181,516	28,100	109,500

Thus, when the spindles ordered and those projected to be added are at work, flax spinning in the above countries will have increased in ten years 426 per cent. In France, Belgium, and Russia also a rapid increase in the number of spindles has taken place. In 1864 France had 563,000 spindles, and by the end of 1865 it is expected that this number will be increased to 680,000. Even with the enormous increase in the production of flax in Ireland last year, the produce of 301,942 acres, estimated at 75,485 tons, is far below the amount required by the spinners of the United Kingdom, who were obliged to import 91,406 tons from foreign countries, are thus forced to depend for the raw material upon countries which are likely, in the course of a few years, to dispute with us for the position which we at present enjoy as the chief linen manufacturers in the world. We are of opinion that Ireland possesses in her soil and climate advantages for the production of flax which, if her fields were judiciously cultivated, would enable her to produce more fibre than would be required to meet the wants of Europe. The mild, moist climate of the island is most favourable for that slow and regular growth of the plant which is essential to produce soft, yet strong, pliable, and easily divisible filaments, and its soils are in general easily reduced to that fine state of division which is necessary to enable the plant readily to obtain the materials required for its perfect development. It has at all times been necessary for our spinners to send to Belgium and France for the delicate fibres required to spin certain numbers. Hitherto, even in Ulster, our farmers have not given that attention to the management of the crop in all its stages which has long been devoted to it in some continental countries; yet we believe, judging from the samples of Irish fabric occasionally produced, that our farmers by judicious management might produce finer qualities of fibre, and thus secure more remunerative prices. It is an old saying, that "flax is either the best or the worst crop that a farmer could grow." The want of success, we consider, depends more frequently on the ignorance or carelessness of the cultivator than on the soil. We have seen attempts to grow flax upon fields which were rendered incapable of yielding profitable returns of any kind of crop. Still, as in the days of the poet Tassie, it may be complained that—

"Crop upon crop many farmers do take
And reap little profit, for greediness sake."

The treatment of the soil in many parts of Ireland excites the astonishment of those familiar with the efforts made in districts where agriculture is more advanced to maintain its fertilizing qualities. "Were," says the author of a sensible little work on flax, "human ingenuity employed upon framing a scheme which should have the power of converting the best

land into the worst condition, at the shortest possible notice, we can readily conceive that it must have a strong family likeness to the plan generally adopted in Ireland."

In both England and Scotland the cultivation of flax as a fibre crop has not at any time extended beyond a limited area. The idea that it exerted some peculiarly "scourging effect upon the soil" has at all times rendered farmers indisposed to introduce it among their regular crops. With respect to the exhausting effects of the culture of flax, chemistry teaches us that, like every crop grown by the farmer, flax takes from the soil certain constituents upon the presence of which its fertility depends. But it also teaches us that the amount of those materials which are necessarily removed from the farm is very small—indeed, much less than is removed by most of the crops grown on our farms; and that, provided we save the highly nutritious seed capsules, and consume them in feeding our cattle, and utilize the woody fibres of the stem, removed in scutching, as fuel, and restore the ashes to the soil, the quantity of inorganic matter carried off the farm in the fibre sold to the spinners is but trifling, and may be replaced in artificial manure at the cost of two or three shillings per acre. Properly managed, we believe that flax may be made one of the least exhausting of all crops grown by our farmers. The ignorance respecting the value of the fibre of the flax plant, which even at the present day prevails in some parts of England, is most remarkable, and was amusingly illustrated some years ago by the remark of an English farmer, who every year cultivated the plant solely for the sake of the valuable feeding which its seed afforded, that "he was puzzled what to do with the straw, as it was most troublesome—it would not even rot properly in the manure heap." In some parts of England the only use made of the straw is to employ it for thatch. The Irish farmer destroys the nutritious seed in the steep-hole, as he seldom removes them before steeping, but prizes the straw; while the English flax-grower, in many districts, sows the crop solely for its seeds, and despises the still more valuable fibre.

The sowing of the flax-seed should, if the weather permit, be completed before the beginning of May, though in some districts it is delayed beyond that period. In Ulster it is considered advisable to sow not later than the 15th of April; the usual allowance of seed being at the rate of 2½ to 3 bushels to the statute acre. The seed selected by our farmers is either the produce of Livonia or Esthonia, brought from Riga, or Dutch seed, which is preferred to Russian when the soil is strong and heavy. Great care should be taken in the selection of sound seed. Black seed, or that which has been kiln-dried, should be rejected. Sound seeds have a brilliant golden or clear-brown colour. The vegetative power of the seed is frequently tested on the Continent by sowing a certain number of the seeds in the month of February, when there is but little activity of vegetation, and the seed is considered a fair sample if one-half of the number sown produces plants. In the commercial cities of the Baltic the method adopted to ascertain the quality of the seed is to place over the fire a metal plate until it is almost red hot, and then to allow the seeds to fall one by one upon it. The sound seeds spring away with a report, while those seeds in which the oily parts have dried up, and which have become incapable of vegetation, remain on the plate and are burned. The sowing is invariably performed by hand broadcast. The seed should be covered with only a light coat of earth; and a light seed harrow, followed by rolling, will complete the work.

The flax plant is found, as might be expected, from the history of its extensive cultivation both in eastern and northern countries, to thrive upon soils of very diverse qualities, and in regions varying very much in temperature. Yet it is only in situations in which the proper climatic conditions exist, and on soils of special qualities, that its textile fibres develop themselves in perfection, or exhibit that combination of softness, strength, and fineness which renders the flax of certain countries so much esteemed. In European countries littoral regions constitute the favourite localities for its cultivation; and the plains of Belgium and Holland, the Baltic provinces of Russia, the coasts of the Mediterranean, and the maritime provinces of France are the districts from which our chief supplies of fibre are derived.

A friable, loamy soil resting on a well-drained clay bottom, free from stagnant water, should, if possible, be selected for the cultivation of the plant. On lands reclaimed from rivers it

may also be grown with advantage. Thus on the slob reclaimed from the river Foyle, in the county of Londonderry, which gave a soil that we found to possess the following composition, superior crops have been raised:—

COMPOSITION OF SLOB LAND FROM LOUGH FOYLE.

I.—BY WASHING.		
Clay and organic matters	10.97	}
Sand	89.03	
	100.00	Denomination, Sandy garden loam.
II.—BY ANALYSIS.		
Potash	0.11	}
Soda	0.03	
Lime	0.09	
Chlorine	0.17	
Sulphuric acid	0.06	
Organic matter	0.48	
Oxide of iron	7.49	}
Alumina... ..	3.31	
Lime	1.12	}
Magnesia... ..	0.09	
Carbonic acid	0.65	
Phosphoric acid	0.02	
Silica	0.28	
Organic matter	7.14	
Insoluble silicious matter	79.01	20.10 soluble in acid.
	100.05	

Nitrogen per cent. 0.10, equal to 0.23 ammonia.
Water in the sample, 11.38 per cent.

If the bed for the seeds has been rendered fine and level, and they have been deposited at a uniform depth, the plants may be expected to appear above ground in ten or twelve days. Under the influence of the showers of April they will rapidly put forth their leaves. When they have attained the height of three or four inches the farmer should carefully remove every weed that springs up to rob the plants of their fair proportion of the elements of the soil. A breezy day should be selected for weeding. In Belgium bands of women with bare feet, or list slippers, advance over the fields on all-fours, placing a cloth under their knees, and proceeding in a direction opposite to the wind, so that the soft and tiny plants pressed down in their course are elevated by the current of air, and enabled to attain an upright position. The loosened soil brings fresh supplies of food into contact with the absorbing rootlets, and the work of development goes regularly on. At this early stage of growth

the plants are not easily injured. We have made some analyses which show that each plant at this stage consists of—

Water	87.63
Organic matter	10.61
Mineral matters	1.73
	100.00

If the weeding be delayed until the stems become more rigid, from the increased amount of solid matter formed, much injury will be done to the regular growth of the fibre. Usually when the seed has been sown early in April, the crop will be ready for removal from the field about the end of July. The Belgian farmers, to obtain the fibre of superior fineness, recommend that the removal should commence “between the falling of the flower and the formation of the seed, so that unless it is wished to sacrifice the quality of the flax to obtain seed, the former must not await the full maturity of the latter.” In this country, however, it is considered that it is more profitable, and more likely to ensure a strong and fine fibre, to allow the plants to remain until the leaves have fallen from the lower part of the stem, and its colour for two-thirds of its length has acquired a yellow tinge. The flax is removed by pulling up the stems, which is all done by hand, the work in Ulster being chiefly performed by women. We think that some more expeditious method will yet be applied. We have heard that some years ago our inventive friends, the Americans, had hit upon and patented the plan of a pulling machine, which, with one horse, could pull and spread six acres in a day.

When there is a second growth of short stems, it is usual for the pullers to take hold of the long stems, just below the seed vessels, so as to leave the short stems for a second operation. The handfuls of pulled straw, as they are removed from the soil, are laid diagonally across each other, to be ready for the removal of the bolls or “rippling,” which should be performed in the field at the same time as the pulling is going forward.

The farmers of England and Scotland, who have learned to appreciate the highly nutritive qualities of the flax seed, will be surprised to find some of the growers of the crops in Ireland even at the present day contending that if the seed vessels be removed the flax will not “water” properly, or give fibre of a good quality; and in many of the best flax districts this notion every year leads to the destruction in the steep-holes of valuable food, which, preserved for feeding cattle, would add enormously to the profit of the farmer, and at the same time preserve the fertility of the soil. We have, in autumn, seen mounds of the valuable bolls decaying on the coasts of Down and Antrim, to which they have been carried by the streams from the flax pools.—*Practical Mechanics' Journal.*

EXPERIMENTS ON MARL.

With respect to ameliorating chalks, geology and chemistry have rendered great services to agriculture—the first by pointing out their repository, importance, &c.: the second particularly by determining their composition, and the conditions of the soils which require their use. In these respects, in fact, the application of chemistry is most sure. In many localities the instructions of these two sciences are received well; but in a far greater number they are rejected, either through ignorance of the advantages that will accrue from the light they throw on the subject, or through carelessness, which results from false ideas created by incomplete experience, and very often the presumption that enough is already known. Nevertheless, the power of calcareous agents as a means of fertilization is a fact well established in practical agriculture; and the matters which compose them abound almost everywhere. Still, by the intervention of men devoted to progress or careful of their own interests, marling is becoming more and more practised every day; and we may reasonably predict, from that fact, a very considerable increase in the production of certain soils, of great importance from their extent. But in Dordogne (my country), where the uplands are generally flinty clay or ferruginous, consequently covered with heather, and where the valleys—clayey flint—are very acid, generally

wanting in carbonate of lime, the farmers remain obstinately indifferent. They ought to know, however, that Limousin, which joins us, derives immense advantage from it, and that many of the provinces owe their richness to it.

Marl.—Marl is composed, in different proportions, of the same elements that constitute the earth—that is to say, of clay, carbonate of lime, flint in a sandy state, or silicates combined with alumina or lime. A good deal of it contains organic remains decomposed, and oxides, which colour it variously. But the aspect of this matter everywhere is considerably changed by the different proportions of clay, carbonate of lime, &c.; so that you scarcely find two marls alike anywhere.

Does marl, then, constitute in itself a primitive formation, independent of others of a mineral nature, as is commonly supposed, and as we should be led to believe from certain authors? Assuredly not; and it is important that we gain correct ideas in that respect, for many agriculturists neglect furnishing their fields with carbonate of lime, which is deficient, because they see no other means than employing lime properly so called, which is too dear, or marl such as they imagine it to be, and therefore believe themselves to be deprived of.

In most of the conditions of soils reclaimed by the use of marl, the efficacy of the improvement is almost exclusively due to the carbonate of lime. Consequently all matters, such as stones, marbles, clays, &c., which contain that calcareous salt in a divided state, and capable of combining itself with the earth, are suitable for marling. Thus what is vulgarly called "death-stone," all the stones which stratify themselves easily, and chalk are very advantageous for marling. We even read, in a treatise on agricultural geology, "Chalk is the richest of marls; for it is formed of calcareous matter almost in a pure state, or only mixed with a small proportion of sand." I obtain the marl I use from the side of considerable masses of calcareous clays, or in the "crevasses" that they present. In certain parts, where it is sticky and grey, it manifestly contains organic detritus, and possesses, from that alone, vast fertilizing powers; in others it is pulverulent, particularly in the neighbourhood of the nodules of ferruginous silica, where it is clearly sprinkled. We also find there very irregular fragments of silicate of lime, remarkable for their lightness.

This marly matter mixing itself without any very sensible friction with the calcareous mass, and the latter gaining greater density according as it is removed from it, we may infer that the two are identical in nature, and that the want of cohesion in the first is attributable to the presence of another mineral—possibly manganese—for we notice in it discolorations of a fine rose tint. Being, as I have been for a long time, under the intimate persuasion that marl is, at least here, merely clayey lime broken up, I often use the latter in its solid state, and cannot perceive the least difference in its effect, except in cases where the soil is very flinty, and requires clay as much as lime. I estimate, besides, that when the amending agent has to be transported from a very great distance, there is economy in the cargo containing a large quantity of the active principle; indeed, the matter cannot be spread until some months after, when it has become disintegrated.

There is a difference in opinion amongst geologists about marl. Some class it with the secondary earths, others among the tertiary beds of the terrestrial globe. The fact is, it is found in both. That from secondary earths contains, in many places, a great quantity of shells; but I have as yet only found amongst the marl I use some small ammonites, and they manifestly come from fresh water. Therefore the geological part of my work, the most difficult to me, is not the most interesting.

The Principal Modes of Action in Marl.—It is abundantly proved that every soil suitably provided with humus should, in order to be thoroughly fertile, possess in its constitution at least a small proportion of carbonate of lime, as the want of it renders the culture of most useful plants exceedingly unsatisfactory, even though the greatest care be taken in the cultivation of them. But when we give to a soil deprived of it that element, so essential to its normal composition, we rapidly double and even treble its production, because, on the one hand, healthy plants assimilate and nourish themselves in the proportions necessary to their perfect development, and, on the other hand, lands where lime is wanting saturate themselves with acids only suitable to useless plants, such as red sorrel, the small rush, bent-grass, conch-grass, brake, moss, &c. From that cause, the clearings of waste lands, impregnated as they are with tannic acid, never become fertile, in spite of the large quantity of humus they contain, unless they have been dressed with animal charcoal from lime or marl. It is the same with all vegetable earth containing oxalic and other acids injurious to the assimilable properties of economic plants. In such cases the calcareous acids not only neutralize the acids which stop the vegetative movements of plants reserved by Providence for the use of man, but, by acting chemically upon the decayed organic matter contained in it, they considerably facilitate the dissolution of it in the water, which afterwards serves them as a vehicle, and presents them to the absorption of the roots. Lands too flinty fail, from the cohesion necessary to resist the disintegrating action of the water, and do not retain sufficient humidity. Now, supposing that these soils possessed lime primitively, it must have been carried by the rains to depths inaccessible to the roots of plants: therefore, nothing can so effectually remove this serious defect as marl mixed with clay.

Compact, plastic clays often contain a sufficient proportion of carbonate of lime, as may be seen by the presence of bits of white stones easily crumbled, and also by the white crust

which covers the fragments of flint found there. In these lands marl can be but of little use in diminishing the plasticity and hygro-metrical conditions unfavourable to all good culture. But the cold clays without traces of carbonate of lime, and those which receive the waters of forests always acid, on the contrary gain infinitely from being copiously marled.

Is it therefore advantageous to marl a soil charged with ferruginous oxides, even when it is not deprived of the calcareous element? I do not hesitate to reply in the affirmative. In my experiments with marl I have always found the soil become sensibly more fertile, and even more easy to work; and one remarkable effect is that vegetable earth takes under the influence of the calcareous agent a very dark tint, as though the oxide of iron which coloured it had descended to the first degree of oxydation.

But calcareous agents for the use of agriculture are not limited in power to the very important modifications which they produce in the actual constitution of the soil, neither do they confine themselves merely to purging it of the acidity so detrimental to its natural fertility. Carbonate of lime evidently supplies nutrition to the plants; for chemical analysis has proved that the quantities relatively are considerable in the grains and straw of some cereals, particularly lucerne, sainfoin, clover, peas, colza, &c.

The vegetation in plants which have accidentally sprung up upon a heap of marl is sometimes prodigiously active. Thus, two stalks of hemp, placed under these conditions, grew the one to the height of 4 metres, the other to 3.72 metres; a single grain of wheat ripened with sixteen stems, each carrying an ear well filled. Some children had pulled it up when I should have cut it, so that I was not able to count the grains. The same thing occurred with a turnip, which appeared to have attained an enormous bulk. This marl seemed completely deprived of humus; but, as it came from a cave that had been dug very deep, it is possible that it contained some nitrous salts. I will now state some facts which justify me in the opinion that clayey lime may to a certain point suffice to the alimention of some plants. 1st. The field from which I get my marl is sown with sainfoin. The vegetable bed is not more than six or seven centimetres deep; but the roots descend into the calcareous mass to the depth of two metres, and the vegetation of that sainfoin is exceedingly fine. 2nd. I have separated some stalks of the same plant from the vegetable earth; and, although thus through the destruction of the coronal roots they could not draw out the nourishment that the calcareous matter contains, they grew as fast as the others. The same results were obtained from experiments upon colts-foot and briars. 3rd. I reduced some very clayey lime to a pasty powder; in appearance, at least, pure. I then put it into a small enclosure, and last November sowed there, all at the same time, some wheat, rye, and vetches. The rye perished; but the wheat and vetches resisted the cold of winter and flourished well. 4th. I spread over some sainfoin and lucerne some calcareous clay reduced to a powder. Some days after an ordinary rain the plants began to grow rapidly, and are now nearly three centimetres higher than those which were not so treated; but it is possible that the property which M. Payen attributes to lime of stimulating the assimilation of plants may have something to do with this phenomenon. Upon very chalky soils sown with lucerne and sainfoin, I have frequently made a covering of marl containing 80 per cent. carbonate of lime, and with marked advantage.

Method of using Marl.—Having determined the state of a soil which indicates the use of marl, I shall proceed to show the principal rules of it; but I must speak specially from my own experience. When we have a large extent of land entirely or very nearly deprived of carbonate of lime, we cannot employ the lime we have at our disposal better than in transporting that precious manure to the soil. It is not well to trouble ourselves too much about the season, only we must not expect to derive advantage from it afterwards, when we might have foreseen the drought. In fact every time I have sown or spread marl over grass-land under these conditions, it has done harm. Some wheat sown at the end of November last, in a field well prepared but strongly marled, has been literally burnt. I wished to make it a specimen of the efficacy of lime.

It is customary to put marl in small heaps on the land, and leave it there for some time, in order that it may be submitted to the action of atmospheric gases. Now, I proceed in a different manner. If the marl is powdered, I spread it as soon

as possible, in order that it may be well mixed with the soil by continued labours; but if it is in calcareous fragments, I do not leave it longer in heaps than is absolutely necessary, for this reason—piled up, it only disintegrates itself at the surface, and, even after a sharp winter, marling can be effected but very imperfectly when the fragments are buried in the same state as when they were placed on the soil, and only become decomposed in proportion as they return to it. Besides, how can lime be deprived of the action of atmospheric agents by being dispersed? Is it not advantageous to the impregnation of the soil through it in case of rains, and is it not an additional means of drawing the greatest part of its faculty of decomposing the matters which resist the dissolvent action of the waters without its aid?

With regard to the quantity of marl there can be no precise rule; it is only after repeated trials that the most efficient dose can be determined.

Besides, when there is a great extent of land to be reclaimed by the use of it, it is more profitable to marl the whole, than limited portions abundantly, except to renew the operation as quickly as possible. In fact, experience alone teaches whether it suffices to give much or little carbonate of lime to soils wanting in it, in order to at least double the production. Except in cases of cleared waste lands, I marl in the average proportion of 40 cubic metres to the hectare; but my marl is so rich in active principles that, placed under the litter of bullocks, it burns their hair, and will strongly affect the skin of the hands if touched often. When the proportions of clay are greater, the dose of marl must be increased accordingly, so that even 300 metres may be required; or, when the soil is very flinty, and if the marl only contains 20 per cent. carbonate of lime, in which case the best manure will be only clay marl.

With acid lands, it is a good plan to use marl as a covering to cereals, particularly when the rains are sufficiently heavy to penetrate through the soil. On the contrary, no immediate advantage can be derived when the weather remains dry; indeed no marling will succeed well under these conditions.

Marl brought into the meadows by overflowing is only useful so far as it is alone distributed there in minute proportions; but, if ever so little vegetable mould or manure be added, the water marks, upon its passage, traces of a vigorous vegetation; whilst without that addition, I scarcely know why, it favours the development of moss.

Lime and marl compared in an agricultural point of view.—No doubt lime should prevail when it is required to correct acidity in a soil, and decompose the organic matters which resist the dissolvent action of ordinary water; but, except in these two cases, marl, in a sufficiently divided state, and containing at least 50 per cent. carbonate of lime, is generally preferable. In the first place, lime can scarcely be supplied to the cultivator for less than 3 fr. the two hectolitres, which makes liming very expensive; and the effects of that operation, soon apparent if it is true, are often not of many years' duration. Then, it is not our object here to show the important difference between lime which has been subjected by free air to hydration and recarbonisation, and the natural calcareous marls. Even if it were so, there would still be an advantage in using the latter for clay, silica, &c.; as much of their cultural utility is comprised in being modifiers of the soil. In fact, notwithstanding the great advantages derived in agriculture from the use of lime, it never enters the head of intelligent practitioners to have recourse to it, when a rich calcareous marl is carried to them—that would be too much against their interests! Besides, marly products are evidently better suited to a sandy soil and the powerful consideration of the price of returns, and very quickly determines the difficulty of choice.

The products of marl and manure.—Many persons have been struck with the results of my marling, and have said to me: "Then it is evident that marl can fill the place of manure"; to which I reply that marl is an excellent means of increasing vegetable productiveness, and when used upon acid soils, full of decayed organic matter, like cleaned waste lands or marshy meadows, it often has even a more advantageous effect than ordinary manure; but it would not be the same under other conditions: the marl would then only be an auxiliary to the manure, singularly accelerating the assimilation of plants, by virtue of stimulating properties. Some possess the double faculty of assisting the decomposition of organic matter and exciting the activity of vegetable absorption. Upon this subject I must not omit to mention a fact, well worthy of attention,

that very cretaceous lands containing a large proportion of carbonate of lime, such as that existing to a considerable extent in Champagne, and many countries of the Perigord, if cultivated without sufficient manure, produce scarcely anything; but if, on the contrary, abundance of manure is supplied to them, they yield prodigious crops. That, then, is the source of the modern prosperity of Champagne, formerly, with reason, called lousy. Unfortunately, lime in that case expends too much humus, so that, in order to leave the soil in a thoroughly productive state, it is necessary to manure incessantly, and that is not always possible. Thus, we see lands near us, formerly sown with fine wheats, now abandoned as unproductive; whilst, in other countries, chalk soils have been rendered suitable for every culture through the effects of copious and repeated manuring, and by successive deep culture of the vegetable bed.

With a view to strengthening the fertilizing properties of stable dung, some one conceived the idea of adding lime to it; and it appears that even now this practice is maintained as advantageous in certain Departments. I have tried it with marl, and found it succeeded extremely well. I proceeded to raise the litter every two days, taking away the dung and urine to stratify with the calcareous matter in beds of nearly equal thickness. The cleansing of fifteen days is thus employed in making a heap of manure, which is left for the same time to ferment. If before removing it a thermometer is placed in the centre of the heap, it will soon be seen to rise to 95 degrees (F.), or even more, though the mass be not smoking, and exhales scarcely any odour. This is attributed (I think reasonably) to the action of the carbonic acid from the lime on the gases which are formed during the putrid fermentation, which action results in fixed saline combinations, thereby considerably enriching the manure; whilst without the intervention of the carbonate of lime these fertilizing gaseous principles would for the major part escape.

The same theory teaches us that the mixture of calcareous matters with spent manure has the effect of altering the quality of the latter by volatilizing principles which were fixed before; but it may be remarked that it is more convenient to make this mixture at the time of spreading.

This method of mixing ordinary manure should be adopted, especially where heath is used as litter. In the formation of manures, heath is really only useful as the exipient of excrements. Ligneous and tannic acid, it is suitable to none but compact clay soils, more or less calcareous, to excite them, and to those which are saturated with lime, like the cretaceous soils. In order to make heath useful in any other kind of soil, it is necessary to correct these defects by means of lime. Having put a thick bed of heather in the middle of a flinty clay soil, in order to facilitate cartage, we have, for the last four years, had crops less than half equal to our neighbours. If this observation is not unique, it completely confirms what I state. In every case, it should lead people to seek a better material for litter.

In conclusion, I would say that it is vexing to see such efficacious and economical means of improving soils, as marl represents, neglected as it is: indeed, the indifference shown to it cannot be justified when it is well known that many Departments derive their prosperity from the use of marl, and that wherever it has been tried the most satisfactory results have been obtained.

But the favourable results from the use of amending limes are not exclusively material. Under the influence of the freedom they give, the manners of cultivators improve, their personal dignity increases, and, as the statistics of crime show, man is less inclined to follow evil instincts, and observes the rules of honesty more strictly. These reasons are wanting neither in depth nor value; nevertheless, in the actual disposition of minds in certain places, they meet with only a disdainful reception, as though they took their source in fallacious experiments. But, in spite of prevention and carelessness, however deplorable both may be, progress will triumph over these obstacles; and those who reject it will bitterly regret having lost so much precious time, and not having sooner realized the good they might so have obtained.

VEYSSIERE,

President of the Agricultural Committee of Vergt.

—*Journal d'Agriculture Pratique.*

LORD LEICESTER ON AGRICULTURAL AFFAIRS.

At the annual meeting of the Docking Agricultural Association, which was held at Docking last week,

The Earl of LEICESTER said: I am afraid that I cannot congratulate you upon meeting under propitious circumstances. We have harvested the very worst wheat crop that I ever recollect in this district (Hear, hear), the natural result of having had no flag, no plough in, an unpropitious seed time, and early and severe frosts in the spring. I am afraid our prospects for the future wheat crop are not very bright. It is very desirable that in this district of the county we should get our wheats in early. It is now the 6th of October, and there is very little land prepared for the wheat crop. Our barleys on our light lands were burnt up, and on all lands they were badly got up. Yet as the barley harvest was tolerably general throughout the country during a period of wet weather, I think that our Norfolk barleys are likely to hold their own, and those who hold such samples as were contemptuously discarded last year are likely to meet, I trust, with a fair price. While our barleys were being drenched we were rejoicing in the hopes of an abundant root-crop. The extraordinary drought of the last five weeks has destroyed that prospect. Our mangolds are good, but turnips must be deficient in quantity if not in quality. I am more and more satisfied of the beneficial results pertaining to deep cultivation for the root crop (Hear, hear), and I am satisfied that one deep ploughing, and only one ploughing in the early winter, is the best means of retaining the moisture in the land, without which the turnip crop must be a failure. It is true that beef and mutton are fetching extraordinary prices, but we have to give nearly butchers' prices for our store stock. Our light land arable farms in West Norfolk are not adapted for the breeding of either cattle or sheep; therefore we do not derive that advantage from the high price of meat which we otherwise should do. And now, gentlemen, we are threatened with a disease in our cattle and our sheep; but I think that, from the exertions of the committee of our association, and especially through the exertions of Mr. Read—to whom we are deeply indebted (cheers) for the prompt and vigorous measures which were taken to prevent diseased cattle from infecting the healthy—with proper caution on our part and with a prospect of cooler weather, I trust we may escape severe losses from this calamity. This is a long list of grievances, but I think that we have learnt something from our trials that will be of service to us even in years of abundance. Continued prosperity causes the energies of man to lie dormant, and in the trials and difficulties we have had lately to contend with we have learnt some things. We have learnt that hay—the most costly crop we can grow—is not a necessary item in our produce. We have learnt the value of straw as a feeding article. We have learnt how to economize our root crop. And if we have learnt that it is desirable to give deep cultivation to the roots of our plants to enable them to seek moisture in the earth, the trials that have been given us have not been, I trust, in vain. But we have not met here solely for the purpose of talking over our own affairs, but to consider what progress we have made in improving the condition of the labourer. Although we may not be altogether prosperous at the present time, I think that I may say that he is. Labour is abundant, wages are high, and bread is cheap, and I think we may rejoice upon the moral and physical improvement of our labourer. Drunkenness used to be a common vice in this district. It was no uncommon thing to see a man intoxicated. But I think I can say that for some years I have not seen one of my labourers the worse for drink. It was impossible at one time to get any work done without an allowance of beer; it was beer here, beer there, and beer everywhere. Now I never make any allowance of beer to any of my labourers; I give a full equivalent in money; they prefer it, and I am quite sure that they, their wives, and their families are the gainers by it. I am satisfied, also, gentlemen, that there is no work but what can be done better without the beer that the men are in the habit of getting than with it. Many of my men

are teetotallers. I do not think that it is desirable that men who can abstain from drinking malt or spirituous liquors to excess should bind themselves by a pledge, but those who find they cannot control themselves and abstain from excess have done a wise thing in doing so. They cannot obtain the beer that we drink, they cannot obtain the light wines of Germany and France, which will quench our thirst without causing intoxication. If they drink, they must drink the drugged beer of the publican, which tends to excite their thirst and to cause excess; or they must drink the wretched stuff which is made at home, which is quite sufficient in itself to make any man a teetotaller. If the malt duty was repealed, the poor man's wife can never brew beer, and the money that is spent in the attempt had far better be employed in the providing other luxuries or comforts for her husband's home. I must now congratulate this union as being the only union in this country which has adopted that wise measure of a union settlement, and for having given a precedent to Parliament for passing an act which will do more to benefit the labourer than any other measure that has been hitherto attempted on his behalf. Up to the present time our duties and interests have been apparently antagonistic. I say, apparently, gentlemen, because we had begun to learn that, unless we provided proper cottage accommodation for our labourers within a reasonable distance of their work, we were likely to lose the service of our best labourers. We also consider that it was better to open our close parishes, and be subject to provide for the aged and infirm, rather than to depend upon the supply of our labourers from the distant and open parishes. That the evils which existed under the old law can be immediately remedied is impossible. Before the Act that was called the New Poor Law was passed, there were certain parishes in this estate that paid 19s. in the pound poor-rates. Certainly at that time, if it was not the duty, it was the policy and interest of the owners of the property to endeavour to diminish the population, and not to increase the cottage accommodation. But railways and other causes have entirely altered the position of employers and employed. And after all that can be done or has been done by Parliament, or by societies like this, the physical and moral improvement of the labourer must mainly depend upon his landlord and upon his employer. While I am upon the subject of rates I will allude to what I consider to be an injustice in the existing law. There has been lately a very wise and proper readjustment of the rates of our respective parishes, but there are certain descriptions of property that I think are unwisely exempted from being rated. I see no reason why the 2,000 acres of wood that I hold in this county—retaining them as I do for the purposes of game or ornament—all of which, if converted into pasture or arables, would be subject to rates, should not pay their quota to the poor-rates. This law was established years ago for the purpose of encouraging owners of property to plant timber for the purposes of the Royal navy, and when the reasons for that encouragement ceased the exemptions which were derived from it should have ceased also. I do not think that it would be right to value the woodland property at the rate as the lands adjoining. That land has been brought up to its present state of value by skill and capital. The land that is under wood should be valued according to its natural value if converted into land for agricultural purposes. It has been argued that it would be by no means desirable to alter a law so as to encourage the destruction of our wooded districts. The love of sport and the desirable appreciation of ornament that exists in all Englishmen's breasts is such that in my opinion there would be no danger of any material decrease of the woodland districts of this county. The difference that would be made in the rate would be comparatively inappreciable; but it would remove an act of injustice, and it would prevent that feeling of discontent which I can quite understand exists in the breasts of many of those who are not the owners of this description of property.

AGRICULTURAL COMMERCE IN THE LAKE DISTRICTS OF AMERICA.

It is curious and instructive to mark the progress of American cities in the lake districts, which are centres of agricultural commerce. We have been apt to look with surprise upon the progress of Chicago; but we have just received the trade reports of another rising town of the west, which is fast treading upon the heels of Chicago, and that is Toledo, in Ohio. As Chicago is the grain dépot and shipping port for Wisconsin, Illinois, and the other districts bordering on Lake Michigan, so is Toledo for Michigan, Indiana, Kentucky, and Ohio. Twenty years ago Toledo was but a village, with 1,000 inhabitants: now it boasts of a population of 20,000; and the rapidity with which it is growing, even at the present time, has hardly been exceeded by any of the cities of the West. Toledo is rapidly advancing toward a position among cities of the first class, and is already a great commercial mart on the chain of inland seas which skirt the northern frontier. In the grain trade she has already attained distinction, and enjoys the reputation of being second only to Chicago as a grain-receiving and shipping point. This is shown by the aggregate grain receipts at the three principal lake ports last year, in bushels.

	Flour and Wheat.	Indian Corn.
Toledo	14,108,993	1,041,160
Chicago	49,952,741	13,623,087
Milwaukie ...	12,337,679	473,309

It may be incidentally mentioned, that while as compared with 1863 there was a decrease at Chicago of about ten million bushels of wheat, and at Milwaukie of over four million bushels, at Toledo the decrease was so small as to be scarcely noticeable.

Let us now look into the details as furnished in the last annual statement of the trade and commerce of Toledo. The receipts of wheat at this port in 1859 were but two-and-a-quarter million bushels: last year they were seven-and-a-quarter million bushels, an increase over 1863 of one million bushels. The inspection, grading, and classification of grain by the Board of Trade of the city are very strict. The qualities chiefly received here are Michigan amber and white, and winter red Western. Michigan wheat is a special favourite with millers at this point, and also with those on the lines of canal and railroads at the East, who manufacture flour for leading markets on the shipboard. Canadian buyers, who visit Toledo confine their purchases of wheat almost entirely to this description, as it is safer to ship on a long voyage than any other, and yields a better article of flour, and more of it than winter red, which comes from Ohio and Indiana. The reason assigned for this difference, apparently in the same varieties of wheat, is that the farmers of Michigan allow their grain to stand in the field until it is fully ripe and very dry.

The receipts of flour during 1864, at Toledo, were a little over one million barrels, being a slight decrease on the previous year. This is attributed to the fact that many manufacturers, especially those of low grades, lost heavily the latter part of 1863, and were not disposed to assume the risk of making the flour, and then awaiting a market; for of this they had had a bitter experience during the two previous years.

The receipts of Indian corn at Toledo fell in 1864 below those of previous years, only amounting to one million bushels. This is attributable to the shortness of the crops of 1862 and 1863, and the heavy demand at the South for army use.

Of oats, there is comparatively little grown in this section of the West, and nearly all the home demand is supplied from points along this line of railroad and canals; 500,000 to 700,000 bushels is the total amount received. The receipts of barley are insufficient to supply the wants of brewers, and the deficiency is supplied from Canada. The facilities at Toledo for elevating and storing grain have been largely increased during the past two or three years, and the city has now capacity for storing nearly 3,000,000 bushels, and to receive and ship daily about 500,000 bushels. The value of the flour and grain received is set down for 1864 at 23,000,000 dollars, of the live stock at 3,250,000 dollars, and of the cured provisions 14,000,000 dollars.

The receipts of wool were very much in excess of former years, reaching about 6,000,000 pounds. Farmers in the vicinity, and throughout the south-west and west, are giving wool culture considerable attention; hence the shipments eastwards will continue to increase, and that, too, of the better grades, as farmers have learned that the profit attends the raising of fine-wool sheep. The business of sheepskins is very large, and appears to be increasing, at present exceeding 750,000. Toledo is one of the most important hide markets of the West, the receipts last year having exceeded 13,000,000 lbs. weight. Ashes, timber, tobacco, and furs, constitute other articles of receipt of no small importance, pointing this lake-town out as a great centre of transit between the Western and Eastern States.

While writing on the trade of this district, we may sum up with some agricultural statistics of the State of Ohio, which are important. In the ten years between 1850 and 1860 there was an increase in the land under culture of 35 per cent., the improved land now being about 13,600,000 acres, of which 4,600,000 were under grain, 7,000,000 under meadow pastures and fallow, 500,000 in orchards and gardens, 404,000 under clover, and 95,000 in flax. In 1863 and 1864, the abstraction of so large a number of labourers for the army seriously reduced the culture of productive crops. Up to the summer of 1863, the war had produced no sensible effect on the market of labour, and 100,000 men had been sent out before the diminution began to be sensibly felt in the operations of farming. One principal reason for this was the increase of machinery, which did the work of fully 50,000 men. But the want of labour was at length seriously felt, and in 1864 the harvest could not be secured except by the co-operation of the town-people and the assistance of female hands in many places. The lands are pretty well distributed in this State; but it will be probably a century before farms will become too small for profitable culture. In 1850, the census gave 125 acres to each landowner in the State; but the report for 1862 gave but 91, the number of owners being 277,000, of whom 240,000 were estimated to be actual farmers. Taking the whole valuation of lands (exclusive of town lots) at 500,000,000 dollars, and dividing it equally among 277,000 owners, the average to each man is 1,841 dollars, about £368. Looking at this as a working capital for a working man, it is no doubt sufficient for a comfortable support. But the real merchantable value is probably double this sum; so that the agricultural population of Ohio is not only in a comfortable, but in a wealthy condition.

ODDS AND ENDS OF FARMING FACTS.

(89)—*Cabbages as food* for milch cows have been singularly overlooked; the animals are very fond of them, and they appear to increase the flow, while they do not impart any taste of a disagreeable kind to the milk. The soil best adapted for the crop is a rich, strong, loamy, and friable one. It is almost impossible to over-manure cabbages. The best kind for a farm crop is the "Drunthead" or "Scotch," although the "Thousand-head" and "Jersey or True Cabbage" affords a large supply of green food. The seed should be sown in seed-bed early in March in a highly manured soil. The preparation of the field to which the plants are to be removed should be carefully done, so as to secure a considerable depth of well-stirred soil, and be well manured, at the rate of not less than twenty tons to the acre. The plants will be ready for transplanting the end of May or the beginning of June. In taking the plants up from the seed-bed, care must be used to prevent, if possible, the tap-roots being injured. Some think this is of such little importance that they purposely nip off the tap-root, believing that doing so favours the "hearting" of the cabbage. It is scarcely necessary to say that this practice is not dictated by correct theory. The process of transplanting is an important one; indeed, upon the way in which it is carried out depends the future goodness of the crop. Notwithstanding this, it is surprising how very carelessly it is generally gone through with. In this, indeed, as in every other department of labour, there is a right and a wrong way of doing. It is not the right way to make a hole in the ground and thrust the plant in, careless whether the plant is doubled up or not, or whether it is brought in close contact with the soil. If the root is not straight, the development of the plant will be slow and unsatisfactory; and if the earth is not brought up to the plant, more especially if the weather is dry, it will be likely to die altogether, or at least languish for lack of moisture. We have seen cabbage plants so carelessly put in that the slightest pull was capable of removing the plants altogether. They must be firmly embraced by the soil. It is a disputed point whether dry weather is the best for transplanting. Cobbett was a great advocate for transplanting in dry weather and in a dry soil. The general opinion is that the plants do best when the soil has been wet with recent rain, and the weather moist for some days after plants are in.

(90) *If cabbage plants are dibbled-in* at distances of thirty-six inches from each other, and the drills are thirty-six inches wide, 4,840 plants will be required for an acre. The plan of setting-out plants in the angles of hexagons has been recommended, the rows in this case being thirty-one inches wide, and the plants thirty-six inches apart in the rows: each plant will stand three feet from its neighbours on all sides. On this plan, with other widths of drill, the following gives the distance between the plants proportioned to such: Thus, for a width in the drill of one foot eleven inches, the distances between the plants should be two feet three inches; with a width of three feet two inches, three feet nine inches distance; with three feet ten inches—distance, four feet six inches.

(91) *In every acre of grass*, of an average crop, from 400lbs. to 420lbs. of ash are taken from the soil. The ash of hay is made up as follows, from which will be seen the importance of supplying grass lands with minerals, to restore those fertilizing ingredients so rapidly withdrawn: Of potash, 100 parts of hay have 18.11; of soda, 1.35;

lime, 22.95; magnesia, 6.75; oxide of iron, 1.69; phosphoric acid, 5.97; sulphuric acid, 2.70; chlorine, 2.59; silica, 37.89. Of all the four crops, wheat, oats, barley, and hay, the latter takes the greatest amount of nitrogen from the soil—three parts more than wheat does, five more than barley, and seven more than oats.

(92) Mr. Bowditch puts the *exhausting nature of the hay crop* in this way: "As wheat (ripe), for every 1000lbs. of its weight of grain and straw, takes 10lbs. of nitrogen from the soil, barley (ripe grain and straw) 11lbs., and meadow grass hay aftermath 14lbs., some notion of the quantity abstracted per acre by each of these crops may be obtained when we consider that the average crop of each per acre is thus: Wheat, 25 bushels, of 60lbs.; straw, 1½ tons=48 cwt. Barley, 40 bushels, of 63lbs.; straw, 1 ton=42½ cwt. Hay, first crop, 1½ tons; second crop, 1 ton, or in all 50 cwt."

(93) All sorts of opinions diverse enough are held as to the period when grass lands should be manured, some maintaining "any time" may be chosen, and graphically enough saying that, "any quantity" may be given, and that it is scarcely possible to give too much. This, of course, refers to the farm-yard manure or dung; when artificial or portable manures are used, the best time for their application is in spring. Autumn manuring with dung seems to be the most in favour, and justly so, especially if the dung is long and not easily assimilated with the crop. One great advantage—and it is not always thought of—obtained by the top-dressing of meadows with long manure in autumn is the protection or shelter yielded by it to the grass in the severe frosts of winter. Some who have paid attention to this maintain that fully one-half of the advantage obtained by autumn top-dressing of grass lands is owing to the shelter given to the plants during frosts by the comparatively bulky manure.

(94) *Of artificial grasses* for one year's hay in heavy soils, the following is the quantity per imperial acre: (1) Lolium italicum, 9lbs.; (2) Lolium perenne, 15lb.; (3) Medicago lupulina, 1lb.; (4) Phleum pratense, 1lb.; (5) Trifolium hybridum, 1lb.; (6) Trifolium pratense, 8lbs.; (7) Trifolium repens, 2lbs. For one year's hay and two years' pasture: (1) 9lbs., (2) 15lbs., (3) 2lbs., (4) 2lbs., (5) 2lbs., (6) 4lbs., (7) 4lbs., to which should be added 2lbs. of (8) Dactylis glomerata; and 2lbs. of (9) Trifolium pratense perenne.

(95) The prolific nature and hardy habits of weeds (see Facts 69-70, No. V., New Series), and the rapid ratio in which they exhaust the soil, are points too frequently lost sight of, important as they undoubtedly are. It seems to be very much lost sight of that the ground was "cursed" in this very way, bringing forth weeds in place of food fit for man. They are a two-fold nuisance—they occupy space which should be occupied by the plants, and they exhaust the soil of those fertilizing ingredients which the plants require. It is but poor farming to appropriate soil, space, and manure to weeds. But although the ground has been covered by weeds, it is an exceedingly suggestive circumstance that the curse can be easily changed into a blessing, and that simply by exterminating the weeds. Not only are the weeds taken up from the soil they occupy so uselessly, and the manurial resources upon which they draw left to the proper occupants of the soil, but the getting rid of them brings about that very condition of soil so beneficial to the plants which probably occupy it, enabling them to draw more readily upon

the manurial resources both of the soil and the atmosphere. Hence it is true that the faster the weeds grow, inasmuch as they demand a ready and complete clearing off, so much the more benefited are the regular crops if this clearing off is effected: and it is a curious enough thing to suppose, as has been supposed, that weeds have a beneficial office to perform, urging man to labour in getting rid of them, so that the ban can be changed into a blessing. The rapidity with which weeds propagate themselves need not be wondered at, when we consider how numerous are the flowers and seeds they have; as will be seen from the following, compiled from a table drawn up by that eminent agricultural botanist, Professor Buckman: (1) Groundsel (*Senecio vulgaris*) has 130 flowers and 50 seeds in each flower, total 6,500; (2) Chickweed (*Stellaria media*), 10

seeds in 50 flowers, 500 seeds; (3) Corn-cockle (*Agrostemma githago*), 370 seeds in 7 flowers, or 2,590 seeds; (4) Red Poppy (*Papaver rhœas*), 500 seeds in 100 flowers, or 50,000 seeds. We need not wonder at our fields having a red hue from the hosts of this plant which grow in them. (5) Charlock (*Sinapis arvensis*), 10 seeds in 400 flowers, or 4,000 seeds; (6) Corn Sow-thistle (*Sonchus arvensis*), 190 seeds in 100 flowers, or 19,000 seeds; (7) Black Mustard (*Sinapis nigra*), 6 seeds in 200 flowers, or 1,200 seeds; (8) Fool's Parsley (*Ethusa cynapium*), 2 seeds in 300 flowers, or 600 seeds; (9) Wild Carrot (*Daucus carota*), 2 seeds in 600 flowers, or 1,200 seeds; (10) Wild Parsnip (*Pastinaca sativa*), same as No. 9.

CLOVER AS A MANURE.

Professor J. B. Turner, of Jacksonville, Illinois, in a letter to the *Prairie Farmer*, gives his views upon the subject of ploughing in clover as a manure. He says:—

"I do not think that the common theory, that clover roots run deep, has anything to do with the matter; for they never run as deep as corn, or even as deep as wheat is reported to have done. But here is a whole subject most deeply interesting to farmers, which is as yet almost totally uninvestigated. The extant philosophies on the subject in the books are, many of them, if not absurd on the face of them, at least unproved.

"My attention was first called to this subject by observing, many years ago, that a stray root of asparagus, growing out of the centre of a bunch of fleur-de-lis, without any culture or any manure, but standing with a grass sward all around it, grew much more vigorously than other bunches only a few feet from it highly cultivated and annually manured. I observed the same thing of another bunch standing over a grape-root, but not shaded by the vine. In many other plants I have observed the same thing—namely, that two growing together will grow better than one alone; while, in other cases, two will not grow together at all. I now see from my window seed-parnsip stems, near seven feet high, growing out from under the thick shade of a Scotch pine; while others in the open ground near are not half as high. I have also thought that some varieties of the vine received increased vigour and growth from their proximity to the elm, after the old classical fashion of our schoolboy days, when Virgil wedded the Roman 'vine to the elm,' and the teacher made us poor urchins tumble our dictionaries and grammars to find out what he meant, and whether any 'regularly-ordained minister or justice of the peace' was employed in that Roman matrimony. I have also thought that the vine grew better near the root of the yepress, and the peach under several sorts of evergreens, as I wrote to the Horticultural Society last winter, but which ideas their committee did not seem to favour.

"But I am fully satisfied that here is a field of investigation wholly unexplored, which all agriculturists and horticulturists should constantly keep their eyes open to—namely, *what plants are benefited by having their roots over or among roots of other plants*, while the conditions of air and light still suit their tops; and *what others are injured by the same or a similar contiguity?* Also what plants are benefited by coming after other plants, or growing on the same soil on which they have stood, and why is it so?

"We all know that there are many plants which will not thrive at all except in contact with the roots of other living plants or trees; while there are a few that will only grow out of the living tree itself, as the mistletoe and some of the mosses. It is self-evident therefore that the roots of some plants do in fact elaborate in some way food for others; while, it must be confessed, that the reverse of this is still more frequently the case.

"Now I apprehend that the real benefit which clover does to crops consists mainly in these items—

"1. Its power of absorbing and holding the dew keeps the surface of the ground perpetually moist, and thus greatly facilitates all those great processes of disintegration, comminution, and capillary attraction from beneath, and atmospheric absorption from above, referred to in my essay on the culture of crops, to which our State Agricultural Society awarded their last premium on that subject; compared with these mighty processes of nature, the mere mechanical action of the roots of clover, or of hickory trees, even if they run through the solid globe, would be as nothing.

"2. One genus or species of plants undoubtedly dissolves and consumes more of certain mineral elements in the surface soil than others; and, by such dissolution and consumption, of course liberates and dissolves, and leaves in the soil a corresponding amount of free elements, which it does not need or consume in perfect comminution, ready for the use of the next *dissimilar* crop.

"3. Whatever either the roots or the tops of a plant have gathered and elaborated from either the earth or the air, if ploughed in or left to perish in or on the soil, is of course so much matter prepared for the next crop whose nature is such that it can use it; so whatever any living root gathers from the soil or air, and exudes into the soil from its still living roots, that is either nutritious or poisonous, or injurious to the roots or crops, will make itself manifest from its effects on such crops. For example, some sorts of grass and weeds will grow vigorously quite up under the shade of an osage orange hedge—some even better there than anywhere else; while young osage plants themselves, and many kinds of crops and plants, will not grow anywhere near or over its roots, however good the light and air may be.

"But I have only meant to indicate that here is a great and wide field for observation and experiment of most surpassing interest and utility, to which all our farmers should keep their eyes wide open, and of which even the first rudiments have as yet scarcely been investigated. I only design here to sketch the more probable outline of this most interesting field of investigation. The substantial, practical feature of all truly scientific or rational cultivation of the soil lies in this direction. It can never be explored or expounded by a few chemists in their laboratories, or a few savans in their philosophical retreats, however wise, useful, or learned; but it needs the million eyes, and ears, and hands of the whole people; and of no people more than the people of these western States, who enjoy opportunities of observing the natural growth of plants, and the alleged as well as real deterioration of soils, as no other people ever did."

THE LAW OF HYPOTHEC.

After a protracted investigation, the Royal Commission appointed to examine into the nature and working of the law of hypothec, as enforced by the landed proprietors of Scotland, have given in their report. The evidence obtained is very luminous, and, with but few and very weak exceptions, most decisive and conclusive as to the working of the law—or custom, for there is no written law to sanction it. Nor have the landlords any available plea for its continuance, that ought to stand a moment in competition with the gross injustice and injury its action inflicts, not only upon the agricultural but upon the mercantile interests of the country. It is true that by it the landlord is enabled, as he urges, to introduce an industrious poor man into the class of respectable tenant-farmers; but at whose risk and expense? Certainly not at his own; for simultaneously with the engrossing of the lease, and before, or at the instant of, surrendering the land, he snees out a sequestration over whatever and whosoever property may be found upon the land, should adverse circumstances induce him to follow up the sequestration to its final result. No matter, then, how much the tenant may be indebted to the merchant for manure, or to the machinist for his implements or machinery, or to the cattle dealer for his live stock, *all* comes under the fell swoop of the execution, and the landlord secures to the full extent of what is seizable, whilst the other creditors may take the leavings, which in some of the worst cases is *nil*. Such is the first effect of this most unrighteous business.

But the second step—which we have on a former occasion animadverted upon—is, if possible, still more unjust, and is best perhaps represented in speech by the words *legal robbery*. It cannot be too often exposed, until it is utterly done away with; and we therefore state again that, supposing a tenant-farmer sells to a miller or merchant, *by sample*, or otherwise than *in bulk*, in the open market, a quantity of wheat, barley, or other grain, and is duly paid for the same; if he is behind in his rent, his landlord can come down upon the purchaser, and compel him to pay again the full amount, although only the landlord himself is at all aware that the tenant is so indebted. This villainous usage, which has in several cases been put in force during the last two years, has no statutory act to sanction it, and is no more legal, in the strict sense of the word—nor, we will add, more in accordance with the present state of civilization—than the old custom of *black-mail*, which belongs to the same age and the same lawless state of society; so that the law of hypothec ought to have gone into desuetude with the *black-mail*.

The plea that poor men are enabled, by the law of sequestration, to take farms which they would otherwise be quite unable to stock, is a poor argument for the continuance of these customs. *We know* that by them the landlords have been enabled to let their lands at rentals that have astonished themselves as well as those farmers who possess capital, and who are still at times at a loss how to make a profit out of their farms. Thus the landlord in the first instance obtains a rent which he sees it will, at best, be difficult for the farmer to pay. He gives the man credit, it is true, for a year and a-half or two years, before he calls for his rent; but in the meantime the tenant is getting into debt also with his merchant, cattle-dealer, machinist, and other tradesmen, and, not having stock

enough of his own, he takes in *gist* stock of his neighbours, who want more feed than they have on their own land. All these creditors are kept in profound ignorance of the fact that the tenant owes his landlord back-rent, which he is unable to pay, until, to *their* cost, the sequestration, like a hurricane, sweeps off the whole, and puts it into the landlord's pocket, while the hapless tenant and his creditors are left to shift as best they may.

But what is the effect of the enormous advance of rents which this system has produced in Scotland? We have seen that poor men are enabled to take farms by the law of sequestration, because it enables the landlord to secure himself under any circumstances. But what, if a bad season or two bad seasons occur, is the effect upon the system? We can best illustrate this by quoting a letter from a Scottish correspondent, received a few days since:—"It appears," he says, "that the Scotch farmers must have been in a much worse state than even you have represented; for, though you judged partly by the sequestrations, yet it turns out that perhaps not a half, or may-be not a third, are registered, and therefore not published in the *Gazette*; whilst the landlord, unknown to the public, secures the money." Thus the landowner is really the only one who is benefited by the law, the benefit to the poor tenant being only contingent, depending upon exemption from a thousand vicissitudes that may, without any fault of his own, blast his hopes; though the landlord still not only obtains, in some cases, *double* the nominal rent he is entitled to, according to the real value of the land, but has that double rent secured to him by this one-sided law.

Again, what is its effect upon the body of agriculturists in Scotland at this time? Here again we will quote from the letter referred to: "It is clearly proved by the evidence that this law has a material effect in unnaturally and unfairly raising the rent of land to rates ruinous to the man of capital and industry. Very few respectable farmers are now bringing up their sons to their business, thinking it only a sacrifice of them to do it; and there would seldom be any, save for the necessity to have one to help him in old age; but the father even in this case is beginning to look upon it in the same light of a sacrifice of his son's future prospects."

Reason, justice, and common sense would suggest that if a land-owner desires to help and encourage a poor tenant, he should do it at his own risk and expense, and not at those of every one with whom the tenant is connected. The Lord has no right to claim the character of a benefactor, which he tacitly does, whilst he himself is the only one who is really benefited; and that in a double sense—first by obtaining a large nominal rent, far beyond the real value of the land; and secondly by converting that nominal rent into a *real* one by the sequestration that enables him to pay himself by the robbery of others.

As to the plea of surrendering the land to the tenant, we have on a former occasion exploded it. The owner risks *not one farthing* by it, whilst the tenant risks his capital, whatever it may be, his industry, and skill in managing the farm, and his character and credit in the neighbourhood. Such is the effect of this law, which it is to be hoped will not survive the first session of the new Parliament.

THE CATTLE PLAGUE ASSURANCE ASSOCIATIONS.

It was exceedingly desirable and eminently conducive to check the spread of "The Cattle Plague" to form as many mutual assurance societies as possible, "for assurance against loss in cattle by the disease called the cattle plague," and this has been effected to a very great extent: almost every district in the kingdom has now its Cattle Assurance Association, with specific rules for guidance, protection, and terms of compensation. I regret to say, that for the most part these rules are so loosely drawn up, and indefinitely worded, as to be entirely useless for enforcing a refractory member to obedience. It is only honourable men, who look at the spirit of them, and act upon them, that are alone aneuable; compulsory laws are, in fact, only to rule the dishonourable; good men require no bonds. It is, however, imperative that the rules of such societies should be as far as possible clear, distinct, and binding upon every individual member. I send you a copy of one set of rules now before me; they are as comprehensive and as binding as they can fairly be made, without the adoption of the Limited Liability Companies Act. It is under this act alone, I believe, that powers can be given to make these associations legal companies, and thus render every member subject to their rules or laws. How then do these associations stand in reference to legal powers? They are voluntary societies, and stand precisely upon the same footing as Friendly or Benefit Societies, which, to my mind, is a very unsatisfactory position. The members of these societies subscribe to raise a fund to be applied to the relief of sick or infirm members, according to rules made for each society's specific guidance: there is a proper office, under Her Majesty's Government, where such societies may be enrolled; Her Majesty, or her officer, then engages to see that each poor member is righteously dealt with, so far as their funds will permit; when their funds are exhausted no further demand can be enforced. If a member ceases to pay his subscription, he is either excluded by the rules, or by a committee of the Society named for such purpose according to rule, but the Society has no power to enforce the payment of a single subscription. And further, there is this anomaly: Any member suffering from sickness or any infirmity which entitles him to weekly pay can enforce such payment so long as the Society has funds in hand; but the Society cannot enforce the payment of such member's subscription: their only remedy is exclusion; but even failing that, he, so long as he continues a member, can enforce payment of his weekly pay till the funds are exhausted. Of course, such societies take early opportunities to effect the exclusion of defaulting members. The saving feature in these societies is this—that no demand can be enforced against any officer or individual member of these societies, except it can be proved that *they have funds in hand to meet such demands*. Now I apprehend that every Cattle Assurance Association or Society which has not adopted the Limited Liability Companies' Act, and has formed itself into a regular company, is in precisely similar circumstances with Friendly Societies, except the registration of such societies. This is a most important consideration. Mutual Assurance Associations are all right and all correct amongst true and honourable men. They require no further binding than their own promise to pay when called upon. But is every member of these societies to be thus depended upon? Remember, it is not a sick member's weekly pay. It may in-

volve the payment of hundreds or thousands of pounds—yes, of hundreds of millions collectively. Suppose all to be honourable however, and every one pays his calls, there may be such an outbreak of the plague as to ruin numbers. What then is the position of the remaining? It may be a very difficult and perilous one, without members acting dishonourably. The subscriptions of course smaller, the risk much greater. But suppose members act dishonourably, which I fear is more likely; *i. e.*, that a fund is raised, and duly placed to account of the treasurer, and the cattle plague breaks out: the claims soon exhaust the funds, great fears and terror on all sides arise, a call is made upon the members, many repudiate, others decline paying, and thus cripple the society. There is no remedy: payment cannot be enforced. The early sufferers alone receive the benefit. Suppose, again, that the members of another Association pledge themselves to raise a fund upon the first outbreak of the plague within their limits, as a compensation fund. Suppose many members refuse to pay their quota, and no means are known to compel them. The claims must be inadequately met, or there is great hardship and responsibility on those who do pay. It is self-evident that the distribution of a payment over a large number is a much lighter burthen than over a few. It is also very hard and unsatisfactory to a suffering claimant, inasmuch as he cannot enforce his claim unless there are funds actually in hand. It would also be very perplexing how to act in such a case, because if only one member pays up, it forms a fund. It would be better to place the sums, during collection, in private deposit, till the whole could be paid over to the treasurer. It would never do for any small number of members in any society to have to stand the brunt of pressing claims, without a fund to draw upon. It may be said that all these societies are dependent upon the honour and patriotism of their members. I know it. There is, as I have shown, nothing else to depend upon. I have, however, many doubts relative to this honour in the mass, not in the abstract. Wait till the hour of trial comes: many will then find their faith fail: many will withdraw rather than incur heavy calls: heavy payments cool much courage and honour. I have but little faith in these purely voluntary efforts: and should the plague last ten or twelve years, as from 1745 to 1758, it would swamp every one of them. There must be something more attempted. Just fancy that one-fourth of our cattle may be sacrificed, as then. Why, it would require nearly 30,000,000 of pounds to cover the loss. What could our voluntary societies do, with such a sum to pay? Depend upon it there must be other measures taken. These voluntary societies may work well when backed up energetically by the Government. They may form the machinery, but the Government must ultimately supply the motive power—Government must ultimately take up the question of compensation. These societies might be so organized that all relief might come through their recommendations and under their auspices, each in its respective district. The question need not remain long in abeyance. The Government have no power to award compensation without the sanction of Parliament. John Bull don't allow his purse-strings to be undrawn by an Order in Council. But Government might announce that they would receive claims for compensation subject to the approval of Parliament. This would restore confidence, if such claims were ordered to be made

through the many organised societies. It would give them a good standing and no little popularity in the country. In this way they may be made extremely useful. They do now embrace the picked men of the agricultural body, and thousands more would enrol themselves members. As to the amount of compensation to be paid by Government, I would say this: The cattle owner has no equitable right to bear all the loss this cattle plague may entail upon him. It is for no fault or failing on his part that such losses are sustained. It is a national calamity, and the nation should bear a fair share of the loss; but to insure due care and caution on the part of the owner, and to prevent imposition, I would insist upon it, and make it binding upon every owner, to ally himself with some local association as a member, and only through such association shall he receive compensation. I would further re-

gulate the proportion of compensation thus. The associations shall be responsible, and pay one-third of the amount of established claims, and the Government two-thirds. I name this proportion as being fair, owing to the expenses attendant upon keeping open these associations. One great advantage attending this organization would be the virtual legalisation of these societies. Of course if members are only to be compensated through their operations, every member will strive to keep upon correct and prompt terms with them, and these societies on the other hand will take care not to prefer claims till all their demands are met satisfactorily. It would wonderfully conduce to the independence of these associations. I am convinced that sooner or later Government must render very considerable help, and the sooner the better, lest these associations should flag and dissolve.

THE RECLAIMING OF PEAT BOGS.

DIFFERENT METHODS OF DRAINAGE.

It would take a long summer's day to tell how the bogs of Ireland could be drained and brought under profitable aration, to say nothing of the large areas of peaty soil in the United Kingdom that are barely half reclaimed from their original state. We cannot, for example, with hardly an exception to the contrary, take a railway pleasure-trip from the British capital in any direction without in a very short space of time finding ourselves surrounded with bog-land almost swimming in water; while in the sister-country it is no great exaggeration to say that the best half of her superficies is live bog! In the north of Ireland the drainage of Lough Neagh would not only reclaim a large territory of bleak, comparatively-barren peat-bog, but add a new county to the province of Ulster at present wholly under water. In each of the other three provinces—Connaught, Leinster, and Munster—immense areas of waste bog could be profitably added to the agricultural resources of the country, and doubtless will be so added at no very distant period of time.

The reclaiming of peat-bog is therefore *per se* an Irish topic; and the drainage of Lough Neagh would of itself form a voluminous subject were we only to confine our observations to a faint outline of what has already been said and written upon it. During the summer of 1844 we were professionally engaged in extensive drainage and embanking operations in the Upper Bann and two of its tributaries; and during the summer floods of that season, it would take the volubility of an Irish tongue to describe the flooded state of the country far and wide on both banks of that river. The low-lying grounds on the Shannon and its tributaries are if possible in a worse state of drainage; and the same may be said of the great bogs that are drained towards the eastern and southern coasts.

The main-drainage or river drainage of Ireland is therefore the first great work that must be undertaken towards the reclaiming of her immense bogs. The proposition is not a very encouraging one; for, when so little unanimity prevails amongst the landed interest of the sister-country, it is no easy matter to see how such a national work is to be determined on and practically completed. The past and present plans of applying to the government of the day for professional skill and to the public purse for pecuniary assistance may be better than doing nothing at all, and that is the utmost that can be said in favour of either; for they are unquestionably both bad alternatives—alternatives that must be avoided before anything like practical success can attend the work. In saying so, it must be borne in mind that we are not throwing out any uncharitable reflections towards Irish landowners; for the major half of the Irish landocracy in question include at the same time the best of English landowners. The physical difficulties that stand in the way of progress are those peculiar to Irish bogs; for they all have their source and origin in the immense peat wastes that on almost every large estate approach their owners for the want of thorough drainage! More practically speaking, the greater area of Irish bog can-

not be thoroughly drained on the plans hitherto proposed, owing to its depth; while that which lies at a sufficiently high level for the removal of stagnant water, and the complete aeration of the soil, won't pay interest on the capital required to be invested in the performances of the work, including all *etceteras*! Such are the general conclusions arrived at—more especially as regards the main or great river-drainage works involved.

Whatever force the above conclusions may have had at former periods, in the progress of applied science they at the present time cease to have any weight—the improved means, mechanical and chemical, now at the command of landowners being amply sufficient to enable them to overcome all physical and pecuniary difficulties that stand in the way of the profitable reclamation of Irish bog, generally speaking. There are no doubt exceptions at the two extremes, so to speak—viz., bog lying on too-elevated ground for the growth of corn crops, and, at the opposite extreme, small areas of bog lying below the level of the main drains or rivers, too small in extent to cover the expense of machinery. But such exceptional examples are so few and far between as to be unworthy of farther notice. On the contrary, Irish bogs generally are proverbial for their bleak and dreary dimensions, extending far and wide beyond the view of the observer, the two extremes in many cases sinking below the horizon when he is standing towards the middle of the bog, thus inviting as it were all the mechanical appliances of modern times to effect their thorough drainage. Had Lough Neagh been an arm of the German Ocean on the coast of Holland, the last drop of water in it would have been thrown into the sea centuries before now, and the whole area within, far below the level of the ocean outside, swarming with poldering thriving Dutch boors enjoying the fruits of their industry; and had the Shannon, about the drainage of which so much has recently been said in Parliament and out of Parliament, been flowing through our English fens instead of through Irish bogs, the whole of its voluminous contents would have been pitched over high embankments by the sheer force of steam into "new cuts" and "higher levels," and the whole of the bog land thus drained thoroughly clayed and brought under profitable cultivation long before now. But, fortunately for the future of the Emerald Isle, although unfortunately for the past and present, the Shannon flows as it ever did into the broad Atlantic through part of Connaught and Munster, while Lough Neagh continues to remain almost in the very centre of the province of Ulster, and while Irish landowners continue to bamboozle Parliament every session about the drainage of Irish bogs and the English Exchequer on the old plan of governmental gravitation! The Dutch shot ahead of this old rule centuries ago; English agriculturists were not slow to follow the example of their Continental neighbours; and now that Ireland is in the waning half of the nineteenth century, it is certainly high time for her landocracy to join practically in the march of improvement. Hitherto, one of the greatest drawbacks to the permanent improvement of the sister-country has been a blind

credence to the fallacious notion that her moist climate and soil would not pay for skilled labour and improved machinery. Nothing can be more unfounded or unworthy of the age than fallacious dogmas of this kind; and we repeat it is certainly high time, not only for Irish landowners but for all classes of the sister-country, to toss to the winds all such groundless superstition, for the very contrary of this blind credence is in reality the sterling truth, as the future is fast promising to prove in each of her provinces.

Much more practical and enlightened ideas of physical improvement have everywhere of late been fast expanding the agricultural mind throughout the length and breadth of the sister-country; and we aver that before long her extensive bleak and comparatively barren bogs will be no longer a discredit to her agriculture, but the contrary. This is manifest at sight; for the greater the magnitude of the undertaking of reclaiming her bogs, and bringing them under profitable aration, the greater will be the credit due to the master-minds that effect their thorough drainage and complete the other branches of the great work of reclamation. Although we have examined a large extent of the shores of Lough Neagh, and of several of the other bogs in question, and read most of the published reports of other professional men, we are nevertheless far from being in a position to give a practical opinion how any one of the great Irish bogs should be drained, professionally speaking. In some cases it may be possible to destroy the surface vitality of bog by drainage, aeration, lime, sand, and clay, without wholly removing the bottom water. If, for example, four-foot small, parallel drains can be got in and kept working by means of open ditches of twice the depth, the stagnant bottom-water under this staple may not require to be pumped out by machinery. But in other cases the more advisable and cheaper plan in the end may be the surrounding of the bog by a high-level main-drain for intercepting and removing the influx water, and then by the drainage of the whole of the interior bog-water—surface and bottom—into this higher level by means of pumping machinery. If the subsoil is open rock or porous gravel, the work of bottom drainage may be simple; for we have known the cutting of a very small vein of sandy gravel drain a large area of live bog, which previously would not carry neat cattle. But if the bog is incumbent on impervious clay, which is often the case, and indeed which may not inaptly be termed the instrumental cause of the bog, deep open cuts to the bottom of the deepest part of the moss, pipage, or tunnelling may be necessary. The drainage engineer has here three plans at his command, besides the several combinations of them which the facts of the case may determine; and by such means we aver that there is not a single bog in Ireland which may not be effectually drained at an outlay of capital much under what the returns would cover under judicious management; for when once the bottom of bogs is conquered, their surface is easily brought under the subjugation of the steam plough.

To this conclusion there will doubtless be many wry faces amongst the owners and tenants of Irish bogs, besides much shrugging of the shoulders at the primary data from which it is deduced. We are no strangers to such indications, having met with an outpouring amount of plain Irish on the spot—*i. e.*, when surveying Irish bog in 1843 and 1844 for large landowners, who were waiting for efficient drainage on the principle of *government gravitation*; and who, for aught we know to the contrary, may still be waiting hopefully but impatiently for the lowering of the Lower Bann, Shannon, &c., but who ought to have surrounded their bogs with high-level drains, and to have started draining pumps long before then, and who will have to employ such machinery were the ensuing Parliament to set about the lowering of all the Irish rivers in question to the heart's desire of their owners! In some cases bogs may be intersected by high-level cuts passing through them by means of embankments on either side, as the Ouse does through the fens of Cambridge and Norfolk, when the water on either side may be pumped into those over the embankments thus formed. Other bogs may be drained by syphons either having a uniform or intermittent flow, or both, as circumstances may determine. The floods of Ireland are large, and suitable provision requires to be made for them, whatever may be the method of drainage; and the more artificial the method pursued, the greater the necessity of attending closely to this practical rule. What may be the lowest area of bog that would justify the construction of machinery

for its drainage is one of those controversial questions which we shall not attempt to solve. We might, no doubt, safely go into the details of several actual examples, varying from a hundred to two thousand acres, did our space permit; but so diversified are the practical data at issue that no one of these examples furnishes a working formula for the drainage of a second. In short, although we are obliged by our limited space to confine our observations to a general view of the subject, yet in practice generalising data must be tossed to the winds, and the facts of each example of drainage be allowed to speak for themselves as it were, thus determining their own rule for the carrying out of the work.

Much of what has been said of Irish bogs is applicable to English and Scotch bogs also, and to a large extent of our English fens, which are not much more than half drained. In point of fact were Irish bogs no better drained than a large area of our fens are, the money thus invested in them would be thrown away. Hence the practical conclusion for the English-fen practice forms no working rule for Irish landowners to reclaim their bogs. In both cases more machinery is required.

CLAYING, LIMING, WATERING, AND MANURING.

When once peat-bog is thoroughly bottom-drained, it sinks and consolidates, but remains comparatively barren and incapable of yielding any crops, save heath and the like. Before corn and other cultivated crops can be grown, it has to undergo a series of processes of cultivation and manuring, and these form the subject of our present paper.

An old plan was to plough and burn the inert heathy staple in large heaps, under a slow smouldering fire, spread the ashes, sow, and harrow, by which a poor crop of oats, or turnips, rape, cole, &c., was reaped the first year; but with an increase of staple, and the decomposition that follows the incorporation of the ashes, the subsequent crops improve.

There is present in newly-drained bog a large amount of matter that is noxious to vegetation, while it contains very little available food for the corn and other cultivated crops. Much of this noxious matter is soluble, and may be washed out of the soil by the rains of the different seasons under a proper course of tillage; but it is also easily decomposed, or "rotted out," as it has in some districts been popularly termed, by the introduction of ashes, manure, clay, sand, lime, and substances that both induce chemical change and also supply the elements of food to the cultivated plants grown. But a proper supply of rain-water, or pure water artificially applied, is also essentially necessary to secure the practice of the fertilizing process, and the proper supply of this all-important element (water) is often wanting, owing to the effect of drought upon peaty soils. Hence, in a series of dry seasons the process of fertilization is often ruinously slow. Hence, also, one reason why a top-dressing of clay enriches a peaty soil in a very high degree, because of its affinity for moisture, night dews, &c., which enables it not only to supply water directly to meet the wants of the plant, but in the first place to promote the decomposition of the inert vegetable matter that constitutes peat earth.

The work of fertilization is thus a compound process, as it were, consisting of a series of elementary operations of a chemical character that require to be carried out conjointly, in order to produce the greatest effect in the shortest time, and at the lowest outlay of labour and capital. Such being the grand proposition at issue, it is manifest that in large undertakings, such as the reclaiming of the immense bogs that cover such a large area in Ireland, and that in some places of the United Kingdom extend to several thousand acres, in individual and contiguous examples, success will greatly depend upon the proper organization of these several operations, together with the command of clay, sand, lime, water, &c., employed in the carrying of them out into practice; consequently the details of each of the conjoint operations require to be duly taken into consideration, and matured before the work of improvement is begun, whether it be done by the landowner himself or by a contractor.

Of the materials required for mixing with the newly-drained bog staple, clay, sand, and water are probably the chief, owing to the greater quantity of them that is necessary in the process; and it is worthy of special remark, that where bog extensively abounds these abound also, and generally at a distance easily accessible, as if nature had placed them there for the

express purpose of being used in the reclamation of the waste land in question.

The clay and the sand are, for the most part, naturally mixed together; so that when we use the expression clay, practically we mean both clay and sand; and whether in the best proportion or otherwise, it may be advisable in the first place to apply them as they are, in quantity to suit the peculiar circumstances of the case, the effect produced being the practical rule of guidance, which will greatly depend upon their successful incorporation with the peaty staple. Thus, if they are thoroughly incorporated with the natural staple, the effect in harvest will be greater than were they to be applied in lumps requiring the action of the weather for several successive summers and winters to break them down and blend them together so as to form a peaty loam, the sand and clay compost being no longer distinguishable from the original staple.

Small applications of clay will be more easily and perfectly incorporated by being suspended in water, the compost being applied in a liquid form, either on the principle of warping, or on the modern system of liquid-manuring by means of pipage, hydrants, hose, and jet. But when applied to the depth of several inches without an abundant supply of water, the work may be more cheaply done either by railway, or by the raising of subsoil clay by machinery, in accordance with the old-established practice of claying our fen-soils. Such being the difference of the preliminary data, each case may have to be its own rule in the outset. But if the success of future husbandry is to depend upon the artificial application of water to the land by means of pipage, hydrants, hose, and jet, the practical question naturally arises, Ought not such pipage to be effected in the outset, so as to apply the clay suspended in water, as above, and thus "hit two dogs with one bone" as it were?

That air and water are the parents, so to speak, of all fertilizers, alike mineral as organic, is a proposition too self-evident to admit of a practical demonstration; and there cannot be a doubt that it applies to peaty soils of the kind in question in a superlative degree. Such being the facts of the case, the laying down of pipes for the artificial watering and liquid-manuring of the land, and for the application of clay, sand, &c., is the next work in succession to that of drainage, roads, fences, and homesteads in the successful reclamation of peat-bogs to arable husbandry.

By means of pipes of the ordinary size used in liquid-manuring, and a plentiful supply of water, a very large mixing of clay could thus be applied to peat soils at any time, either by hose or jet, or on the principle of warping. In the former case, a larger number of hydrants than those commonly in use would be advisable, so as to reduce to a minimum the heavy tear and wear upon the hose that must obviously be experienced. But in examples of comparatively level land, if a short metal pipe a foot or so above ground were fixed on to the ordinary hydrants, and the land prepared in the usual way for warping, then one or more, or perhaps the whole of the hydrants may be opened and allowed to flow together, the thick, muddy liquid having a head of sufficient altitude and pressure to give it a rapid and scouring velocity, until the open, loose, and porous texture of the peaty soil was thoroughly filled with the clayey warp, the whole field being literally in a sea of mud, sub-divided somewhat similar to rice fields on grounds possessing a gentle declivity. The clay prior to application could be ground in mills analogous to the common process in operation in most brick-fields, the runner either being worked by a horse or by steam-power; or different kinds of mills actuated by steam could easily be made expressly for the purpose. And on shutting off or stopping the flow of the muddy current through the pipes, water may be thrown in for a short time to wash them out clean, and thus prevent the pipes from being silted up. The object of screwing on a short vertical discharge-pipe to the hydrant is to prevent any back-flow of warp into the pipes at the close of the operation of warping.

As soon as one field was finished in this manner, the muddy liquid could be turned on to another, until the whole area of peat bog under reclamation was gone over for the first time, supposing it to have been subdivided into a number of farms in the work of drainage, &c.

Other operations would follow. Thus, when the water in the first warped field was drained off, partly by the drains below, and partly by evaporation above, and when the soil

was reduced to what is termed "between the wet and the dry," a large grubber or cultivator, actuated by steam, could then be yoked, and the clay thus thoroughly mixed with the peaty staple, the new staple thus formed being, at the same time, effectually aerated, so as to promote those chemical changes and fertilizing processes that immediately take place in newly formed loamy soils of this kind. And if it was found that the first dose of sandy clay was inadequate to produce such effect, a second dose could be applied, and so on for the rest of the fields included in the undertaking.

As to the sources from which the clay and the water would be obtained, no general rule can be given that would apply alike to all cases. Almost all our large bogs would have to be surrounded with an intercepting drain or open cut; while new cuts, at higher levels, would flow through not a few examples; so that, in the majority of cases, there would be a supply of water at more points than one; and if clay cannot be got at them for grinding and mixing, it could always be brought to them by temporary railways in any quantity. Where the clay may be had in abundance from the subsoil, thus forming large ponds, it may be advisable to have a large pond at each farm homestead for the purpose of collecting rain water in rainy weather, and out of which to supply the fields in the time of drought artificially with water, by means of the pipes, hose, and jet. Under such conditions, the facts of each case naturally suggest its own practical rule. And in those cases where clay cannot be got from under the moss at the homestead, then water will have to be brought to the homestead in pipes; and through these pipes the clay may be conveyed in suspension. Thus various plans may be practically carried out into operation, according to the peculiar circumstances of different examples. One more may be specified. In large undertakings, pipes for applying the clay and water may be temporarily laid for the purpose on the surface of the newly-drained and ploughed bog land; or a main pipe only could be thus laid along the road between the different farms on each side, so as to supply the liquid manure and water pipes of each farm with warp from a common source, situated at a distance, where there was an abundant supply of clay and water at command of the proper quality. These main pipes could be made of a form so as to be readily screwed together and unscrewed, when to be removed to another place for claying a second and third series of farms, and so on, until the whole bog was finished. In the formation of roads and fences, and the conveyance of materials for draining and building houses, single lines of temporary railways would be advisable on the score of economy; and these temporary lines of railway could remain until the land was clayed and brought under aration, so that the main pipes for claying could be laid down alongside these railways, and also be removed again, at very little expense apart from the expense of the railways and main pipes themselves. And to a contractor or landowner both these would possess a certain value for similar jobs, at the conclusion of the work of reclamation, so that a small amount of tear-and-wear per acre is all that would have to be set down against the newly-reclaimed land. What that outlay per acre for tear-and-wear of railways and main pipes may be, will depend upon circumstances, which of course cannot be supplied in a general notice of this kind. But in the most expensive cases it may safely be set down as fractional, and certainly no bug-bear to frighten any landowner or contractor, for it is manifest that the returns from improvements thus effected will yield ample interest on the capital permanently invested.

The mixture of clay, sand, and water with the natural bog-staple may not be sufficient to produce the desired fertilizing changes without at the same time a suitable dose of lime and manure; consequently these will have to be applied by the landowner before his bog-farms can be said to be in a crop-bearing and tenantable state. But into details of this kind we need not enter.

From these general and desultory observations it will readily be seen by the practical reader that the progress of steam in the various operations of farming offer many facilities at the present time for the reclamation of our peat bogs, that were not at the command of landowners and contractors a short period back. It is therefore the bounden duty of all landowners who possess large tracts of peat bogs to shake up themselves and think anew, in order to see what can be done in the matter to

their advantage. The steam plough and other cultivators are modern appliances which would enable some bogs to be cultivated long before they would carry the feet of horses or neat cattle. And when we add to these seed and manure drills, also actuated by a wire rope, the boom to both landowner and those entering upon the tenantry of newly-drained bogs is not very easily estimated at its practical value. It is, however, when an enlightened view of the whole appliances of modern

times is taken, that the work of reclaiming our extensive bogs, Irish, English, and Scotch, appears in its true light; and were it thus seen by those more immediately interested, the bleak and barren regions of bog that have so long disfigured the face of the country would soon, under the effective operation of such appliances, be converted into fertile fields and well-stocked farms, supporting an increasing and prosperous population.

THE LONDON AND PARISIAN MODES OF TREATING TOWN SEWAGE. ITS UTILIZATION.

It seems to be the fate of what really is an important question connected with agriculture, namely, the treatment of our town sewage, to be subjected to a perpetual ebb and flow of public opinion. Like some floating matter on the verge of the sea shore, it is impelled onwards to the edge by the flowing, and then taken back to the depths by the receding sea; it is always in motion, yet never gets nearer what to one would seem to be its final destination. The movement of to-day was prefigured by that of yesterday, and that of to-morrow will be characterized by all the features of what may be paradoxically called its stationary motions. Our town sewage question is indeed a vexed one; while all are agreed as to the importance of its claims, a remarkable diversity of opinion exists as to the mode by which those claims are to be met. One extreme view is that town sewage is available in every case, the opposite being, we need scarcely add, that it is available in very few, if, indeed, as some are inclined to maintain, in any case connected with the practice of agriculture. In this, as in other questions, the middle course is the safest one to pursue. When we look to what has been done in this country during the last twenty years, and on the continent for centuries, in the utilization of the refuse of our towns, surely it is going too far to say that it is not and cannot be made to some extent available in the practice of agriculture. Difficulties, and those of no ordinary or easily overcome kind, assuredly are met with; but it is questionable how far these owe their existence to the inherent nature of the system of utilization, or arise from the way in which this utilization has been attempted to be carried out. But granting the number and portentous nature of these difficulties, we can see nothing in them to prevent their being overcome by the combined exercise of the chemical and mechanical skill which in other departments have done so much to raise our country in the ranks of civilized nations. We have in other matters bought our present position at a costly rate; every step has been gained by a large expenditure, and those steps have not always been made in the forward direction, the one made to-day showing only the false one taken yesterday—not less must we expect our progress to be effected with a large expenditure of time and money in this same matter of our town sewage. The question is assuredly one worth settling, and settling well; for it possesses a double interest to all of us, in town a sanitary and in country an agricultural interest. And we think that these interests are not incompatible, nay, that they are compatible in the widest and highest sense. The commonest things around us tell us of change and decay, but science teaches us that there is no such thing as loss of matter; the decay of one thing gives life to another; the refuse of to-day gives us the food of to-morrow; and it is but the working of a natural law which gave, as has been finely expressed, to the snowdrops and violets which covered the heights of Alna, and bespread the fields of Balaklava, all the richer colour, and all the sweeter fragrance, from the rich life-blood which, so to speak, watered their roots.

The subject then, is one of high natural interest, of importance to dwellers in towns as well as to those who reside in the country, and is worthy of being kept in view till speculation shall give rise to realization.

The two modes by which town sewage is proposed, at the present time, to be made available for the purposes of agriculture, may be typified by those which are carried out in London and Paris. These we may designate respectively as the "water drain" and the "cesspool system." Let us briefly glance at the

peculiarities of these two systems. The London, and which is fast becoming the provincial system also, is to arrange a system of tubular drains in connection with the houses and the main sewers, by which and through which the fecal refuse of the houses is led off at once by the vehicle of water, the ultimate place of destination being the river or stream adjacent to the town or village which requires to be drained. If the principle of speedy removal is the correct one, if getting rid as quickly as possible of the fecal matter of our houses is "the be-all and end-all" of the matter, there can be no doubt, or at all events but little doubt of the efficacy of this water-conveyance plan. But it assuredly, however perfect in one point of view, gives rise, so say some, to grave imperfections in another and not less important one. But, indeed, this perfectness in the one point referred to is really not attained; for it is far from securing, as its out-and-out advocates say it does, the full sanitary requirements of the towns. If the system of water-conveyance removes the nuisance quickly from the one neighbourhood, it as quickly conveys it to another—it is but a shifting of the evil. For the accumulated products of many localities, given up in all the fierceness of their filth to the rivers or streams, rapidly bring these into a condition little better than that of open sewers, thus creating in an extended way what in a minor system is intended to prevent. But this shifting of the evil involves a moral point, which Mr. Page, the well-known engineer, thus very forcibly puts: "If we are bound to remove a nuisance from ourselves, we are morally bound to consider the consequence of transferring it to others." As a rapid conveyor of the fecal matter from our houses to, no matter where, the water-drain system of conveyance may be pronounced pretty perfect; but, as above stated, if perfect in this way, it gives rise to great imperfections with difficulties in another, and this in an agricultural way. For it so happens that the medium which acts as a rapid conveyor of the sewage—namely, water—acts unfortunately as a rapid diluter of it, lessening its value as a fertilizer, bring about the very difficulty which renders so apparently hopeless the realization of any scheme for utilizing, on a grand scale, our town sewage. We are not forgetful of the argument that the abundance of the watery element in the town sewage is so far in favour of any plan for carrying it into the country, at a distance from the town where it is produced, inasmuch as from its extreme mobility, and the cheapness with which steam-power can be applied to aid this, a large amount of fertilizing matter can be obtained at as cheap a rate, if not cheaper, in this form, than in that of any other. Refraining, however, in the meantime from going into the estimates by which this opinion is upheld—which, by the way, are doubtful enough, in point of accuracy—it is sufficient for us here to point to what may be considered as axiomatic, that the more concentrated a manure is, the cheaper it will be to the farmer; this consideration gaining force the further his farm is situated from the place in which the manure is produced or sold. By the plan of water-carriage, whatever may be its advantages in quickly conveying manure, very quickly deteriorates its fertilizing value, a per-centage of the cost of conveyance is taken up in conveying water, so that while the farmer is paying for one thing he finds that he is obtaining another. True, it appears that according to Board of Health estimates (not always correct), while one ton of solid manure can be conveyed a certain distance for 15s., for the same money 75 tons of liquid town-sewage can be conveyed the same distance. It is not stated, however, whether the 75 tons of town-sewage is worth the one

ton of solid sewage—an important point, and not to be passed lightly over. Thus Mr. Lawes, in the celebrated discussion at the Society of Arts some years ago, had the following: “If the 75 tons of sewage, so delivered to him for 15s. were to be in the state of dilution, which existing facts led him to think it would probably be, it would contain only about $\frac{1}{2}$ of the average annual excrements of one person, which, allowing liberally, he had valued in the solid form at 6s.; and however ardent an admirer Mr. Mechi might be of water, he would perhaps agree with him (Mr. Lawes) that the extra cost of 9s. or 10s. would be paying rather dear for the solution of 5s. or 6s. worth of manure.” We know that the valuation of Mr. Lawes as to the worth of the sewage is considered by the advocates of the water-system as below the truth; but even when giving a much higher margin the loss from dilution is evident enough.

The difficulties, however, of the diluted system being so apparent, it has been attempted to utilize the solid matters of town sewage only. However feasible this scheme appears at first sight, it is in reality surrounded with difficulties which hitherto have been found insurmountable. In the first place, it seems conceded on all hands nearly that the chief fertilising materials of town sewage remain in solution, and that the solid matters extracted from it, however bulky, and in this sense valuable to a certain extent as a manure, are in reality of little fertilizing value. The result of all trials may be named in that of a series instituted by Messrs. Iloffman and Witt, from which it appears that “six-sevenths of all the fertilizing constituents are in the soluble form, and that in the liquid which results from the deodorizing processes...a very considerable proportion of the soluble agents of the original sewage remain unremoved.” On this point another authority says: “In fact, so small is the amount of valuable manurial constituents shown to be contained in such solid sewage manures, that they could only be useful if applied to the land in several times as many tons per acre as would be required in hundredweights of guano or the *pure dry excrement*. It is obvious that such a manure would, on account of the cost of carriage, command no price at all beyond a very limited distance from its place of manufacture.” This last sentence in point of fact, contains a comprehensive statement of the other difficulty attendant upon the use of the solid parts of sewage as a manure. While glancing at the use of sewage in its normal or liquid form, we pointed out the advantages of concentration in a manure, and the loss sustained by the non-concentration in the liquid sewage: this loss is, however, still greater in the use of the solid parts of sewage. Investigations undertaken in connection with the use of the solid sewage—obtained by treating the liquid with lime (by far the best process yet introduced)—show that beyond a certain limit of distance from the manufactory in which the solid manure is made, its use would not pay for the carriage; and that, seeing that six times as much of the solid sewage would be required to fertilize a given space of land, as of guano, it would be the cheapest mode to use guano even in the neighbourhood of the works where the solid sewage is made. At a distance of five and ten miles from the manufactory the cost of carriage would be *six times as much* as of the quantity of guano required to produce the same effect. At a distance of fifteen miles, while guano costs, in carriage and spreading, £11 15s. 9d., the quantity of the solid lime sewage required costs £15 14s. 6d. At a distance of twenty and twenty-five miles, the costs stand respectively thus—guano, £12 0s. 9d., £12 5s. 9d., and the solid sewage, £17 4s. 6d. and £18 14s. 6d.

Such, then, may be taken as a rapid glance at the present position of the “London” system of the tubular or drain sewage system, and of the difficulties which it inaugurates at the very threshold of any plan by which it is proposed to utilize its products for the purposes of agriculture. It is not here our purpose to show how or what means have been proposed to obviate these difficulties; suffice it to say that at present they are considered so very difficult to be overcome that many who have given their attention to the subject seem to think that it will be better, and in the long run cheaper to do away with the system altogether by which these difficulties are created, and to inaugurate a new one which will present none of them, but which will on the contrary, give us the fecal refuse of our town population in that highly concentrated form which will be best adapted to the purposes of the farm, and which will give, in its

ready sale, an ample return for the expense of collecting it. It will perhaps startle some of our readers that the type of this new system is the “cesspool system” of Paris: of course this is to be modified and brought more in accordance with the sanitary and chemical requirements of the day. So long have we been accustomed to consider our tubular water sewage system to be correct in principle, and the only practical way in which our town sewage can be disposed of; and to such dire recitals of the horrors of cesspools have we been treated by Boards of Health and sanitary savans, that any proposal to leave the tubular and return to the cesspool system may well be met with considerable wonder. We have said that the *type* of this new (and by many dabblers deemed heretical) system, is to be met with in the Paris system of treating fecal refuse, let us glance then very briefly at what this system is. As a rule, the fecal matter is not diluted with such quantities of liquid as with us. Those who have visited Paris, and walked observantly along its pavements, must have noticed in many districts the multiplicity of iron gutters or open channels which cross there and lead to side-gutters. These are laid down to lead off the greater portion of the water resulting from cooking and cleansing operations of the household, the ultimate place of deposit being the sewers which communicate with the river Seine passing through Paris. All the dry refuse which with us is placed in the ash-pit—and much in the water-closet—is taken out and deposited in the streets at midnight, from whence it is taken at an early hour by scavengers. These heaps of refuse give occupation to a whole army of *chiffonniers*, who turn them over to collect the rags, &c., &c., which are mixed up with them, and the selling of which constitutes their sole means of existence. The result of these two arrangements is that little is left of the house refuse to mix with the fecal refuse, save the slops of the bedroom; so that the matter is left in a much more concentrated form than with our system of tubular drainage. The Parisian houses are generally very liberally supplied with water-closets or “cabinets”—indeed, in large houses, each floor is generally supplied with one. The pungent odour, which as some of our readers doubtless have been hailed with on their entrance to a Parisian cabinet, gives evidence at once that there is a peculiarity connected with its management foreign to the London system with its stench traps and liberal supply of water. The cabinet consists usually of an earthenware basin, communicating directly with the pipe which leads the matter to the cesspool below—the opening to which in the better class of houses is generally, but in the lower classes rarely, “trapped.” The trap consists of a moveable lid or flap, which seldom fits closely. As water is laid permanently on to comparatively few houses, the supply is obtained from a pitcher or vessel which is generally found to have a place in the corner of every cabinet, its neighbour implements being a long stick and a broom, by the use of which the action of the water in cleaning out the basin is aided, and its use economised. It is scarcely necessary to say, that such being the arrangements to secure a rapid cleansing of and carrying away of the contents of the basin, they are as seldom as possible put in force, a thousand excuses, many of which will be obvious enough on the slightest consideration, being made for not keeping a supply of water, and giving the necessary care.

The matter from the cabinet is led off at once to the cesspool by the pipe. The cesspools of Paris may be divided into two classes, the “permanent” and the “moveable.” The permanent, it is almost needless to say, are excavations made in the ground, and are often, especially if of old construction, found to be very defective, allowing a large portion of the contents to percolate through the surrounding material. The moveable cesspools often consist of simple barrels, which hold the solid and liquid matters combined; but in other and improved arrangements, an apparatus is used by which the liquid portion is drained off, leaving the solid in a receptacle capable of removal. It is not here our intention to describe the means by which the permanent cesspools are emptied of their contents, or how the moveable cesspools are conveyed from the premises, these operations being conducted on a somewhat gigantic scale by public companies provided with appliances more or less complicated: we propose to describe only, and that very briefly, the method by which the contents of the cesspools are, on the large scale, made into a form easily available as a manure. The fecal matter is taken to one of the *voivres* in the neighbourhood of Paris, either to that at Montfaucon or

to that at the Forest of Bondy. The process of preparing the manure is at once slow and anything but savoury in its details. A number of basins are placed in communication with one another. To the upper ones of these the fecal matter is supplied, the liquid draining off into the lower ones, leaving the solid portion in the upper. After the lapse of many months, this solid portion assumes a consistency of half-liquid mud. By cutting channels across the mass it is further relieved of its liquid; and when considered dry enough, it is removed to the drying-ground, where it is broken up by a process of harrowing. It is then placed in large heaps, and allowed to remain thus for a considerable time. Large portions are then dug out from the heaps, broken up into pieces, and carefully freed from all foreign substances. It now assumes the form and name of *poudrette*—a substance which has the appearance of “a mould of a grey-bluish colour, greasy to the touch, finely grained, and giving out a particular faint and nauseous odour.” Notwithstanding the long exposure to atmospheric influences the materials of which *poudrette* is subjected to, it possesses a comparatively high manurial value. Thus M. Paudet, in his work, “Theory and Practice of Manuring,” gives the following table, from which will be seen its value. Taking for a standard good farm-yard dung, which in every 1,000 parts, 4 of nitrogen, and assuming that 10,000 kilogrammes of farm-yard manure are required for a hectare of land, the quantities of *poudrette*, and of some other animal manures required to produce a like effect, would be as follows:—

	Kilos.
Human urine, not fermented	5,600
Poudrette of Montfaucon	2,550
Human excreta, mixed	1,333
Liquid blood of the slaughter-house	1,333
Bones	650
Average of guano	512
Urine of the public urinals, fermented and partially dried	233

Such is, or was, the Parisian system of parting the town fecal matter, a system which, modified, some are now proposing to establish in this country. We say “was,” for, in the process of what may truly be called the re-building of Paris, undertaken by the present Emperor, the system above described is more or less modified; and an approach to the London system of tubular drainage is likely soon to be, if not already begun. The modifications alluded to have for their aim the storing up of the matter in a condition which will give rise to no unhealthy action, till it is required to be taken away, and to take it at once to the districts where it is required for agricultural purposes. We see from the above table the high value which human excreta, solid and liquid, have as manurial agents. One great object, then, in the new system proposed, is to maintain this high value as much as possible. To this end it is considered an indispensable feature of the plan that no water whatever should be allowed to mix with the excreta. This makes the proposed system, then, the very antipodes of the “tubular” drainage system, the very existence of which is dependent upon a liberal supply of water. Of course some plan, probably that of the tubular drains, must be used to take away from our houses the liquid resulting from cleansing and cooking processes. But this is quite a distinct matter, and has no connection with the treatment of the excreta of our population, which make up, in point of fact, the main manurial value of our town sewage; and to which, therefore, the agricultural interest more particularly belongs. The requirements of the new system cannot be better stated than in the words of Mr. W. B. Adams, who has given his attention to the subject. “As chemistry has been successful in converting filthy potato-oil and coal tar (see *Johnston's Chemistry of Common Life*) into delicate perfumes, it is no doubt chemically possible to convert all the waste material of a household into innocuous and not unpleasant circumstances. Two considerations are requisite; first, that it be cheaply done; secondly, that it may not diminish the value of the materials as a manure, by locking up, as it were, the ingredients so firmly as to render them insoluble in the ground for the purposes of vegetation. To accomplish this is the business of the chemists. If the same skill and energy be put to work that has accomplished the conversion of other noxious substances into perfumes we shall not be long at a loss.” But the mechanical requirements are still to be met. The following is Mr. Adams's views on this point: “To use the disinfectants we need portable cesspools without the access of water

as in the ordinary plan of closet, in which cesspool or vessel the disinfectant may lie. It should be a vessel upon wheels at a level with the yard of the house, and beneath the opening of closet or closets, with ample space, so that falling matter may certainly pass clear of the walls. These cesspools should be furnished by companies, who would take them with their contents to discharge into the covered railway-waggons or barges and replace them with empties. In this mode the material, undiluted with water, would be transported cheaply, and be as readily saleable as guano.” We may here note, in passing, that the mode of saving and treating excreta introduced by the Rev. Mr. Moule is one of the most recent, and bids fair to be one of the most successful of the plans under this class.

In these few remarks which we have in the present paper given, on a very important subject, closely concerning agriculturists, we have placed before the reader a brief statement as to the position which the question of the treatment of the fecal refuse of our towns at present stands. The whole presents points which are well worthy of being discussed calmly. It is one of the features of an enlightened and liberal mode of treating scientific subjects, that the theories or opinions allowed by those who differ with us are received courteously, and their claim to notice quietly investigated. This is not only a pleasant mode but it is also good policy for securing them the fulness of investigation with the utmost freedom in discussion; thus the main object with all of us, the best and quickest settlement of the question, is greatly aided. However viewed, the question naturally divides itself into two grand classes, the town and the country interests. The town or the sanitary interests are quite distinct, or at least should be, from those of the country or agricultural ones. The primary duty of the town is to see that the sanitary requirements should be met, and in this best possible way, whatever be the cost. They have no other point to consider—we speak advisedly—but this: all other considerations are merely secondary ones. The duty of all corporations is to free the inhabitants from a nuisance; and they have as little right to grumble at not being paid to do this, as they would have to grumble at the expense of protecting the community from thieves. The dealing with the nuisance is their primary duty; a secondary consideration merely is that which takes into account the mode of making that nuisance pay the expenses of its own removal. As for agriculturists, all that they have to concern themselves with is this, namely, to see to the value of such manurial substances as may be offered them, to put the matter, in fact, upon a strictly commercial basis. It is assuredly their interest to use materials which will pay, and if they are not so used, the towns may rely on it that their value is not sufficiently high to induce their usage. But it is mere absurdity on the part of some to continually indulge in wrath as to the folly of agriculturists in bringing guano from long distances, and resolutely wasting materials nearly as valuable lying at their own doors. This, so far as town sewage is concerned, is all nonsense; agriculturists have no right of interference with town arrangements. The whole matter must of necessity become liable to the action of the laws of supply and demand which regulate the other departments of our industries. In ordinary transactions the seller takes the material to the buyer, or who is likely to become one, or at all events he makes some arrangements by which the buyer can obtain his wares; and, if the seller does not or will not undertake these preliminaries, he has no right, we conceive, to grumble at the non-disposal of his goods. Just so with this matter of the final disposition of the fecal matter of our towns, so far as these towns and the agriculturists are concerned. If the corporation really have a valuable material to sell which it would pay to take or to allow to be taken into rural districts for manuring purposes, it is clearly their interest to do so; and it is as clearly the interest of the agriculturist to avail himself of this supply. That this has not yet been done is a proof, we think, that the value of the materials the towns have to offer is not high enough; it is no proof that the agriculturists are blindly indifferent to it. If it is worth buying, it is at all events worth offering. That it has not been so is evident enough, and it remains to be seen how far the modified Parisian system, which we have actually discarded, is likely to present facilities by which the value of our town excreta can be raised to the paying point. We have opened up many points, the further and occasional consideration of which may hereafter elicit points of value to our readers. R. S. B.

BLOOD-LETTING AND PURGATIVES,

THEIR IMPROPER APPLICATION IN HORSES, CATTLE, SHEEP, AND OTHER ANIMALS.

By HUGH FERGUSON, Her Majesty's Veterinary Surgeon in Ireland.

I am fully aware of the great difficulty in rendering such a subject intelligible to the mass of general readers, or to any others than those who have received a medical education; but when I take into consideration my firm belief that far more animals have been killed by blood-letting and the injudicious administration of purgative medicines than have ever been saved by their most judicious application, I think it not an unworthy, though, it must be admitted, a very difficult task, to endeavour to impart, in a popular form, as much information as will lead to the correction of the prevailing errors on so important a point in the treatment of animals, either as a curative measure, a preventive of disease, or as a means of rendering them more healthy, more vigorous, and more disposed to assimilate to their frames, through the medium of their digestive organs, the nutriment taken for their support.

Although blood-letting has been advocated, from time immemorial, for the accomplishment of these purposes, for the great majority of them it is—in fact, for all but one—as a general rule, worse than useless, being absolutely injurious. Yet it is with horsemen, farriers, cattle-proprietors, herds, and, to a great extent, even among veterinary-surgeons, a time-honoured custom that has still its strenuous advocates, notwithstanding its being opposed to every principle of common-sense, and to all rational deductions from experience. The only purpose for which blood-letting is admissible is as a curative measure. It should be held as an axiom that *it is quite time enough to abstract blood when doing so has become necessary from the presence of disease*. I wish it to be also understood that even the presence of disease ought not to warrant "blood-letting" as a remedy, without its being first taken into consideration whether or not the disease is of that particular nature that is likely to be benefited by the operation; for although an inflammatory action may be its very essence, it may be one for which the loss of blood would be injurious.

Even in acute diseases, whether blood-letting is indicated or not will depend on the part—the tissue or organ—that is suffering from the inflammatory attack; also on the character or type of the malady. For instance, blood-letting is injurious if the nature of the disease be typhoid, very depressing to the powers of life, shows great debility of the nervous system, a languor in the minute ramifications of the circulating vessels, or a tendency in the fluids, and those structures in which they predominate, to putrefaction. These form prominent characteristics in many epizootical (generally called epidemical) affections, such as influenza and distemper in horses, typhus in cattle, and the disease at present committing such fearful ravages among the sheep, particularly breeding-ewes, of this country. In this latter affection, so great is the tendency to decomposition, that in inveterate cases it seems absolutely to commence even before the extinction of life, and it is almost an impossibility to cure or save the meat of such animals, no matter how carefully salted, or however early in the affection they may be slaughtered, for the purpose of converting them into food, as is frequently attempted.

In this sheep disease the vital force which endows the living frame, in a healthy condition, with the power to resist ordinary chemical actions between its constituents, becomes enfeebled from the imbalances and privations to which the animals were exposed during the past winter. Thence arises the putrefactive tendency. The ewes, being the least able to resist these prostrating influences, suffer the most. In this disease the blood, as a supporter of life, becomes deteriorated in quality, and the animals die from it being unable to efficiently fulfil its various functions. In many cases the *post mortem* examinations show, according to generally received notions of pathology, no sufficient amount of disease in any particular organ, to account for a fatal termination; although when the deterioration of that vital power, which in the healthy animal resists chemical decomposition, is considered (which is most

evident from the state of the tissues even when an animal is killed before the disease has run its natural course), there is recognised quite sufficient to explain the cause of death, without seeking it in any particular organ, although in many cases serous effusions are found in the chest, abdomen, and brain, and sanguineous ones within the structure of the lungs and other organs, causing, along with the general tendency to decomposition, a softened destruction of their tissues.

This peculiarly diseased state of the system is the very reverse of any of the active inflammatory ones in which blood-letting is admissible. No excess of vascular action can be discerned at any period of the disease. If the pulsations of the heart are increased in their rapidity, their force is found greatly enfeebled. Let such a state of disease be called what it may, it certainly is different in every respect from active inflammatory action. Yet, blood-letting has been recommended, and is by many practised for it as a remedy. The operation but accelerates death. It is blood of a better quality, and more of it, that is required; and this cannot be accomplished by diminishing the quantity of the already too impoverished fluid circulating through the debilitated and fast decaying system of the affected animal. Such a procedure but confirms the putrefactive tendency. I have more fully alluded to this sheep malady than to any other disease of the many to which almost similar observations would be applicable, in consequence of its being one which is very prevalent at present in the west of Ireland, and which offers a striking example of a type of diseased action in which blood-letting is contra-indicated, as well as from its also being one the nature of which, I conceive, is misunderstood.

I trust I shall shortly be enabled, through the medium of Professor Cameron's assistance, to present a chemical analysis of the blood as affected in this malady, compared with that fluid in the healthy animal. I feel assured that in studying the diseases of animals, what I call pathological chemistry has hitherto been too much neglected, and that its proper cultivation cannot otherwise than lead to most important and practically valuable results. Chemistry has done much in the practice of medicine towards alleviating human suffering. I am of opinion it is capable of doing still much more for the brute creation.

Many horse-proprietors and stock-owners are in the habit of having their animals bled periodically, some once, others twice a year, as a sanitary measure, either for the prevention of disease or from the erroneous notion that loss of blood is conducive to muscular vigour and a tendency to a more profitable assimilation of the food into flesh and other tissues. Though this custom seems to have the sanction of long established usage, nothing could be more opposed to reason and all known principles of physiology. As well might a pugilist be bled with the view of developing his physical force and endurance to the utmost for an approaching prize-fight, or recruits bled previously to the commencement of their drill, or the more veteran soldiers lose a portion of their vital fluid with the view of enabling them the better to endure the fatigues of a campaign, as to bleed horses for the purpose of getting them into that state of condition necessary for severe work, or to bleed cattle as a sanitary measure, as a preventive of disease, or for the purpose of increasing their "thriving" or fattening tendencies. Yet, the malpractice is one of extensive and every-day occurrence.

When, from an attack of a disease indicating the advisability of blood-letting in an animal that has been subjected to repeated loss of blood as a sanitary measure, recourse is had to the operation, its efficacy will be found greatly lessened from the constitution having become habituated to periodical losses of blood. Blood-letting has been strenuously advocated as a preventive measure, particularly against epidemic, epizootic, infectious, and contagious diseases. The loss of blood under

such circumstances has quite a contrary effect to the one desired. The tendency to absorb from the surrounding medium is greatly increased. Many animals that would escape the poisonous influence had they not been bled become affected; their systems, previously debilitated from loss of blood, too often succumbing to the disease, the accession of which, in many instances, might be avoided by refraining from the use of the lancet. For I state it as a positive fact, the result of much observation, experience, and study, that blood-letting, instead of preventing the attack of these diseases, but predisposes the animals to become affected by the peculiar influences which produce them, whether epidemical, endemical, infectious, or contagious. Before entering further into the question, it is desirable to give some information as to the effects produced by loss of blood on the animal system; to understand which, they should be studied as produced on animals in such a state that there is no other influence in operation to affect the phenomena. To do this, the study must be made on animals in a perfectly healthy state; for the effects of blood-letting are greatly modified by the presence of some diseases—they are widely different in some diseases from what they are in others. In some, the loss of blood, if not pushed too far, and yet to a sufficient extent, increases the chances of life's being prolonged by the operation; while in others, blood-letting but accelerates, if it do not actually cause a fatal termination to the malady. If blood be abstracted from a healthy animal to a sufficient extent to produce an immediate and remarkable impression, a tendency to fainting, or that phenomenon fully developed, is the effect produced. The animal evinces signs of distress, the respiration is increased, the eye becomes languid, its stare vacant; the pulse, at first rapid and full, becomes weak, thready, and irregular, then imperceptible; the frame trembles; the limbs totter if the animal is moved; they at last become unable to support the superincumbent frame, and the animal falls down insensible; in fact, he faints. Fainting from loss of blood is a wise provision of nature. It is the result of not enough blood's going to the brain. During the faint, the circulation of the blood seems partially suspended, and the wounded vessels have time to contract, as well as the blood at their opened parts to coagulate and plug up their bleeding orifices, thus preventing bleeding to death—a wonderful provision of Providence. A soldier on a battle field receives a wound dividing some large vessels; with every pulsation of the heart the blood is squirted out in jets; the brain receives an insufficient quantity of the vital fluid; the heart almost entirely ceases to act; the wounded man faints; and well for him he does, for, during the suspension of the circulation, the blood coagulates in the vessels where they have been wounded, forming a plug that prevents the recurrence of the hæmorrhage on the heart's resuming its proper functions. 'Tis thus the fainting of the wounded, whether man or brute, so often prevents "bleeding to death."

The recovery, or, as a sailor would say, the "righting," of the system from loss of blood is generally called "*reaction*," which varies in its character according to circumstances. Sometimes the animal sinks, instead of recovers, dying from the loss of blood. On a knowledge of reaction depends a person's being able to properly understand the effects, application, and misapplication of blood-letting. Therefore, although the subject may not be amusing to the general reader, it is one a knowledge of which is indispensable, before anything like correct notions can be obtained as to the application of blood-letting as a remedial measure either in brute or human medicine. The varieties of reaction not being properly understood has caused a greater amount of lives being lost, both in man and the domestic animals, from blood-letting, than has ever been saved by even its most judicious application. There is a state of the system frequently brought about by blood-letting so closely resembling inflammatory action that it is treated as such. Repetitions of the blood-letting is had recourse to, under the mistaken idea of subduing what is erroneously thought to be an inflammation. The symptoms get worse instead of better, the letting of blood is persevered in, and the animal dies—not from any inflammatory action, but from excessive reaction, caused absolutely by mere loss of blood. This state can be induced, even in the healthy animal, by repeatedly abstracting small quantities of blood from the system. It is the true cause of the great mortality among animals treated by the "blood-letting practitioners." A horse is found to be unwell, dull, a little off his feed, and, perhaps,

giving an occasional cough. On examination, the pulse is found not increased in number, yet the animal, to use a stable term, is evidently "amiss." It is thought the loss of some blood will soon make him all right; four, five, or six quarts are abstracted from his jugular. On the next morning the animal is found worse instead of better; his pulse has increased in number instead of diminished, his breathing is quicker, and he is more uneasy. It is then thought that there has not been sufficient blood taken to arrest the inflammation—that if more had been abstracted the attack would have been cut short; or, as many of the energetically spoken would say, "knocked on the head." Under this impression the horse is again bled, but with no happier result. The symptoms become aggravated; the breathing more laborious; the pulse much quicker, perhaps jerking; great uneasiness is evinced, and it is decided to "take a little more blood." Still the symptoms present no amelioration. The pulsations become more numerous within a given time; the arteries seem to bound beneath the finger; many of them, the small ones in which no pulsation could be heard before, now show it most distinctly; the action of the heart becomes throbbing, sometimes tremulous, often irregular; the animal blows like a pair of quickly-worked bellows in his breathing; and although these symptoms are caused by loss of blood, yet there is an increase of temperature; the superficial vessels of the head are turgid, and the mucous membranes within the eyelids and the nose are injected, leading the generality of observers to imagine that the system was suffering from an active inflammatory attack, for which blood-letting was necessary for its subjugation. Such cases either suddenly sink, or the reaction continues increasing until it eventually completely exhausts the vital powers, and the animal falls a victim to the injudicious application of the very means that had been adopted to save him. I have seen in my professional career some thousands of horses sacrificed in this manner, by excessive reaction resulting from loss of blood being mistaken for an inflammatory affection requiring a repetition of blood-letting. Previously to death, in such cases, the animal shows unmistakable symptoms of what is thought to be bronchitis. The air tubes and cells of the lungs fill with mucus, which assists, by its suffocative tendency, in the destruction of life.

Sometimes after blood-letting there is induced a state diametrically opposed to that just described as "excessive reaction." It may, therefore, be called "defective reaction." The pulse, although increased in number, is so feeble that it can scarcely be felt beneath the finger. The beating of the heart is of the same character: they are both sometimes irregular. The animal droops his head, hangs the under-lip, and is cold on the surface, particularly of the ears and limbs. The breathing is oppressed in character, as well as accelerated. The lungs are evidently affected: their air-cells and passages cannot get rid of the mucus that is secreted into them; there is much restlessness and general distress; the fore-legs are held far apart; the gait, if movement is attempted, is tottering: at last the limbs refuse to support the frame, the animal falls, often in attempting to lie down, and, if a horse, quickly dies. Such are the symptoms of an animal's dying from loss of blood, where the reaction has been insufficient for the effectual rallying of the system. It is thus animals die from the effects of blood-letting, when it has been improperly prescribed as a curative measure in those diseases of a depressing nature, as far as regards nervous influence and the general circulation, such as influenza and distemper in horses, typhus in cattle, and most sheep diseases.

Having alluded to the two kinds of reaction following loss of blood which are inimical to life, allusion is necessary to that amount or state of reaction which is the most desirable, and the best calculated for the establishment of health, or the animal's recovery from the effects of loss of blood. In my lectures, at the Royal Dublin Society, I was in the habit of designating it "simple reaction:" of late, however, I regard the term "healthy reaction" as more desirable. I shall, to make it better understood, first consider it as seen in a healthy animal that has been bled to the extent of producing fainting. A description of its phenomena, as observed in cases of disease in the treatment of which blood-letting has been used as a remedy, must be postponed till those maladies come, in due course, under consideration. If the reaction be healthy, after the animal having been bled to the extent of fainting being produced, no peculiar symptoms indicating a deviation from health can be observed, excepting general weak-

ness, particularly of the muscular powers. There is scarcely any increased action of the heart or pulsation of the arteries. The vessels throughout the system quickly adapt their capacities to the diminished quantity of blood within them, and are again gradually distended with the vitalizing and nutrient fluid by the additions to its quantity received from the results of digestion and assimilation, which form blood out of matters apparently least like it, that are received into the stomach as food. Let it not be imagined that it is merely an increase in the quantity of the blood that is required to re-establish a healthy state of the system. The quantity of the nutrient fluid circulating throughout the frame must be brought up to the required standard of nutrient and nerve-stimulating power. Were it not so, the lost balance in the circulating fluid could soon be restored by the animal drinking even water, which would be quickly absorbed, and thus, in some measure, re-establish the balance as to quantity, but not as to quality.

Death from loss of blood may be either immediate or remote—immediate, when with the flowing of the vital fluid ebbs the tide of life, until death takes possession of the frail bark of mortality; remote, when any of the modifications of reaction or sinking intervene between the detraction of blood and the termination of life. It would appear that in dissolution, as in fainting, the brain is the first part the functions of which become deranged. For some time after the brain has ceased to act, it is observed that the beating of the heart and the circulation in the blood-vessels are kept up. In immediate death, consequent on the loss of blood, the first symptoms resemble those of approaching fainting. The animal sighs and becomes restless; the pulse increases in frequency, but diminishes in force; the respiratory movements become hurried, and perspiration exudes from the skin. If the head of the animal be kept in an elevated position he falls to the ground in a state of fainting, which in the horse is of short duration. When down, he struggles violently, the blood still flowing; the limbs quiver; the respiration becomes gasping; the eye is drawn into the orbit, forcing out the hair; and the abdominal muscles contract to expel the air out of the lungs, the last act of life being an expiration.

If, instead of holding the animal's head up while the blood is flowing, he is left at liberty, he staggers about, instinctively holding the head down, and spreading the legs apart from each other to keep himself from falling; but he at last falls with a tremendous force, surviving but a short time when down, and in dying evincing the same train of symptoms as those I have just described when the animal first faints, from the head being kept above the level of his body. There are many instances in which death has been extremely sudden from loss of blood. This most frequently happens when there is internal hæmorrhage, or when there has been much blood taken away on a previous occasion. Internal hæmorrhage in the horse more frequently results from ruptured liver, consequent on a diseased state of that organ, than from any other cause. Many horses have suddenly dropped dead before even an ounce of blood could be extracted from the jugular vein, which had been opened with a view of alleviating what was thought to be some highly acute inflammatory affection, requiring the detraction of blood.

The discovery of such an accident as ruptured liver cannot well escape those who take the trouble of examining the state of the membrane of the eye and inside nose, and inquiring into the previous history of the case. They are found to be of a yellowish-white colour, very pale. The ears and extremities are cold; the pulse of a very peculiar character, more easily remembered by those who have once observed it than to be described with accuracy, the character of the pulse being judged of by the organ of touch, the sensibility and education of which vary to an amazing extent in different individuals. The perusal of these observations may not be interesting or amusing to the cursory reader, but their study is absolutely necessary to understand that practical portion of the subject.

It is generally thought that where there is greatly increased action of the heart and pulse, in force as well as frequency, the case is one for which blood-letting is desirable. There are, however, many cases presenting those symptoms in which to take blood is but to diminish the chances of recovery. The number of the pulse and of respiration is by no means as infallible a criterion, as to the propriety either of abstracting blood or the contrary, as the generality of persons imagine. The apparently fevered state of the system may depend on cir-

cumstances for the combatting against which blood-letting would be most injudicious. For instance, if a horse is affected with gravel or stone in the bladder, he is likely to occasionally suffer excruciating agony. The entire system sympathises; the pulse augments in force and frequency, the breathing becomes accelerated, and the animal restless. Blood-letting would but debilitate, and render the frame less able to endure the suffering. It would not even diminish, let alone remove, the exciting cause of the mischief. One of the most familiar examples of great constitutional disturbance being induced, from sympathetic action in the horse, is where there is the formation of matter beneath the horn of the foot, whether resulting from the prick of a shoeing nail, or from some other wound, from a bruise, or from spontaneous suppuration, something like whitlow in the finger of a human being. The accumulating matter is pent up beneath the unyielding horn, causing such intense pain that the circulation and respiration become sympathetically affected, through the medium of the nervous system, presenting symptoms often mistaken for general inflammatory action, requiring blood-letting. In such affections the endurance to loss of blood is diminished, instead of increased.

The primary desideratum in medicine, whether brute or human, is to ascertain the cause of derangement. Too frequently effects are mistaken for, or confounded with, the causes which produce them. To distinguish between cause and effect is the grand keystone to the arch of medical science, and of, in fact, philosophy itself. Certain conditions of organs and tissues, and the circumstances under which they are relatively situated, often produce for their result a peculiar state of the system, very much resembling general inflammatory action, requiring blood-letting; but for which the measure would be injurious. The state of the animal in severe colic from indigestion is a striking example. A quantity of imperfectly digested food accumulates and becomes impacted in the intestines, sometimes in the stomach, causing great abdominal pain; the animal throws himself about his box or stall in agony; the pulse becomes rapid, at first strong and regular, though, as the disease advances, weak and irregular. If relief be not afforded, by getting the stomach and bowels to act and get rid of the offending matter, inflammation of the intestines will certainly set in, and most likely prove fatal. There is no inflammatory action in the first stage, notwithstanding the alarming symptoms of the increased pulse, rapid breathing, and frantic plungings. Bleeding in such cases is injurious. It but debilitates, rendering the constitution unable to hold out through the suffering. Even if absolute inflammation has commenced, it can be of no service unless the cause which has produced it be removed. The indigested accumulated mass within the intestines, the cause of mischief, must be removed, or all other remedies will be fruitless in beneficial effects. Remove the cause, and the effects which so much resemble acute inflammatory action will soon disappear. Of course, if before the removal of the offending undigested mass inflammation has been already established, the proper treatment for inflammation of the bowels must be adopted; but not before the stomach and intestines have been relieved from their obstruction. Much nicety is required in discriminating the difference between such cases and primary inflammation of the bowels. There are some cases of indigestion in many of which the stomach is found distended with a hardly impacted mass of food, just as it had been swallowed, in which derangement of the brain is so much the predominating symptom that the affection is frequently mistaken for inflammation or disease of that organ itself, instead of its functions being merely deranged from its sympathy with the stomach. Practitioners labouring under this mistake frequently bleed, and direct their treatment to the head, instead of the digestive organs. The result is death.

The treatment should be directed towards the stomach and intestines, with the view of inducing the expulsion of the accumulated mass of impacted food from the stomach through the bowels. Bleeding is most injudicious in such cases. The affection has been called, and not inappropriately, "stomach staggers." The animal at first shows symptoms of uneasiness; he is restless, continually pawing, looking round at his flank, and breathing quickly. The pain increases, he knocks himself about, the respiration becomes blowing, his eyes wild looking, he becomes unconscious, he forces his head blindly forwards against rack, manger, wall, or anything before him, as if his object were to push through them; the pupils of his eyes be-

come dilated, his breathing more prolonged and noisy; sometimes there are sudden starts of violence; at last he falls and dies. On opening him, the stomach is found distended with food nearly to bursting. The brain presents no appearance to account for the symptoms of its derangement evinced before death—symptoms which are too often mistaken for those of inflammation within the head, and treated accordingly, particularly by the abstraction of large quantities of blood; but in which blood-letting but accelerates the fatal termination. This affection is frequently met with in grass-feeding horses, used in slow draught—sometimes, however, in a different class of animal. Some years ago it caused the death of a most valuable thorough-bred sire in my possession, Cup-bearer. He managed one night to force open the door of his box, and get into the stable-yard, under a shed in which was the bean chest, its lid up. He got at the beans, of which he was very fond. He ate of them till he was satisfied, and having done so, it is presumed he went to the water tank, and drank plentifully. When found in the morning, and put back in his box, he seemed in excellent health and spirits, but in a short time afterwards was seized with colic. He became violent, then unconscious, and showed all those symptoms of derangement of the brain I have already described. I gave the remedies I thought desirable, but with little hope of saving life; for I observed a peculiar state of the tail, which was elevated and quivering, that led me to suspect he had ruptured either the stomach or some of the intestines. My surmise proved to be correct. He died.

On opening him, the stomach was found enormously distended with food, principally beans, and a tear in it nearly six inches in length, admitting some of the food to escape among the bowels into the cavity of the abdomen. When the beans with which he had distended his stomach began to swell, from their exposure to the influence of moisture and heat, he became uneasy and pained. The distension of the stomach was so great that the brain became sympathetically deranged in its functions. Eventually the stomach burst; perhaps during some of the animal's desperate struggles, while writhing in the agony of irremediable pain. Even had the stomach not been ruptured, bleeding would, as in all such cases, have been worse than useless.

As in the human-being, teething in young animals, particularly horses, is frequently accompanied by derangements of the system of the most serious description, the symptoms of which are very deceptive, and mistaken for inflammation of a particular organ, often the brain. In some such cases there is much general fever and constitutional disturbance. Not unfrequently mistaken ideas, relative to what the affection really is, leads to blood-lettings being wrongly adopted as a remedy. Frequently when the gum over the tooth is lanced, and a little aperient medicine given, all the urgent symptoms disappear.

The constitutional irritation attending the formation of abscesses, or consequent on injuries, or the lodgment of foreign bodies, as bullets or splinters, is too often mistaken for general inflammatory action of that nature requiring blood-letting. The difficulty of arriving at the real cause of such derangements is sometimes exceedingly great: the suffering animal being unable to describe his sufferings, or point to their locality, is unable to give assistance in determining the nature of the affection. Symptoms, the history of the case, and of the different circumstances connected with it, are the only means of arriving at the truth. It is the duty of persons following veterinary-surgery as a vocation to make themselves thoroughly acquainted, practically as well as theoretically, with the physical signs, and their comparison, by which the different causes of suffering in the brute creation can be distinguished from each other. Although the animal is dumb, the language of his suffering frame, as evinced by physical symptoms, if properly understood, is as eloquent, and less capable of deceiving than mere words.

Although general bleeding has an injurious effect in sympathetic irritation, the abstraction of blood from the diseased locality, if it is possible, is generally found to give relief. Thus, if a joint be suffering from inflammation, the result of injury, and that the constitutional symptoms are severe, it is often found that the abstraction of blood from the locality, either by application of leeches to the shaven surface, or by opening one of the veins, is attended by the most beneficial results.

It is sometimes very difficult to draw an exact line of demarcation between the state of constitutional irritation and that of inflammation. One will, under certain circumstances, produce the other. Generally, if the case be thoroughly investigated, the decision as to treatment is easy.

Generally speaking, the existence of inflammatory action increases the extent of endurance to loss of blood; but to a very different extent in different diseases. A knowledge of the different degrees of hemorrhagic endurance is of the greatest importance in veterinary medicine. As to prescribing the loss of blood (as I have already stated) in a measured quantity, it is absurd. Nothing can give a proper indication of how much should be abstracted but the symptoms which are evinced by the animal as the blood flows. Whenever it is necessary to bleed, care should be taken that the animal be placed in the best position for the operation to be effective. It is customary to turn horses round in the stall, with their tails to the manger, and to bleed them in that position. The ground of stalls is generally much higher before than behind, for the purpose of letting the water drain off; consequently, when the animal is bled with his tail towards the manger, his head and forehead are much lower than natural in relation to the rest of his frame. In proportion as the head is held low, so is the difficulty increased of producing the desired effect on the system; and the great object should be to produce the effect on the brain and nervous system, with the loss of as little as possible of the vital fluid.

In what is called "general blood-letting," the animal's fore part should be placed on a surface as much higher than the hinder one as can be borne without inconvenience. The head should be held high, and a large orifice made in the vein, to admit of the blood flowing freely. If a horse is bled under such circumstances, the desired impression, the incipient symptoms of fainting, will be produced much sooner, and with a far less loss of blood, and consequently stamina, than if the patient be bled in the ordinary position. After the operation, in tying the animal up, to prevent his rubbing the aperture in the vein, the head should not be kept high. If it be so, the reaction will be slow—perhaps imperfect. Often horses are severely injured by their fainting and falling down after blood-letting, while their heads are tied up to the rack. I disapprove of the horse's head being tied up in the usual manner after bleeding. If the operation has been properly performed, as far as regards the opening of the vein, and the subsequent closing of it, there is little danger of the horse rubbing it for some hours subsequently. They generally do not commence to rub the neck until it becomes itchy in healing, or that the pin used in stopping the orifice commences to cause inconvenience.

The irritation and severe colicky pains caused by the presence of worms within the bowels are very liable to be mistaken for an inflammatory attack of those organs, and are frequently treated by blood-letting. Certainly, worms occasionally produce such irritation that absolute inflammation of the bowels is induced, and energetic measures are required to arrest its progress; but bleeding will produce no salutary effect. On the contrary, it will only prostrate the vital powers, without subduing the disease; to overcome which, it is necessary to remove its existing cause—the worms. When, by the presence of the parasites, inflammation has been established in the digestive canal, the case becomes so complicated that much judgment is necessary for its judicious treatment. The first object should be to relieve the pain. This is generally effected by opiates; along with which are frequently given, and with most satisfactory results, turpentine, in combination with quick-acting purgatives. Counter-irritation to the surface of the abdomen is in many cases found advantageous; but blood-letting is seldom necessary.

When it is ascertained that a horse has worms, it is generally found that some remedy, either in form of drench or ball, or both, is suggested as a specific. Persons who have not thoroughly investigated the subject do not take into consideration that there are several kinds of worms, and that what will remove one description is totally inefficacious for the removal of another. One thing for certain: frequently there are cases of severe pain and constitutional disturbance, from the presence of worms in the intestines, that are mistaken for acute inflammation of the bowels, and erroneously treated accordingly, particularly with respect to blood-letting.

The class of diseases which best bear the loss of blood, and, consequently, require it the most, are those affecting acutely

the brain and its coverings. When there are symptoms of apoplexy, or that that disease has actually set in, the system can bear, not only with impunity, but also with advantage, a greater loss of blood than would prove fatal in almost any other disease. This should be expected, when we consider the extensive influence of the brain over the entire system, and that the very essence of the affection is a congested or distended state of its vessels with blood. This state of the brain and its membranes must be distinguished from that caused sympathetically by the state of the digestive organs, already described as a result of indigestion, the presence of worms, or the constitutional irritation in the young animal consequent on teething. There is also a peculiar cerebral affection consequent on the balance of the circulation's being lost, as an effect produced by a peculiar disease of the heart, which should not be confounded with the state of the system requiring blood-letting for the alleviation of its symptoms.

In acute inflammation of the membranes covering the brain, and intervening between that organ and the bones of the skull, the amount of blood that can be taken without injury is very great, yet not so great as that required in cases of apoplexy.

In acute inflammation of the eye, a vast degree of hemorrhagic endurance is evinced.

Acute inflammation of the covering of the lungs and the lining membrane of the chest (pleurisy) bears the detracton of a great quantity of blood.

Inflammation of the covering of the intestines and the lining of the abdomen (peritonitis) comes next in order. In fact, the inflammation of all serous membranes, the lining of cavities that do not freely communicate with the external air, bear the loss of great quantities of blood with comparative impunity. Even if the case be one of acute inflammation within the interior of a joint, this law is evident. It is also the same in acute inflammatory action of all the white tissues of the frame, such as surround joints, the sheaths of tendons, the tissues which bind down the muscles, the lining membranes and the

coverings of the heart, and the fibrous structure which forms the sack in which the heart is placed.

There is an affection frequently met with in horses, that, although not inflammatory, imperatively requires the abstraction of blood for its relief, and the recovery of the animal. It is what may be designated active congestion of the lungs, from their functions and those of the circulation being overtaxed, when the animal is not in a fit state for rapid and prolonged exertion. A horse in high condition, without previous training or the necessary preparative exercise, is taken out either in the hunting field or for fast work on the road; he is forced to continue the pace longer than his breathing apparatus can act with efficiency; he is pushed beyond his powers. If high-couraged, he struggles on against the distress of impending suffocation. If the hunting-field is the scene of his exertions, he totters, and falls from loss of breath. If the road, he is ridden or driven to a "stand-still." He is brought to his stable; the breathing never becomes tranquil; he becomes more distressed. If relief be not afforded, he dies. On opening him, the lungs are found gorged with blood, their colour dark, and every evidence present of his having died from suffocation, consequent on the blood having ceased to circulate through them. This state of the organs may be called the last extreme of congestion. I regard it as one of true apoplexy of the lungs, for there is rupture of, and extravasation from, the vessels.

Blood-letting, pushed to the fullest extent the animal can bear, his head being held high during the operation, is the only reliable chance of recovery. The lungs, surcharged with blood till their vessels are nearly bursting, must be relieved from the blood that has accumulated within them; and that can only be accomplished by copious blood-letting. The over-taxing of horses in a state of undue plethora, from over-feeding and want of sufficient previous exercise, is the cause of this affection, which, though not at first inflammatory, but merely congestive, from the state of the circulation, requires blood-letting to the greatest extreme to which it can be pushed, if the fluid be abstracted with rapidity.—*Irish Farmers' Gazette.*

WHEAT VERSUS STOCK AND GRASS.

The following remarks may attract the attention of scientific agriculturists.

I have for well nigh fifty years been intimately and very largely connected with land, and having been constantly called on to adjust the claims and study the interests of landlords and tenants, I have been much assisted in that duty by preserving a record of the prices of farm produce.

In transcribing an abridged extract from this register, I wish to direct your attention to the following facts:—

1st, That during the last forty years the price of oatmeal has averaged 38s. per load, or about 1s. 1½d. the old peck.

2nd, That when meal bore a price of 35s. per load, wheat averaged about 25s. per boll, or 50s. per qr. of 450lbs.

As these facts are borne out by the annexed table (see below), I now request your attention to the great changes in the prices of all farm produce during the last twelve years.

Beef and mutton averaged 50s. per cwt. prior to 1850. The ruling price is now from 60s. to 65s. per cwt.

Ayrshire cheese for ten years prior to 1852 averaged 8s. 5½d. per tron stone; while for ten years prior to 1862 the tron stone of Ayrshire cheese (I take the prices from the sales of an extensive farmer in this vicinity) averaged 12s. 1d.

Pork in 1852 sold at 7s. 8¼d. per tron stone; while the average of ten years ending in 1862 was 10s. 9½d. per tron stone.

Oatmeal for ten years prior to 1850 (leaving out the two years of the potato famine) averaged 29s. 4d. per load, and for the twelve years ending in 1862 the average price rose to 37s. 9d.

While each and all of the above kinds of farm produce have increased in price, we must turn our attention to the price of wheat, which in our Ayrshire soil is the least remunerative, though by far the most expensive, crop to the farmer.

Ten years prior to 1852 the average price of wheat in this county was 43s. 10d. per qr.

Five years ending in 1857 the price rose to 57s. 9d. per qr.

Five years ending in 1862 it fell to an average of 43s. 8d. per qr.; while the last year it only produced the fairs price of 41s. per qr.

Were the causes which have latterly led to a fall in the price of wheat of such a character as to induce us to anticipate their removal, we might wait patiently for the change; but I am morally convinced that we have much more reason to apprehend a continuous fall than any rise in *this individual* article of farm produce.

As the subject is one of much importance, allow me to explain my reasons *in detail.*

The last ten years have added enormously to the manufactures of this country; every article required for the consumption of our operatives has risen in price, excepting wheat; and I see no cause to anticipate that the same prices which have lately ruled our markets with regard to all other farm produce will not continue to be available, as it is evident that our manufacturing operatives must be fed; and that no farm produce but *wheat* can be largely introduced to the injury of our farmers.

Wheat stands very differently, as we not only have extensive supplies from continental Europe, but we are exposed to heavy importations of flour from America.

On this last point it is necessary to keep in view the present position of America.

Formerly, the Americans in the Northern States purchased largely from us, and their remittances were made in *cotton, tobacco, &c.* This system must now likely cease; and while the Northern States will require supplies of both money and manufactures from us, they will pay us in *wheat* and *Indian corn*, which are almost the only articles of produce at their command. It is true that we are already exposed to this; but when it is considered that the Western States can supply wheat at Chicago at 4s. to 7s. per qr., it is evident that they will soon find some mode of cheapening the expense of transit to New York or to the place of export. Let us contrast the

American wheat husbandry with ours, and we shall find that, barring the expense of conveyance, we never can compete with their climate and their land in the growth of wheat.

Our farmers cannot grow a crop of wheat under the following expense:—

1st year, green crop.—Farm manure per acre 40 cubic yards, 3s. 6d.	£7 0 0
Artificial manures and seed, say	1 15 0
Ploughing, weeding, &c.	3 5 0
2nd crop, wheat.—Ploughing, &c.	1 0 0
Seed wheat and rye-grass	1 10 0
Rent for green crop and wheat two years	5 0 0
	£19 10 0

Against this our farmers have to place the entire loss of their green crop; and their only source of payment for the past and present years is from 4 to 6 qrs. of wheat at 40s. to 45s.

In contrast to this, the American raises wheat without rent, without green crop, and without any expense of horse work, as his horses are fed and kept without expense. In short, there is much reason to apprehend a still greater fall in the price of wheat; and there is every inducement to farmers to take time by the forelock, when an eminent American author informs us, within the last three years, that the farmers in the Western States were burning grain in place of fuel, in consequence of the low prices of wheat and Indian corn.

Ayrshire has long been famed for its dairy and Dunlop cheese: and I would, with great deference, recommend that our farmers should reduce the extent of their ploughing and increase their dairies by a change of husbandry; and I throw out the following proposal for their consideration and adoption:—

1st, Let them retire from wheat husbandry, and restrict their green crop so as merely to supply their milk cows and pigs during winter, and probably fatten off one or two aged cows.

2nd, Let them restrict themselves to a sixth, seventh, or eighth shift rotation (the last being preferable), and I then think that the following system might be profitably followed out.

Let a sixth, seventh, or eighth of a farm be well top-dressed and broken up with a white crop.

Let one-half of this land be green-cropped the following year; and let the other half be top-dressed with 5 cwt. crushed bones per acre, and thereafter sown down with a second white crop.

Let the other half of this field be sown down the third year with a white crop, and thereafter let the whole field lie in pasture till it is again ripe for ploughing in the usual rotation of the farm.

If this plan were followed out with every field, it would ensure good grass after a remunerative crop of oats, and it would relieve a farmer of 40 per cent. of his present expense

of horse labour and manual labour attending his green-crop husbandry.

I throw out these observations with no desire to dictate to our agriculturists, but from a great anxiety for the welfare and prosperity of a class of people on whom this country so much depends.

(Tables referred to above.)

OATMEAL AND WHEAT.

Decennial average of Ayrshire Ffars.

Ffars.	Oatmeal.	Wheat per Boll,	
		240lbs.	
	s. d.	£	s. d.
1820-1829, inclusive	16 11 ³ / ₄	1 5	7 ³ / ₄
1830-1839, "	17 5	1 5	3 ¹ / ₂
1840-1849, "	16 6 ³ / ₄	1 3	10 ¹ / ₄
1850-1859, "	17 3	1 4	9 ¹ / ₂
1860-1862, "	18 9	1 2	10 3-5ths

Leaving out 1845 and 1846 (the years of potato famine), the average of the other eight years ending 1849 was 14s. 8d., or 29s. 4d. per load of oatmeal.

AYRSHIRE CHEESE. Per Tron Stone.

Year.	Glasgow	Sold in	Average
	Bazaar.	County.		County.
	s. d.	s. d.	s. d.
1823 to 1829, average,	7 7 ³ / ₄	7 9	
1830 to 1839, "	8 8 ¹ / ₂	8 8 ¹ / ₂	
1840 to 1849, "	8 7	8 10 ¹ / ₄	
1849, "	—	11 0	} 8 4 ¹ / ₂
1850, "	—	7 6	
1851, "	—	7 6	
1852, "	—	7 6	
1853, "	—	11 0	
1854, "	—	10 0	
1855, "	—	12 0	
1856, "	—	15 0	
1857, "	—	12 6	} 12 0 1 5th
1858, "	—	11 0	
1859, "	—	11 0	
1860, "	—	14 6	
1861, "	—	11 6	
1862, "	—	12 0	

PORK. Per stone of 24lbs.

Year.	s. d.	Year.	s. d.
1852	7 8 ¹ / ₂	1858	10 4
1853	10 2 4-5ths	1859	10 3
1854	10 4 2-5ths	1860	12 1 ¹ / ₂
1855	10 6	1861	10 8 ³ / ₄
1856	11 10	1862	9 9 ¹ / ₂
1857	11 0	1863	10 3

—"G" in the *Scottish Farmer*.

D R A I N I N G .

The first monthly meeting of the members of the Winfrith Farmers' Club took place on Wednesday, Oct. 4th, at the Black Bear Inn, Wool, Mr. J. A. Damen, president, occupying the chair. It was decided that the repeal of the malt tax should form a prominent feature in the proceedings of the next meeting, the subject on the card being "The harvesting of corn, with the disposal of the crops;" and it was thought advisable, by every possible means, to keep before the public the injustice to which the agricultural interest is subjected by the heavy impost upon one of the chief products of the farm. For this evening's discussion, Mr. Bates, of East Lulworth, had undertaken to introduce the question of draining.

Mr. BATES, after a few preliminary remarks, observed that it might appear somewhat out of place in this dry season, when they were all coveting water; but still it was one which was of vast importance as regarded the proper cultivation and productiveness of the soil. He was afraid it was placed in very poor hands, but he would venture to offer a few remarks on the best mode of contending against the damaging influence of water in agricultural pursuits—water proceeding from water-

bearing strata underground, and also stagnant water lying in ditches and on the surface, to be evaporated and carried away in a cold atmosphere, instead of being passed speedily through the land and made a fertilizer, rather than a hindrance to the operations of nature. It was often found that great damage was done by the evaporation of stagnant water, which was detrimental to healthy vitality. It caused a coldness and dampness in the atmosphere, which was prejudicial both to animal and vegetable life; and as an illustration of this he might mention that even ice was manufactured by evaporation. There was indeed no doubt that in clay districts, where there was no opportunity for the water to pass off underground, but where it was exposed to the action of the sun, it slowly evaporated, and affected the climate for a considerable distance round the locality; for instead of the sun, after it had risen, commencing to warm the earth, it was actually, for a considerable time, making the land colder through evaporation. Hence the importance of carrying away the water from the soil as quickly as possible, without allowing it to be subject to evaporation. It was generally admitted that land full of water

could not properly mature a maximum crop in any season. They all knew how desirable it was to have a nice purling stream running through a farm, and this might be either originated or improved by a good system of drainage. Much might be done in this direction by deepening and straightening ditches, and keeping them clean. He had been used to clay districts before he came into this neighbourhood, and he had often observed in a poor, wet field, that the land was considerably better 10 or 20 feet from a good ditch than it was in the other parts, which was no doubt owing to the carrying off of the water. Speaking of draining generally, and the different descriptions of drains, he had often seen rules laid down for the draining of certain fields; but he had found in practice that it was difficult to lay down any general rule for any field. Draining, to be done properly, must be done in a manner best calculated to meet the case in hand. If they had a stiff, tenacious clay, there could be no question that they must put the drains deeper and nearer together than in other soils. On such land they should never be more than 30 feet apart, nor less than 4 feet deep. One indispensable condition was that the work should be done in dry weather, either in spring or autumn. In this case, instead of having to fill in the drains with wet clay, little better than mud, by being exposed two or three days it got hard, and when thrown in left interstices, which by the action of the water afterwards formed fissures, greatly facilitating the rapid passing away of the surface water; and he had found drains cut in dry weather work immediately after a rainfall, while those cut in wet weather did not frequently work till next day, or scarcely at all, owing to the compactness of the clay over the pipes. This was a most important matter in the draining of clay soils. Where they got into a water-bearing strata, however, such as sand or gravel and such subsoils, he did not hold with carrying the drains quite so deep, as the water in such land would drain a long distance almost horizontally. He had no doubt that drains as often failed from being too deep as too shallow, and *vice versa*. When a draining engineer, or anyone else, had got his main drain cut, then was the time to decide the depth, width, and the inclination of the feeders. He had observed a great deal of draining done in the direct fall of the land. He did not approve of this, because he found that, instead of the water, when it fell, going directly into the soil, it was carried some distance along the surface, and went down on the top of the drain in a sort of perpendicular stream. This was manifestly what they did not want. It was well known that rain-water was a rich fertilizer, and that it was advisable it should pass through the soil directly where it fell. By this means the land was considerably benefited, for in the first place it derived heat from the rain, as water falling from the clouds was of much higher temperature than the atmosphere on the surface of the ground. It was also well known that rain-water contained a considerable quantity of ammonia and nitric acid. He believed it was Liebig, a practical agriculturist, who said rain-water might be considered, to a certain extent, a liquid manure; and that being the case, the more of this water they could pass through the soil and into the drains, without interfering with the operations of agriculture, the better for the land. In addition to this, it carried away injurious substances, such as peroxide of iron and other elements injurious to vegetation; and thus, although in an imperceptible degree, they got a purer soil. In order to facilitate the quick flow of water from the surface, he therefore cut his drains diagonally with the fall of the land, so that it might not have to travel far before getting into some of the drains. He had often found in practice that there was not sufficient care taken in the "bottoming" of the drains, which was very essential to the proper laying of the pipes. Drains were often "bottomed" with a tool wider than the pipes, so that when the ground began to leave one pipe was thrust one way and one another, so partially closing the water way. He had also seen pipes laid with a considerable distance between the joints, or pieces broken off, and a piece of clay put over the aperture. These defects it was obvious must interfere with the proper action of the drains; and it was desirable, both in the interest of the landlord as well as the tenant, that if such expense was gone to as drainage incurred it should be done properly. As to filling in drains, he frequently found different opinions prevail. He had seen it done with a clot from the surface of the land, which he considered not only to be a waste of soil, but injurious to the action of the drain, because the surface soil was

more soluble than the ground below, and it was carried by the currents into the drains, which became foul, and thus frequently stopped up earlier than they otherwise would be. In his opinion there was nothing better on the top of a drain than the hardest and strongest earth they could get; and it should be left on the surface to get partially dry, instead of being put in a sloppy state. Another important consideration was the outfalls, or "empts," as they were here termed by drainers. These were very often badly formed, and when once formed quite forgotten. Rabbits sometimes got into the larger pipes, and there dying caused stoppages, and the same was the case with rats in the smaller pipes. It was therefore desirable that there should be some sort of grating at the outfalls, and they should have 6 inches, or still better, a foot fall at the mouth, but, above all, be kept constantly clean and open, so that they might not be forgotten. He had frequently known tracks of drainage completely spoiled, owing to the outfalls being stopped up. Well, he would suppose the draining had been properly done and paid for. But that was not all; there was something more to be done after that. There were deep plunging, deep cultivation, and liberal manuring. After the land had been saturated with water it was naturally poor, and charged with substances not required for the growth of plants, for in its original state it was impossible to keep it properly cleaned. In fact, when they got the water off it was like a patient after a severe illness, and required a tonic—something to strengthen it, and get it into condition. This was as important as the drainage. But he frequently found that when large sums had been spent in draining poor soils the farmer thought he had nothing more to do, particularly on pasture land. In such cases there were no clovers in the herbage, and half the grass was nothing but rushes, while the other half was scarcely worth the name. If they turned stock upon land thus impoverished, it was little or no use, unless they fed with artificials; and could they wonder that they did not come round if they did not use some means to encourage the growth of better grasses and the destruction of the rough grass and rushes? This could only be done by manuring in such a way as to improve the herbage so as to carry a greater quantity of stock. Then they might improve the land by the latter means, but they could not when there was nothing to feed upon. With these few remarks he would leave the subject to be discussed by the members present. Very probably he had told them a great deal that they knew before, and he was aware that he had much to learn upon the question; but he hoped to glean some information from the remarks which would naturally follow, and in conclusion he would tender his sincere thanks for the patience with which they had listened to his observations.

Mr. SAUNDERS said he quite agreed as to the advisability of draining clay land in dry weather, if they had a good fall; but if it was rather flat, they would not, under such circumstances, be perfectly sure they had the proper inclinations, unless the men were very particular about the work. He thought they should be careful to have enough water to ensure a perfect run where the land was nearly or quite level. They might lay in the pipes in wet weather, and put a little earth till they saw the run was good, leaving the other out a little time to get dry and stiff. Mr. Bates justly remarked that they could not lay down one uniform depth for all kinds of land; and on this he differed with the Government, who would not advance money for such purposes unless they laid the drains at a certain depth. It was no use to go to that depth if they could not get an outfall for the water. He thought it well that they should leave their outfall ditch so that it might be sunk a foot deeper, if necessary, after the drains were put in. He had seen pipes put in where, for the want of this precaution, there was no fall for the water. If they got 6 inches or a foot fall the "empts" would keep themselves clear. He had always found that if he did not drain land quite so deep a good outfall made up considerably for the decrease in depth; and he would rather not drain very deep than spoil the outfall. He did not believe anything paid better than draining where it was necessary, and nothing would make better return for the capital expended. In draining "sidelings," and there was a stratum from which water came, by cutting right down the hill they could carry the water direct from the vein, and then they would be able to put the drains much wider apart than otherwise. On strong land, however, he believed they often erred by putting the drains too wide. He quite agreed as to the necessity of liberal

treatment after draining. On green land, however, he would as soon drain with good channels as with pipes; but then they must guard against rabbits and rats. He had a piece done this way merely by cutting a spit and turning the clots upside down to form a water way, which had lasted 35 or 36 years; but it was rather strong land. But this would not do on arable land, because it might be broken down in ploughing. He was a great advocate for having all what was called "air-drained." (Mr. Bates: Ventilated?) Yes, ventilated; and the additional expense was not more than 20s. an acre. He had a field, a portion of which was air-drained and the other drained in the ordinary manner; but the former always worked much sooner than the latter. It was very easily done; and he left the drains open at the top where there was a ditch, or he put a cross pipe to connect them open at one end, so as to allow free ventilation. He quite coincided in the view that no one field could be drained exactly like another.

Mr. SLY spoke of the difficulty he had experienced in draining boggy land. In such cases it was no use to say they should be one distance apart or another; but they had to find where the water came from, and act accordingly. The Government officer came down, and said they must put the drains so far apart, and that all the works must be straight. There was a bog spring about a foot and a-half or two feet from one of these drains, and it continued running for months after. At last he put in some faggots to make a bed for the pipes, and since he had thus tapped the spring it had answered very well. He found a great difficulty with the red water, which left a crystal deposit in the pipes as soon as it came in contact with the air, and therefore he did not think "air draining" would answer in such cases. It was very advisable to have the land properly drained, and not neglect it afterwards.

Mr. MARKE observed that where they had wet land to contend with, it was no use to talk about high farming or improving the land until the water was carried off. As Mr. Bates had said, a good deep ditch would sometimes tell wonderfully. He had deepened a ditch preparatory to draining at the bottom of a "sideling," and instead of one foot as formerly, he had cut it four feet deep. He could not do the draining that season, and the next he found the land did not require draining for a considerable distance from that ditch, and it was now the driest piece in the whole field. He quite agreed with Mr. Bates as to early draining, even in a dry season; and he thought they would always find sufficient water at the bottom to show what run they wanted. They could not be governed by any set rules in draining; but he thought that in whatever soil it might be, where they found a variation in the strata, there they should put down their pipes. Even in clay land he did not think it advisable to go too deep, but rather a little closer. It was, however, no use to drain unless they did something afterwards, for then they had the greatest part of the work to do in encouraging not only good grass, but good herbage. On clay soils, after manuring with farm-yard dung, they got a large quantity of coarse grass; but he generally followed with a good dressing of lime and earth, which was very good for encouraging the growth of clovers in the herbage. He thought there was a great deal of money wasted in Government draining, by the pipes being laid too deep or too far apart; and this involved the tenant in an increased rental for work which was not effective.

Mr. READER said it was an admitted fact that where land was not drained naturally it should be artificially, and the question was the best way to do it. Mr. Marke did not hold with deep draining on strong land. Now, some few years ago he saw a piece of such land, where some of the drains were laid $4\frac{1}{2}$ feet deep, and others only 3 feet; but, after a fall of rain, the former began to run much sooner than the latter, and the land there was much drier than the other part. He supposed it must be owing to the water having a better chance of running sideways into the deep drains than the shallow, the crevices being kept open by the action of the water. From the experience he had had with the Government inspector of draining he had no fault to find, for when he had explained the reasons for draining in a certain way he agreed that it should be done. He did not think 4 feet was too deep on most lands, where they could get a fall. In land that was very wet they must be very careful how they put in their drains; for when the water was drawn off, the soil consolidated, and thus the level was reduced, and it sometimes became necessary to deepen their ditch. He also agreed with Mr.

Bates that they ought to get the bottom of the drain just wide enough to take the pipes, so that they might always remain in their proper position. He did not think there was any necessity for collars except in sandy land, where they always found the greatest difficulty in draining. Some people fancied light land did not want draining, but he had found some that was very wet indeed. He also alluded to what were called "galls" on some of their hills, which did great injury to the crops; and unless they were remedied it was no use to talk about "high farming." Natural drainage was best on all lands, but he believed there was a great deal that might be improved by artificial drainage.

The CHAIRMAN said he thought the longer they could keep the drains open before putting in the pipes the better, either in light or strong land. On heavy land it allowed the clay to bake, and on light land it prevented the pipes becoming filled with silt, by permitting the first flow of water to run off before they were laid. He quite agreed with the observations that had been made respecting the effect of digging a deep ditch, by which means in gravelly land he believed they might drain acres and acres of land. In clay soils, however, perhaps it might have no effect at all. Pipe-draining was all the rage now, but it made a great difference whether they had good pipes or bad ones. He had some put in 20 years ago, and there was great difference between them and some now manufactured. It was therefore highly necessary that those who had the management of drainage works should see that the material they used was of good quality. After a few other remarks Mr. Daunen concluded by proposing a vote of thanks to Mr. Bates.

Mr. SAUNDERS seconded the proposition, which was carried with acclamation.

Mr. BATES, in returning thanks, still held to the importance of draining clay soils in a dry season; and, as to the fall, it could easily be decided by a spirit level, with which a drainer should always be provided. He also thought it desirable to have as few "empts" as possible; then they were more likely to be properly attended to, and there should be some fall between them and the ditch. Mr. Saunders appeared to differ from him as to the direction of drains in sloping land, and advocated direct drains in the direction of the fall to the water-bearing strata. But on clay land the difficulty was to get rid of the surface water. They found very little difficulty in dealing with water-bearing strata on clay land. It might, however, have to be dealt with, and then the best way was to get at it at once. Generally speaking, however, he preferred oblique draining to working at right angles. He recollected that ventilating drainage was greatly in favour a few years ago, but it had gone out of fashion, and he would rather have the pipes a little larger to allow sufficient space for the water to flow without filling them than to have them open at the ends. Mr. Sly had spoken of the accumulations from the red water in the bog, which was very difficult to contend against. The water was charged with iron, and in passing through the drains nitric acid liberated a quantity of iron, which, coming in contact with the air, was oxidized. It could only be dealt with by continued care and attention; but by continually passing the rain-water through the soil it might in time remedy itself. He thought the reason of the deep drains acting sooner than the shallow ones, as noticed by Mr. Reader, was in consequence, as they knew, of water gravitating directly, and there was a greater pressure in the column of water running into the deep drains than in the case of the others. As to the subsequent treatment of the land, he did not think anything was better for an after-dressing than ashes or lime compost for producing a good herbage of clovers, &c. With regard to the remark of the chairman, he might say that he would sooner see a thousand pipes broken up, if they were not good, rather than that they should be put down as drains. Bad pipes were worse than bad labour or bad management in any form.

HOW TO LEAD ANIMALS.—Cattle, it is said, of all descriptions, horses, calves, and sheep, may be led by making a slipping noose, and fastening it to the lower jaw, passing the rope (which must be small) around the neck and through the noose on the jaw. It is a very easy way of leading a sheep, one not obliged to go behind and "push." After once pulling, the sheep will follow right along, with no trouble.

PLOUGHING IN AUSTRALIA.

At the South Australian Agricultural Society's Annual Ploughing Match the judges awarded the first prize plough, presented by Messrs. Tuxford, and £10, to William Hamlin.

There was a fair show of implements. Messrs. Tuxford Brothers and Messrs. Jones Brothers exhibited imported implements, as usual; while Mr. Joseph Mellor evidenced what colonial skill could accomplish. There were no fewer than seventy ploughs shown by Messrs. Tuxford and Jones, so that a wide choice was left to ploughmen and agriculturists as to the implements they might most desire to obtain. There was also a variety of harrows (circular and zigzag), scarifiers, double furrow and multiple ploughs, field gates, sheep hurdles, and other essentials to the agricultural and pastoral farms.

The following entries of implements were made:—

Best Plough—Nos. 1 to 35, Messrs. Tuxford; Nos. 36 to 70, Messrs. Jones.

Best Subsoil Plough—Nos. 1 to 4, Messrs. Tuxford; Nos. 5 and 6, Messrs. Jones Brothers; No. 7, Mr. E. M. Bagot.

Best Harrows—Nos. 1 to 5, Messrs. Tuxford; Nos. 6 to 15, Messrs. Jones Brothers.

Best Scarifier—Nos. 1 to 4, Messrs. Tuxford; Nos. 5 and 6, Messrs. Jones Brothers.

Best Double Furrow Plough—Nos. 1 to 3, Messrs. Tuxford; Nos. 4 to 8, Messrs. Jones Brothers; No. 9, William Crossman.

Best Multiple plough—No. 1, Messrs. Tuxford; No. 2, Messrs. Jones Brothers; No. 3, Mr. E. M. Bagot (quadruple).

Best Landpresser, Two-wheeled—No. 1, Messrs. Tuxford.

FARM CROPS AND FIRE INSURANCE.

The frequent fires which take place in stackyards and farmsteadings induce us to direct the attention of our readers to the importance of providing against accidents of this nature through the medium of insurance, which can be so readily effected in all parts of the country. It is true that, in the case of some of those fires which have recently occurred, it was stated that the loss was covered, or partially covered, by insurance; but it is nevertheless true that there are hundreds, we may say thousands, of farmers in the kingdom who never think of insuring their crops, when gathered in the rick-yards, against fire. They may insure the buildings on their farms, being perhaps obliged to do so by the terms of their leases; but their crops, the result in a great measure of all their toil and anxiety throughout the year—that for which they "haste to rise up early, and so late take rest, and eat the bread of carefulness"—are left exposed to the manifold chances by means of which they may speedily be reduced to heaps of ashes. A spark from an engine, a match thrown down by a careless smoker, children at play, or, as it is feared has been the case recently, the work of a cowardly incendiary, may very soon destroy all the fruits of the year's labour, and, it may be, leave the owner a ruined man.

Danger from fire is much greater now than it was at one time. Steam-engines, fixed or locomotive, are common; and the manner in which the latter are sometimes employed in thrashing not infrequently leads to accident. There is also the almost universal use of lucifer matches to dread; and as these are often carried about loosely in the pocket, it is impossible to guard against accident; nor is it easy, when fire occurs through this means, to trace it to the proper cause, and thus, perhaps, it is attributed to something which had no connexion whatever with the real source of the mischief. As to loss from deliberate incendiarism, let us hope that such cases rarely take place. It is the most cowardly of all crimes—one which cannot be expected to benefit those by whom it is committed in the slightest degree. The gratification of a revengeful disposi-

tion may indeed prompt a man to the commission of this crime; and it no doubt possesses this advantage in the estimation of a sneaking coward, that it can be perpetrated without any immediate risk of personal danger to himself. A penny box of matches is far more than sufficient to destroy thousands of pounds' worth, and a fleet pair of legs soon put the criminal at a safe distance from the scene of his operations.

There are, perhaps, few sights more attractive to one who looks upon such matters with a farmer's eye than a large and well-filled stackyard, with its neatly-built and snugly-thatched ricks ranged in goodly order, and promising abundance of food for man and beast. In some parts of the kingdom the produce of the farm is all secured within one enclosure; while in other places it is scattered over the farm, and ricked often in the fields where it is grown. The latter plan, although inconvenient in some respects, has this advantage, that when fire occurs only a portion of the crop is exposed to danger; whereas, when all is gathered together into one place, the burning of one stack is fraught with danger and almost certain destruction to all, and even to the farm buildings near which the stackyard is usually placed. Dividing the crop, therefore, is on the whole the safer plan; and it strikes us that of late years this has been partially adopted in several cases where formerly it was all secured in one place. This is so far a security against at least total loss, but along with this an insurance ought to be effected in every case. It is not a practice to which only rich men or extensive farmers need have recourse; it is equally open to, and perhaps more required by, the struggling poor man, to whom the loss of a single stack would be a very serious event. Under any circumstances farming is not such a profitable business as to allow those who are engaged in it to run any needless risks. As that experienced authority, Mrs. Poyser, says in "Adam Bede," farming is "raising victual for other folks, and just getting a mouthful for yourself and your children as you go along. It's toiling and striving, up early and down late, and hardly sleeping a wink when you lie down for thinking as the cheese may swell, or the cows may slip their calf, or the wheat may grow green again if the sheaf; and after all, at the end o' the year, it's like as if you'd been cooking a feast and had got the smell of it for your pains." When, therefore, some of the disastrous chances attendant on farming can be mitigated by such a ready, simple, and comparatively inexpensive process as insurance, we think that every prudent man should avail himself of it.

BREWERS' GRAINS.—If any corroboration is needed as to the alarming statements in reference to the fearful havoc the cattle plague has made among milch stock in London and suburban dairies, the fact of there being an unprecedented glut of grains without sale at the great London breweries amply testifies as to the great clearance the cattle pest has made in the cowsheds. The invariable custom with the large and other brewers is to let by contract for one year, dating from Michaelmas, the grains produced from the brewings, and hitherto considerable competition has prevailed among the cowkeepers to secure contracts, and very frequently sub-contracts are made at high premiums; but this autumn a most signal and ominous blank exists, and the great brewers are unable to dispose of the wetted malt on any terms or definite period; and several large brewing firms are giving away grains, and even paying to have them cleared away, and unfortunately very many sheds which stabled up from 10 to 60 milch cows each are now entirely empty, and the consumption of grains, which are the *sine quâ non* of London cowkeeping, is so diminished by the reduction of dairying stock by the pestilence of the contagious cattle disease, that they are hawked about at the London railway goods stations at 6d. per quarter; and country dairy farmers, who now daily transmit by railway large dairies of milk to metropolitan dairymen in their difficulties, are generally adopting them as a "staple commodity." Although this mode of feeding certainly increases the supply of milk, yet it is by no means improved in the quality, and the anticipated great boon Londoners expected to derive by having "pure country milk" imported into the metropolis will be reversed by the reception of "London-made milk" from the country.

THE CARCASE TRADE, HOME AND FOREIGN.

There are few things more desirable than the immediate completion of that great work now in progress, viz., the change from fat stock to carcass markets, more especially in all our large towns. In the metropolis, the driving of live stock in the overcrowded streets has long been felt an intolerable nuisance, apart from all other sanitary and commercial considerations; but the rapidly increasing growth of towns in the enjoyment of a higher degree of social wealth is giving rise to a demand for animal food in quantity and quality wholly incompatible with the present antiquated live-stock system to supply.

No doubt our consumption of salted provisions, imported from America and other countries, has, at the same time, greatly increased; but the recent advances in sanitary science have thrown a flood of cold water upon the propriety and economy of our hard-working people continuing to live to the extent they have hitherto done on salted animal food; so that any increase of such is beside the question. A generous and regular allowance of fresh animal food of the best quality has become an essential element in the daily necessities of life of the British public. Hence the reason why so large a portion of those at the helm of affairs, who cannot see beyond the routine of the narrow circle in which they move, have shown a degree of sensitive alarm at the proposition of prohibiting the importation of foreign cattle, in order to protect home stock from the cattle plagues of Russia. But all such fidgety fears are premature, and unworthy of the current age; for, under a properly conducted carcass trade, our large towns, and the country generally, can be better supplied with fresh foreign beef and mutton of a far superior quality to that now supplied by the live-stock system.

It will not require a tedious amount of ratiocination to satisfy the intelligent reader of the soundness of the above premises, relative to the increase in question of both the quantity and quality of home and foreign butcher-meat, under an enlightened and properly conducted carcass trade, as the loss of both weight and quality, under the current live-stock system, is incredibly great. No doubt, there is a loss of weight now experienced by those engaged in the carcass trade; and, in the majority of instances, also a heavy depreciation of quality. But the former (loss of weight) is chiefly water; while the latter, under the improvements contemplated, would be reduced to nothing, comparatively speaking; hence the practical conclusion.

Less than half a century ago it would have been a hopeless task to have convinced the bulk of the butchers of the metropolis that they could ever get from the dead-meat markets a supply suitable for their customers. But the fears and prejudices so vociferously expressed by them when the removal of the live-stock market from Smithfield to Islington was first proposed have been since thrown overboard; and now the vast majority visit Newgate-market and Leadenhall-market daily. In point of fact, they could not, at the present day, serve the demands of their customers without daily supplies of "choice bits" from the dead-meat market.

All pictures, it is said, have each two sides; but the commercial one under consideration may not inaptly be said to have four sides—two for the seller or farmer, and two for the buyer or butcher. The latter two, those of the butcher, may be disposed of in a single paragraph; for if we suppose that quality remains upon a footing of equality, butchers can serve their customers better from the dead-meat market than from the live-stock one; for first-class butchers who buy in the latter have for the most part to consign to the former, or sell at home to some neighbour those parts of the carcass not suited to the peculiar tastes of their class of customers. In short, there is a practical defect in the live-stock trade wholly incompatible with the classified wants of the community, so to speak—a defect so manifest in character, and so potent in force, that it is fast undermining the live-stock trade as a system; hence the rapid growth of the nefarious middle-class crafty jobbers, who step in and purchase in the live-stock market, for the carcass trade, so as to enable butchers to get supplies suitable to the

peculiar demands of their respective customers, one class purchasing almost nothing but the best hind quarters, another class chiefly fore quarters, and a third anything saleable they can get for little money. Then there are those who keep cook-shops, and the like, who attend the dead-meat market for their daily supplies. Society is similarly divided, and butchers have no alternative but to go with the times (*i. e.*, the demands of their respective customers), and the times are evidently on the ascending movement on the part of the upper and middle classes of society, who are becoming more particular about the quality and the choice part of the carcass, which they prefer. To such a determination is this preference now being carried, that butchers find it no easy task to retain some of their best customers, who when they see their butcher's stalls loaded with fore quarters, the hind quarters being all sold, or ordered, they at once without ceremony pass on to the next butcher's stall, where nothing but choice parts from the dead-meat market are kept. The practical and professional conclusion is manifest; for no live-stock butcher can enter into competition with carcass butchers, unless he opens at the same time a third-class shop in some of those localities where his fore-quarters and refuse can be sold at a lower price; and even then this alternative is a very problematical one, in a pecuniary sense. In other words, if a first-class butcher can sell four hind-quarters for one fore-quarter, then his business is incompatible with the live-stock trade. The farmer and butcher who cannot see the practical force of this must be professionally blind! It follows therefore that the contemplated improvements in the carcass trade would be an invaluable boon to all classes of butchers, and, we may add, an equal advantage to their customers—all classes of consumers.

Using the above figure of speech once more, it is only the two sides of the farmer's question that we have to examine on the present occasion. Considered as a commercial undertaking, it consists, *first*, in getting fat stock of every kind into the best possible condition for being slaughtered; *secondly*, in the best method of slaughtering, so as to meet the peculiar demands of purchasers; *thirdly*, in the best method of selling or consigning the carcass and the offal; and *fourthly*, in the railway and steamboat conveyance of carcasses, hides, &c. A very cursory review of each of these subdivisions of the work will suffice to show that, as at present carried out, they are all subject to many improvements. In point of fact, candidly and honestly speaking, it is hardly credible that a subdivision of commerce so important to the whole community, both in a sanitary and pecuniary light, as the one under consideration is, should be so neglected in all its multifarious ramifications, and even upheld by the force of habit, as it were, in a state so deplorable as almost to baffle conception; and however much we may feel disposed to blame railway companies and steamboat companies for the little they have hitherto done in forwarding the cause of progress, we cannot, on the other hand, wholly exculpate farmers, either English or foreign, who are manifestly the principal party, or the leading party in the transaction, and who are therefore in duty bound, not only to make a strong pull themselves, but also to apply the whip with becoming fortitude to the tender extremities of railway companies and steamboat companies, in order that all may pull together.

First: With regard to the first of these questions, those farmers who have attended to slaughtering are familiar with how much can be done to improve the quality of the carcass by the quality of the food consumed by animals a short time before they are sent to the slaughter-house. There is no fact better established than this—that whether it be beef, mutton, or pork, the quality is always less or more affected by the quality of the food consumed; but with the differences in question, and loss now sustained from a depreciation of the quality of the carcass, farmers are not so familiar, and hence have to learn the benefits they would gain by giving their fat stock a superior quality of food, were it only for a month previous to slaughtering. But we cannot pass from this head of our subject to the next without drawing the reader's attention

to the fact that an improved carcase-trade, as contemplated, involves an improved dietary altogether, for what is good for the fat ox, sheep, or pig, a few days before slaughtering, is just the diet it should have from first to last, and for no other reason than because it is the most economical and profitable to the farmer. Manufacturers who strive to turn out a superior article invariably pay the greatest deference to the quality of the raw materials; and this golden rule the manufacturers of beef and mutton and pork can no longer follow as an exception.

Secondly: The indiscriminate slaughtering of all sorts of cattle, healthy and unhealthy, in the same slaughter-house, as now practised in the metropolis and all our other towns, large and small, is highly objectionable. Even when in life, farmers find it advantageous to separate animals that are not thriving from those that are thriving; and the more closely this is attended to, the more successful the results. And when the carcase of the badly-thriving animal is hung up close to that of the healthy one, it always less or more communicates to it some of its own bad qualities. A badly thriving animal is not a negative quality, and very seldom a less degree of vital force, but the presence of some active principle or rather poison in the system, that should not be there, and that active poison remains in the carcase in the vast majority of cases if not in the whole. What that principle may be, is a question which has not been determined up to the present time, some giving it the name of a poison—mineral, animal, or vegetable—others that it has life, animal or vegetable, and so multiplies like some fungi at an overwhelming rate. Most probably all these are right, for carcases sometimes afford ocular proof of vitality both before and after cooking, more especially of the growth of fungi, the whole rapidly becoming green and blue. We are, however, more disposed to take a chemical view of the change that takes place in the majority of cases, a conclusion which is evidently borne out by the rapid manner the carcase begins to smell, and the short time it keeps both before and after it is cooked.

To meet this peculiar feature of the trade practically, there should be first, second, and third-class slaughter-houses and cooling and setting-houses, and carcases thus separated according to quality ought never afterwards to be mixed together. In all other trades the good and bad are kept separate. The most stringent rules, therefore, ought to be laid down and enforced, in order to carry out into practice this salutary rule of subdivision; for until this is done those who produce the best quality of meat will never receive its honest value in the market, while its adoption would soon put an end to the slaughter-

ing and consignment of unwholesome meat to London and other large towns.

Thirdly: Under a sanitary view of the subject, nothing, comparatively speaking, requires to be said upon the next head, the disposing of the carcase and offal in the best market. In this case the rule must obviously be left for the experience of the future to determine; the experience of the past being out of date. Were any of the great authorities of the seventeenth century, for example, to rise up from the dead, and to commence talking about their experience to the present generation, they would only create laughter; and not a whit less absurd and ridiculous is the conduct of those farmers and butchers of the present day, who are rushing into print with their experience as a guide for the future. In short, we are advocating for their own individual interests a *new experience for both*, i. e., improvements in the carcase trade, of which neither have any experience at the present time. The case is a very clear one when practically seen and investigated in all its multifarious details.

Fourthly: The proper conveyance of fresh animal food (including not only beef, mutton, and pork, but also dairy produce, fish, fowl, game, &c.), by railway and steamboats, is by far too comprehensive a proposition to be disposed of in a concluding paragraph, or even in a single paper; and, besides, it is a subject that requires to be described by itself. Suffice it to say at present, therefore, that this part of the carcase trade is the farthest behind of any in the march of progress, and the most culpable. An article so perishable in character, so vast in magnitude and value, and of so much importance to the country both in a sanitary and pecuniary sense, ought to be conveyed with greater care than at present, granting that no improvement whatever can be made in the method of conveying. But the present method of conveyance is so antiquated as to merit the most sweeping condemnation that the agricultural press can give it. And it were difficult to say whether railway companies or steamboat companies are the most to blame; for the practice of both is, at the best, an abominable routine, fraught with all the mischief imaginable, as if the practical problem which both companies had for solution was, How best to destroy the meat, generate morbid poisons, and thus sow the seeds of disease amongst consumers? And at the other end, How best to keep down the producer's interest to a minimum? And after carcases have undergone much unnecessary delay in the conveyance, and all sorts of inoculative sausage-making processes, the mode of delivery and marketing in the capital is equally far from what it should be.

THE CATTLE PLAGUE.

TO THE RIGHT HONOURABLE THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—Although the subject of my letter is on the structure of the ox, sheep, and other ruminants in relation to the cattle plague, circumstances have occurred since my last communication that are fraught with so much practical importance to the grazier and to the consumer, that I trust that I shall be excused for introducing them. During the last week I have examined the body of a cow, that animal presenting scarcely any signs of indisposition: she was passed at the first examination, but a few hours after this the practised eye of the inspector detected indications of the disease, and he ordered her to be slaughtered. I carefully cut through the whole length of the alimentary tube, and I examined all the other viscera, including the brain; and although scarcely any symptoms were present during life, many organs exhibited unmistakable evidence of this peculiar disease. The first and second stomachs (paunch and honeycomb), as usual, presented to the naked eye internally a healthy appearance, the epithelium covering not peeling off as in the more advanced stages of the disease; and the same remark applies to the third stomach (lealy); but the fourth (digestive) was studded with red circular spots, arising from the loss of the epithelium, and not from ulceration, as stated by many. The whole tract of the small and large intestines presented the characteristic congestive markings, with the pap-like matter between them in many

places; the trachea, the large column in the left ventricle of the heart, the endocardial membrane, and the vagina, all exhibited preternatural vascularity and ecchymosis. The aggregate glands, so prominent in health, were scarcely perceptible, a condition in which I have always seen them in this disease, and never in an ulcerated state, asserted by many—a fact of great importance when taking into account the chances of recovery and the benefit likely to accrue from medical treatment.

Now, my Lords, the above case clearly shows the insidious nature of the complaint, and that during the period of incubation, when an animal is apparently healthy, latent disease of a formidable nature may be present, that our fairs and markets may abound with cows and oxen in the same state as the one described, infecting all around, and spreading the disease far and wide. The cow in question would have been bought by nine graziers out of ten, without a suspicion being entertained of the presence of the cattle plague. Thousands of animals, I believe, in the same condition are in our fairs and markets, and their flesh is sold for food. And this leads me, my Lords, to a practical and important matter, one that materially concerns the consumers of meat and the health of the people. After keeping a steak, cut from the cow I have described, for two days, I and a favourite cat breakfasted off it, and up to the present time no ill effects have been exhibited, I believe that the meat

in the first stage of this disease is perfectly wholesome (I do not recommend its distribution among the people), and I question whether in the latter stage it would produce any injurious effects upon those eating it; but I hope, by a large series of experiments, to be able to speak more positively upon this subject. The unfortunate death of a veterinary surgeon at Sudbury, Suffolk, I believe, has led to very erroneous inferences respecting the poisonous nature of the cattle murrain, and its effects upon the human subject. I have met with a great many men with cuts and scratches on their hands and fingers, who are daily flaying and cutting up diseased animals affected with cattle plague, but in no instance have I known any injurious effects from it. In this respect the disease forms a remarkable contrast to that of splenic apoplexy, to which I was the first to direct the attention of the profession in this country* in 1849, and in an essay on this disease published in the "Bath and West of England Journal of Agriculture," 1863, I have given several examples of the injurious effects of this poison upon men, and of the fatal influence of the poison when eaten by pigs, dogs, and ferrets. Mr. Hamilton, one of the commissioners at the late exhibition for New South Wales, told me that, when this disease was prevalent in that country, the men were so disabled from punctures and the inhalation of the poison, when flaying the sheep, that they refused to work unless they received an amount of pay adequate to the risk.† The conclusions I draw from the foregoing are, Firstly, that the cattle plague abounds in our fairs and markets in a latent form, and that in this way the disease is disseminated to a fearful extent; Secondly, that, as far as my researches have gone, the common opinion that the meat of animals dying from cattle plague in the last stage is likely to produce pernicious effects when eaten by man is probably erroneous; Thirdly, that neither the exhalation from the bodies of animals dying of this disease, nor the introduction of the blood or secretions of such animals, by means of cuts and scratches, have, as far as I can ascertain, produced any injurious influence upon human beings; but, notwithstanding this, every precaution should be taken to prevent the ill effects that might arise in cases of cuts and scratches, by the immediate use of salt or spirits of turpentine.

I now come to the more immediate subject of my letter, viz., the structure of the ox, sheep, and other ruminants, in relation to this disease? I shall not touch upon minute and microscopic anatomy, for the accurate description of the intestinal canal of the ox alone would fill a large volume: my object will be to introduce such matters not generally found in books, that are the result of my own observations and dissections; and first, of ruminants generally, and I assume that every animal that chews the cud may be affected with this disease, supposing that the accounts we have from Russia and Germany of the existence of cattle plague in the sheep are correct, but probably the ovine race in this country will not suffer materially from this outbreak. The great length of the alimentary tube of a ruminant is one important feature in its structure, and it is one that has an important relation to this disease. To give your Lordships a correct notion of the extent of this canal in the various species of ruminants, I subjoin a list of some that I have dissected. The extract is made from the "Proceedings of the Zoological Society of London, February 1864," and the measurements were all made by myself:—

	FT.	IN.
Giraffe, old female, 18 years (<i>C. giraffa</i>)	254	0
" young male	209	0
" young, two months	107	11
Eland (<i>O. canna</i>)	161	0
Bubaline antelope (<i>A. bubalis</i>)	94	6
Old leucoryx (<i>O. leucoryx</i>)	94	6
Young male do.	65	0
Addax (<i>A. nasomaculata</i>)	72	0
Bontiboc (<i>A. pygargus</i>)	64	2
Dykerboe (<i>C. mergens</i>)	95	0
Rheetboe (<i>E. arundinaceus</i>)	48	0
Springboe, young (<i>G. eucare</i>)	38	0
Sing Sing (<i>A. kob</i>)	64	0
Gazella vera	37	4
Indian antelope (<i>C. leucorhina</i>)	39	0
No. 2 do.	44	0

	FT.	IN.
Bennets's gazelle (<i>G. bennettii</i>)	43	0
Dorcas Gazelle (<i>G. dorcas</i>)	41	5
" furtus, 15 oz.	10	6
Indian antelope (<i>A. cervicaffra</i>)	64	0
" young, a few weeks old	33	6
Philancomber antelope (<i>C. marxellii</i>)	39	8
Isabelline antelope, young (<i>A. isabellina</i>)	31	0
Four-horned antelope (<i>T. quadricornis</i>)	50	10
Harte beest (<i>B. caana</i>)	83	2
Nylghau (<i>P. picta</i>), at birth 14lbs.	32	2
" old female 148 ft. 10 in., old male	140	0
Rein deer, old female (<i>C. tarandus</i>) 120 ft., No. 2	126	0
Mexican deer (<i>C. macrivanus</i>)	52	6
Malacca deer, young	48	4
Sambur deer (<i>C. unistolens</i>)	80	0
Rocky Mountain deer	68	0
Virginian (<i>C. virginianus</i>) deer, two days old	18	2
Musk deer (<i>M. moschiferus</i>), weight 3lbs.	13	5
Elk (<i>C. alces</i>)	129	0
Camel (<i>C. bactrianus</i>)	—	—
Alpaca (<i>A. pucos</i>)	70	0
Huanaco (<i>A. huanaco</i>)	95	0
Goat, four months old	30	0
Brocket	55	9
Mutton (<i>O. montanum</i>)	46	7
Acudad (<i>G. troglaphus</i>)	91	0
Cape sheep (<i>O. aries</i>)	97	7
Southdown lamb, six months old	74	9
Old Southdown ewe	109	8
Leicester ram	117	0
Ox (<i>B. taurus</i>) 123ft., 136ft., 140ft., and	186	0
Bison, old (<i>B. americanus</i>)	157	0

All the above animals, excepting the *camelide*, have the same number of stomachs (four) as the ox and sheep; but there is a great difference, as I have shown elsewhere, in the character of the intestinal glands and *sacculi* as in the camels, llamas, and guanachos, the *rumen* (paunch) is smooth, and free from villi; unlike the same part in other ruminants. To give some notion of the capacity of the alimentary canal in a ruminant (and the same will apply to nearly all, if the size of the animal is taken into account), let me quote an extract from my paper on the Anatomy of the Bactrian Camel (*C. bactrianus*).* No one can form a proper notion of the immense size of the camel's stomach unless it is seen distended; when in this state, the following are the measurements and capacities of the various parts: the length of the oesophagus 6 feet, of the rumen 43 inches, its circumference 5 feet 6 inches, and it holds (including the water bags) twenty gallons of water. The length of the second stomach is 21 inches, and its capacity about six quarts. The third stomach is 34 inches in length, and holds about three gallons of water. The fourth stomach is 18 inches in length, and will contain three quarts of water. The fifth cavity is 9 inches long, and holds about two quarts of water. The capacity of all is about 25 gallons 3 quarts; and the length of all, when distended, is 9 feet 6 inches. As regards the quantity of water that these cavities hold, I cannot pretend to speak with perfect accuracy.

If we take the capacity of these gastric cavities in the ox and sheep, we shall find that, taking size into account, they will be larger than in the camel. The stomachs of a large ox will probably contain 30 gallons of water, but in the ox and sheep we have a more complicated digestive apparatus than in the camel. Let us briefly examine that of the ox: all the stomachs are supplied with villi, folds, and elevations of the membrane, so as to multiply the absorbing surface to an enormous extent. In the paunch, the leaf-like villi in some parts number about 206 to the square inch. Along the whole course of the alimentary tube we have longitudinal and transverse folds, so as greatly to increase the superficies; and, in addition to these, we have in the ox, besides millions of villi, long and numerous aggregate glands. In a healthy bull, that I have recently dissected, the total length of these glands was 18 feet, and they varied in width from one-third to one inch in width; but as I have remarked before, in cattle plague these glands, probably from want of use for the first and third stomachs, are generally blocked up with vegetable

* "On the Structure and Use of the Spleen (out of print)."

* "Proceedings Zoological Society of London, March 1865."

matter. Fancy, my Lords, the influence a millionth of grain of arsenic must exert amongst a hundred-weight of dry vegetable food! And it is this stoppage in the first digestive cavities—this paralysis, it may be, of the very fountain of nutrition, that leads to the difficulty of treating this disease, as I hope to show in my next letter. There is nothing in any other structure of the ox, that I know of, that materially concerns this inquiry, except the tongue, which as is well-known, is furnished with spines, as in the lion, and in many carnivora, probably to enable the animal better to take the coarse grass, to which it often gives a preference.

I have stated that the alimentary tube of the ox varies in length from 120 to 180 feet, that of the sheep from 70 to 117, but the great difference in the digestive apparatus of the ox and sheep is the absence of spines on the tongue of the latter,

and the less complicated glandular structure of the alimentary tube. The foldings and doublings in the intestines of the ox are scarcely seen in the sheep, and the aggregate glands in the latter animal are comparatively of small extent and less elevated. In the intestinal tube of a lamb now before me, I find that these glandular patches amount to ten, each about three inches in length, and about one-third of an inch in width. These differences, however, scarcely serve to explain the comparative exemption of the sheep from this disease.

In my next letter, my Lords, I hope to describe the pathology of this "Cattle Plague."

I have the honour to be, my Lords,

Your obedient servant,

EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, Oct. 7, 1865.*

CALENDAR OF AGRICULTURE.

Finish the sowing of wheat, if any remains undone from last month. Take up Swedish turnips, and store the roots at the homestead, and give the tops and small bulbs to the sheep in the fields, or to young cattle in the yards.

Flood water-meadows. Clean out and put in to proper order the main channels, conveying-gutters, and the sluices of floodgates.

Begin to cut underwoods, plant forest-trees, open-drain plantations, repair old fences and make new ones, cast-open ditches, and repair roads.

Thrash grains once or twice in a week regularly, to supply the beasts with provender and the yards with litter. Sell and deliver all grains as thrashed. Cut hay and straw into chaff, mixed for horses, the fattening bullocks at the stake, and for being steamed for the milch cows. Apply all litters thinly and evenly over the yards, and spread over the surface all different substances for the purpose of being mixed.

Supply to the cattle in the yards by break of day an ample feed of turnips, rooted and topped for the fattening beasts, and with the tops attached for the other sorts of cattle. Wooden cribs with latticed bottoms allow the escape of filth and

water. The turnips being all eaten up by night, the choking of animals unseen is prevented. Give to milch cows cabbages and beet, and one feed daily of steamed meals.

Continue the feeding of sheep, as directed last month, folded on the bare ground over night, or allowed to run back for shelter.

Feed pigs as directed last month; give ample littering, and keep the animals dry and warm. Feed poultry with light grains, and with steamed potatoes and meals mixed, and given in troughs placed in shelter-sheds in the poultry yard.

Attend to the feeding of young horses in the farm-yard. Supply fresh water in a trough, and a convenient and dry shelter-shed. Give hay and straw in chaff, bran, and oats, and a daily feed of raw or steamed roots. The first winter's keep is the chief agent in making superior animals of every kind.

Begin to plough stubbles for next year's fallows, and prepare by fallowing, as long as the weather permits, the land required for the earliest green crops, as potatoes, beet, and ruta-baga, which are very much forwarded by the autumnal preparation of the land.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Artichokes: Protect the plants by mulch or masses of leaves, after removing all the old stalks and decayed foliage. Dig roots for a temporary supply of the so-called Jerusalem artichokes. Store all the potatoes, carefully observing the condition as to soundness or decay. Keep the store very dry.

Broccoli and cauliflower in the open ground should be laid down, and be guarded with a covering of dry earth, laid close over the stems.

Carrots: Dig and store; also beetroot and some parsnip.

Celery: Finish earthing; if frost threatens, cover the ridges and tops with dry haulm.

Endive: Tie up some plants, and remove others to dry frames, for bleaching.

Lettuces in frame, give air to occasionally. Do the same by radish and salads.

FRUIT DEPARTMENT.

In mild weather, spur-pruning of apple and pear

trees or espaliers is now performed; wall-trees and berry-bearing shrubs are sufficiently early in February. Raspberries are tied by fillis-cord stakes, six rods to each, stopping at an angle towards the North, or to a neat open trellis. The cluster of canes must be open to the sun: perpendicular tying crowds the bundle to stakes.

FLOWER GARDEN.

Plant tulips, hyacinths, jonquils, &c., in rich sandy beds. Place the bulbs in holes two inches deep, among some sand, and to touch the bulbs all round, and at the base. Move herbaceous plants; roughly fork the surface of beds, and scatter over the surface a covering of old dung of cattle and decayed leaf-mould.

Observe neatness and order everywhere. Any pits, frames, and similar erections must be kept dry for semi-hardy plants, and aired frequently. Dry sun-dust is a fine material to plunge in, as it guards the mould effectually.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR OCTOBER.

Somewhat heavy rains having fallen in most parts of the United Kingdom, the progress of outdoor farm labours has been interrupted. However, in most of the leading districts they are seasonably forward. The pastures have continued full of grass; but the supplies of stock in them have been considerably less than in many previous years. Fortunately for the breeders and feeders of both beasts and sheep, ample quantities of food have been secured for winter consumption. At a period like the present, when meat is unusually high in price, notwithstanding the immense importations from the Continent, an adequate supply of food is a most essential element, as we may now pretty safely calculate upon a great improvement in the quality and condition of all kinds of stock exhibited for sale during the winter months.

Although the present year's crop of wheat has turned out well as to quantity, the demand for that description of produce, both home and foreign, has ruled steady, at an advance in the quotations of from 1s. to 2s. per quarter. Barley, oats, beans, and peas, as well as flour, have tended upwards in price, with a good consumptive inquiry. The probability is that we shall see fine wheats from 4s. to 5s. per quarter higher than they now are, owing to the great falling off in the importations from the United States, in which country prices are much too high to admit of profitable shipments to England. There appears to be a scarcity of really fine English barley in the hands of our farmers. As a whole, however, the yield is nearly equal to last season.

Throughout the Continent, wheat is gradually advancing in price, with an increased demand on English account. Barley and all other articles have shown a hardening tendency. The supplies of wheat and maize on passage from the Black Sea ports are small when compared with the corresponding period last year; but those from the Baltic, as regards wheat only, are moderately extensive.

Accounts from some parts of England state that the potato disease has made its appearance to some extent. Our impression is, however, that the losses will not exceed the average of years, and that the bulk of the crop will keep well during the winter. The various markets have been well supplied, and a good business has been passing, at from 40s. to 100s. per ton. The imports from the Continent have, this season, been on a very moderate scale.

The growth of hops has turned out a full average, both as to quantity and quality. There has been a good business doing, at from 105s. to 190s. per cwt. Some large parcels of hops of the present year's growth have arrived from the continent. The produce in Germany, as well as in America, appears to have been very large. Still, prices are expected to be steadily supported for some time.

There has been only a moderate demand for all kinds of wool in the Metropolis; but, in the manufacturing districts, large quantities have been worked up to meet the great demand for woollen goods on American account. In prices we have no quotable change to notice. The supply of colonial wool now on hand for the next public sales is about 65,000 bales. The export trade in wool has received a check from the high range of money in the discount market.

The supplies of hay and straw on offer have been only moderate. The demand has fallen off, and prices have had a downward tendency. Meadow-hay is selling at from £4 4s. to £5 10s.; clover, £5 5s. to £6 12s.; and straw £1 6s. to £1 15s. per load. The quantity of hay on hand is certainly in excess of last season.

The beet and mangold crops are unusually heavy, and of fine quality. The growth of turnips, however, is a partial failure.

In Scotland the corn trade has shown signs of animation. Wheat, barley, and oats of fine quality have produced rather more money, and the value of all other kinds of grain has been well supported. The shipments to the south have been on a very moderate scale. The growth of wheat has turned out much better than was at one time anticipated.

The Irish markets have been scantily supplied with wheat,

for which the demand has ruled steady, at about 1s. per qr. more money. Barley and oats have sold on rather higher terms; but other articles have met a dull inquiry. Some large parcels of grain, especially barley and oats, have been taken for export to England.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the demand for beasts in the Metropolitan Market has been somewhat less active than in the previous week, prices have again ruled very high. The importations from the continent have been very large, but chiefly in middling condition; consequently prime stock has changed hands freely, at full quotations: otherwise the trade has been in a sluggish state, on former terms. The weight and quality of the arrivals from our own grazing districts have somewhat improved; nevertheless, really prime stock has continued scarce from that quarter.

Notwithstanding the high rates which have prevailed, the best Downs and half-breeds having realised 6s. 8d. per 8lbs., the supplies of English sheep have been again limited. From abroad, however, the arrivals have been very extensive. Selected breeds have been very firm; but inferior sheep have moved off slowly, at about stationary prices.

There has been a steady, but by no means active, inquiry for calves, at full quotations. Nearly the whole of the supplies have been composed of foreigners. The rates have ranged from 4s. 4d. to 5s. 6d. per 8lbs.

Unusually high quotations have been realised for pigs, the best small porkers having produced 5s. 10d. per 5lbs., with a steady inquiry. The scarcity of hams and bacon in most parts of the country has had considerable influence upon the pork trade. Some really good pigs have been imported from France and Holland.

The accounts from most parts of the agricultural districts in reference to the disease amongst cattle are rather more favourable; nevertheless, much alarm continues to be felt amongst the owners of stock, who have suffered severe losses of late.

The supply of food now on hand for winter consumption is considerably in excess of last year. Hay, however, though somewhat lower in price, is still selling at high quotations.

The imports of foreign stock into London during the month have been as under:—

	HEAD.
Beasts	16,344
Sheep	69,611
Lambs	1,758
Calves	1,953
Pigs	9,135
Total	98,800

October.	COMPARISON OF IMPORTS.			
	Beasts.	Sheep.	Calves.	Pigs.
1864	16,974	38,715	3,339	5,537
1863	11,560	37,521	1,129	3,965
1862	7,906	28,109	1,327	1,600
1861	5,577	42,538	1,207	5,315
1860	6,750	24,980	1,662	2,074
1859	6,026	24,323	784	878
1858	4,600	24,145	1,581	553
1857	5,819	24,102	1,993	1,233
1856	8,871	10,502	1,280	895
1855	8,136	21,137	1,358	1,501
1854	6,894	16,328	1,009	1,063

The total supplies of stock exhibited in the Metropolitan Cattle Market have been as follows:—

	HEAD.
Beasts	30,210
Cows	132
Sheep	157,840
Calves	2,932
Pigs	2,478

COMPARISON OF SUPPLIES.

October.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1864	33,540	519	137,424	2,671	3,820
1863	30,512	535	119,800	2,029	3,439
1862	28,972	526	118,789	1,855	3,286
1861	28,220	539	121,390	1,626	3,650
1860	24,240	525	125,250	2,259	2,620

The supplies of English, Scotch, and Irish beasts thus compare with the three previous years:—

	Oct., 1862.	1863.	1864.	1865.
From Lincolnshire, Leicester-shire, & Northamptonshire	13,500	11,669	10,600	8,450
Other parts of England.....	3,009	3,650	3,509	3,709
Scotland	18	28	123	53
Ireland	3,400	2,780	2,070	990

Beef has changed hands at from 3s. 4d. to 5s. 4s.; mutton, 4s. 4d. to 6s. 8d.; veal, 4s. 4d. to 5s. 6d.; pork, 4s. 4d. to 5s. 10d. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	Oct., 1861.			Oct., 1862.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef from	2 10	5 10	3 0	4 8	3 0	4 8
Mutton.....	3 0	5 8	3 6	5 4	3 6	5 4
Veal.....	3 6	5 0	3 10	5 4	3 10	5 4
Pork.....	4 0	5 2	4 0	5 0	4 0	5 0

	Oct., 1863.			Oct., 1864.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef from	3 4	5 0	3 2	5 4	3 4	5 0
Mutton.....	3 6	5 6	3 8	5 6	3 6	5 6
Veal.....	3 4	4 8	3 4	5 4	3 4	5 4
Pork.....	3 4	4 6	3 6	4 10	3 6	4 10

The tallow market has become in an excited state, and prices have advanced, although the shipments from St. Petersburg show a large increase, compared with several former years. Rough fat has risen to 2s. 7d. per 8lbs.

The supplies of meat on offer in Newgate and Leadenhall have been moderately good, and the trade has ruled steady. Beef has sold at from 5s. to 4s. 8d.; mutton, 4s. 4d. to 6s.; veal, 4s. 4d. to 5s. 4d.; and pork, 4s. 2d. to 6s. per 8lbs. by the carcass.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

AXMINSTER FAIR.—Stock was in less supply than usual. Fat beef from 11s. to 13s. a score; heifers and calves sold well at from £12 to £16; fresh barreners from 5s. 6d. to 7s. a score, two and three-year-old heifers 4s to £10, one and two-year-old heifers 4s to 4s, two and three-year-old bulls 4s to 4s. The sheep fair was well supplied, nearly 4,000 penned. Prices being lower than they have lately been, business was rather slack. Fat sheep from 8d. to 9d. a lb.; horn ewes from 40s. to 54s. each; down, horn, and cross-bred wethers from 40s. to 56s.; horn lambs from 25s. to 35s. each; down and cross-bred lambs of various ages from 25s. to 49s.

BAKEWELL FAIR.—A large show of both fat and store cattle, for which prices were rather lower. Milch cows and cows down calving were much inquired for, and sold at remunerative prices. There was a large quantity of sheep; fat sheep we quote same in value, stores rather lower. Fat lambs sold at good prices, stores rather cheaper. The supply of store pigs was moderate, and found purchasers at good prices; fat pigs scarce and dear. Good useful cart and waggon horses found customers at good quotations.

BOSTON FAT STOCK MARKET.—The supply of fat sheep, though somewhat larger than last week, was still below the average. Sales were readily effected at 9d. per lb. Store sheep were not so plentiful as last week, and trade was slow at recent rates.

BRIDPORT FAIR was one of the smallest ever seen. The few good things exhibited moved off tardily; beef 11s. to 12s., store sheep 38s. to 45s., mutton 8½d. to 9d. Some fat ewes sold by auction brought 45s. to 50s.

CAISTOR FAIR.—Some lambs made over 50s., and young tupping ewes and gimmers sold readily at prices ranging between 60s. and 70s. The gimmers of small frame and low in condition, with tolerable skins, were good to sell at 5s. to 56s. a head. Mr. Calthrop sold by auction 300 ewes and gimmers

belonging to E. Davey, Esq., of Thoresway, at prices averaging about 70s.; and a choice pen of 10 were knocked down at 98s. per head. The horses shown were chiefly those of the agricultural class, and only little business appeared to be transacted. The beast fair was thinly supplied, the better class of cattle being most in demand. Useful lots fetched high prices, and a clearance was effected early. In-calvers and fat beasts were scarce and dear. William Torr, Esq., of Aylesby, showed 10 splendid bullocks, which realised fully 9s. per stone.

CARLISLE FAIR (Saturday last).—The fear of the cattle plague has brought about a change. Instead of the Sands being crowded with cattle, as in some former years, there were very few home-bred animals exhibited, a few hundred Irish beasts constituting the bulk of the stock. Business was exceedingly dull. Irish sold at about late rates. Short-horn bullocks were offered at £14, Galloways about the same, and West Highlanders at £6 10s. to £7. The show of sheep was not large, as compared with former years, but a good business was done, especially among Cheviot ewes. Cheviot ewes 32s. to 35s. each, black-faced ewes 18s. to 24s., Cheviot lambs 14s. to 15s., half-bred lambs 26s. to 35s., gray-faced lambs 24s. to 25s. each.

ELLESMERE FAIR was small as regards cattle. Notwithstanding the prevalence of the cattle plague, most of the animals found purchasers. Pigs were plentiful.

FARNSFIELD FAIR.—Sheep fetched high prices, and considering all things the fair was regarded as a good one.

GRANTHAM FAT STOCK MARKET.—A fair show of beasts, but the supply of sheep was small. Trade was dull, sheep being perhaps a little dearer. Buyers refused to give the high prices asked, and many lots went away unsold. Beef 8s. 6d. to 8s. 9d. per stone; sheep 8½d. to 9d. per lb.

GRIMSBY STOCK MARKET.—Poor attendance. The price of meat was fully sustained at high rates. Pork in demand. 8s. per stone freely given for store pigs.

HEREFORD FAIR.—Quietude reigned in our streets until nearly midday; and the absence of cattle, with their incessant lowing and the hallooing of their attendants, precluded the possibility of even a very vivid imagination realizing the idea of its being the great Hereford October fair. Such, however, it was, held under conditions which it is to be fervently hoped will never again be forced upon us. From inquiries which we made from many of our agricultural friends, we are satisfied that the order of the Mayor for the exclusion of cattle met with very general approval. The sheep fair was very well supplied, but a large number of the animals had evidently been sent here by dealers. There were indeed comparatively few farmers' sheep, and as there were scarcely any buyers present the trade was very dull, with a slight downward tendency for very fat things—the best class ewes and wethers with difficulty realizing the respective prices of 8½d. and 9d. per lb. Trade in stores, which constituted the great bulk of the animals penned, was languid in the extreme, and many lots remained unsold. The horse fair was a small one, and comprised, as usual, animals of a very miscellaneous character. A few good horses, both for hackney and draught uses, sold well, as did cart suckers, of which the number was large, and which averaged from £8 to £10, higher figures being obtained for some of "A 1" character. The trade, though dull, was on the whole better than it has been at recent fairs. In the pig department trade was reported to be somewhat easier, but the prices asked were still very high, scarcely anything much bigger than a robust "roaster" being obtainable under a couple of sovereigns; while for stores coming in at all within the definition of useful, £3 and £4 were asked. For a dozen very strong and well-bred stores, in condition, the sum of £55 was demanded. Fat pigs, of which there were few penned, realized 7s. per stone of 12lbs.

ILLSLEY MARKET.—There was a very small supply of sheep; but the trade was heavy, and to effect sales a reduction of 1s. the head from the prices of last market had to be accepted. Wethers made 50s. to 63s., ewes 42s. to 58s., lambs 32s. to 51s.

KNARESBRO' FAIR.—There was a moderate show of fat beasts, prices being rather lower, and not many buyers at 8s. to 8s. 6d. per stone. The show of sheep on Thursday was unusually large, prices having a downward tendency, averaging 8d. to 8½d. per lb., and plenty of buyers. Fat pigs 9s. 6d. to 10s. per stone. Fat calves 8d. to 8½d. per lb. The Knaresbro'

fortnight cattle markets are to be discontinued for two months, the Justices having issued an order to that effect at the Petty Sessions on Wednesday.

LINCOLN FORTNIGHTLY MARKET.—There was a tolerably good show of fat beasts. The inquiry was slow at very little change from late rates. For sheep the demand was also quiet. Beef 7s. 9d. to 8s. 9d. per stone; mutton 8d. to 9d. per lb.

LLANGOLLEN FAIR.—The attendance was good; a great number of cattle, but few purchasers. Horses, as usual, low. Stores and sucking pigs sold well.

MAIDSTONE FAIR.—A good show of horses, many of which were sold. Handsome nags, for private harness, 40gs. to 50gs., riding ditto 25gs. to 40gs., cart horses 35gs. to 40gs., cart colts 22gs. to 30gs.

NEWBURY FAT CATTLE MARKET.—A very good supply of beasts, which sold at from 5s. 6d. to 6s. per stone; sheep at 5s. 6d. per stone. There was an average number of store pigs, and prices rather lower.

NORTH TAWTON FAIR.—There was not a large supply of bullocks, sale small. Everybody seemed afraid of the rinderpest, but no cases have been heard of in this district. There was a fair supply of sheep; business dull.

NORWICH FAIR.—There were fewer cattle than was ever known; the fear of disease has caused graziers and dealers to be more cautious than ever. A drove of prime Galloway Scots, in number near 200, were sold at from 6s. to 6s. 6d. per stone when fat. We are enabled to state every one of this drove appeared in the most sound and healthy state. On the fair stand not a single beast was offered; perhaps this may turn out a finish of one of the longest standing fairs in Norfolk. Fresh cases of the disease keep breaking out in the neighbourhood, which of course greatly injures the trade, and wholly prevents many from purchasing at either fairs or markets.

PARTNEY FAIR.—The show of sheep was smaller than usual, and business was rather slow; but prices were sustained, and nearly all were disposed of. One lot of lambs made 59s. Ewes for grazing and all useful store sheep sold well. The flock of Mr. Wright, of Aswardby, was sold by Mr. John Willson, in lots, and good prices realised.

PENRITH FORTNIGHTLY MARKET.—The show of sheep was about 2,170 head. A considerable proportion were ewes and tups low in condition. Good samples were eagerly inquired after, and these realised prices quite as high as ruled at last market. Thirty beasts were on offer; but they were a complete drug, dealers and others, deterred no doubt by the fear of the cattle plague, declining to invest at present in this class of stock. The few that found purchasers brought from 7s. 6d. to 8s. per stone; the rates for sheep being from 7d. to 8d. per lb.

ROSS FAIR.—The supply of stock was small, and the prices lower than those realised at our markets up to the present time, but firm on the monthly market held last week. Mutton was worth about 9d., and beef 7½d. per lb. Store sheep sold tolerably well; store cattle a drug. There appeared to be a little more animation in the trade for young horses, many changing hands at a decided improvement on the late low prices.

SHERBORNE PACK FAIR.—The supply of sheep was at least 3,000 less than last year (which was also a small fair), and business being transacted with the distrust which the cattle plague has so generally excited. There were a few good fat beasts, which were at once sold, but not at high prices, the best not touching 11s. 6d. The poor stock and a few very small Devon steers were entirely neglected. In the sheep fair some of the best things sold, but others hung on hand. Mr. John B. Crocker obtained 60s. a-head for some fine fat wethers, and Mr. W. Crocker sold the best pair of lambs in the fair at 44s. We quote ewes from 40s. to 42s.; trade nervous and dull at first, but somewhat better at its close, when lots of sheep bought in the morning were resold at a profit of 3s. a-head. There were a few good cart colts; some of the best brought 432.

SHEPSTON-ON-STOUR FAIR.—There was no fat stock, and only a few barren beasts, which realized from £16 to £18 per head. The supply of sheep was good, tegs realized from 45s. to 48s. per head. Mutton (wether) 9d. per lb. Ewes 9d. per lb. Store pigs, quarter-old from 25s. to 30s. each. Bacon pigs and bacon hogs were quoted at 12s. per score.

SLEAFORD STOCK MARKET.—The demand for fat

beasts fair, at 8s. 6d. to 9s. 3d. per stone. Calves scarce and very dear. Sheep 8d. to 9d. per lb.

THORNE FAIR.—Very few beasts, and little business, although in one or two quarters heavy prices were quoted. The horse fair, considering the weather, was as well as could be expected, and some good useful Irish ponies met with a tolerable sale.

TURAPSTON FAIR.—There was a fair supply of stock, and we do not hear that the present insecure state of things, raised any depressive influence on transactions in that line, heavy prices being asked and realized.

WELLINGBOROUGH FAT STOCK MARKET.—A fair supply of fat stock. Prices not quite so high as last week.

IRISH FAIRS.—BALLINASLOE: The sheep fair commenced on Wednesday morning; but a large business was done the day before, and intending purchasers that waited till Wednesday were not a little disappointed to find themselves not only forestalled, but having to pay several shillings per head over those obtained the preceding evening. It is estimated that prices averaged 8s. to 12s. a head over last year's rates for top lots. On Thursday cattle were but in slow demand, and young ones, particularly weaning calves, were all but a drug in comparison to the demand of past years, so that those who had courage to invest in this description of stock must realise considerable profits next season; and it is to be feared "beef" will rate enormously high. Mr. John Ogle, of Lysterfield, sold 100 wethers at £3, and 100 ditto at £2 16s. 3d. Mr. Harry T. Potts, sold 100 wethers at 66s. Mr. D. Lynch, county Roscommon, sold rams to the following: The Hon. Mr. Campbell, one at £20 10s.; Mr. Egan, £14; Mr. Delaney, £15; Mr. O'Rourke, £14; Mr. Evans, £16; Mr. Lestrangle, £12 10s.; Mr. Halladay, £14 5s.; Mr. Richard Kirwan, £15 10s.; Mr. Ward, £13 10s.; Mr. Eyre, £14 5s.; Mr. P. Ryan, £16; and two to Mr. Thong, at £26. He also sold a first-class hunter, by Tom Steele, to Mr. Garnett, at £80. Mr. Petres sold 20 ewe hoggets at £4 15s. to Mr. Richard Walker, and 50 ewe hoggets at £2 12s. A large number of Roscommon rams were sold at prices varying from £14 to £20. Mr. Littleboy bought 100 wethers at 70s. Mr. Patrick O'Connor, of Dundermott, sold a lot of ewes a £3 17s. 6d. Mr. H. B. Mahon, of Bellville, sold a top lot of ewe hoggets at £3 5s. Mr. Skerret, of Rathfarnham, sold 100 ewes at £4. Mr. R. O'Brien bought 1,000 wethers at prices ranging from 50s. to £3 10s. Mr. Barry, of the firm of O'Brien and Co., bought 800 to 1,000 sheep at prices varying from 55s. to £3 10s., &c. Mr. John Ogle sold 20 small heifers at £11 15s. The following is the official return of the sheep sold and unsold during the last seven years, showing the progress of the fair:

Year.	Sold.	Unsold.	Total.
1859	73,761	20,889	94,650
1860	76,386	5,275	81,661
1861	70,831	4,287	75,118
1862	57,752	14,245	71,997
1863	53,954	19,540	73,494
1864	66,324	3,525	69,849
1865	63,103	1,772	64,875

Horses were in brisk demand. Captain Seymour's horse, sold yesterday to Mr. McGrane at 300 guineas, was again disposed of to-day to Sir Watkins Williams Wynn at a considerable advance. Mr. Purdon, of the *Farmer's Gazette*, sold a colt at £120, and refused £150 for another. Mr. Browne, of Stephen's-green, bought a weight-carrying hunter at £120. Mr. Dunne, of Kildare, sold a horse at 100 guineas, and another at £75. Mr. Denis Kelly, of Galway, sold two colts at £103, and another at £109. Mr. Lauder, of the county Leitrim, sold a very handsome chestnut hunter for £150.—**KELLS:** Best beef 7d. per lb.; second class 6d.; inferior 5d. per lb. Lots of heifers, fully finished, £17 to £21 each. Three year old store cattle from £13 to £16 10s. each, according to merit; two-year-olds from £9s to £12; and yearlings and stirks from £5 to £8 10s.; and for those advanced in condition £9 to £10 each for forward stirks; two and a half year old store bullocks realised excellent prices, from £9 15s. to £14 10s. each; yearlings heifers picked up with avidity from £4 10s. to £5 10s. for little more than weanlings. Springers and milch cows were in very fair supply and eager demand, particularly springers at their dropping, which rated at the highest prices of the season. The range of prices for springers was from £11 to £22 each. The sheep fair was an average,

and mutton continued to maintain its late value. Best wether sold at fully 8½d. per lb.; ewe at 7d. per lb. for best; nothing good was left unsold. Bacon was fully 60s. per cwt; pork, 63s. per do on the foot. **PARSONSTOWN**: The show of colts and mares horses was a decided improvement on former years; only second-class animals were exhibited. Yearlings brought from £5 to £9; two-year-olds from £8 to £12, and three-year-olds from £13 to £25. Mr. Fayle purchased a three-year-old for £30. Pork brought fully 55s. to 60s. Store pigs were equally high, and brought from 50s. to 70s., according to size and quality; one month old fetched from 15s. to 20s. Ewe hoggets brought from 40s. to 50s. A very good supply of wether hoggets sold from 50s. to 55s. Lambs were in brisk demand, and brought from 35s. to 44s., and 47s. for a few. Lambs were very much enquired after, and sold from 30s. to 45s. The best lot of sheep were sold by Mr. Currie, to a Galway gentleman for £3 3s. **STROKENSTOWN**: There was a decided rise in the price of beef of a good quality. Top lots of prime heifer beef commanded from 7d. to 7½d., second class 5½d. to 6d., and inferior from 4d. to 5d. per lb. There was a large supply of milk cows and springers, considering the advanced season of the year, while the demand was eager. The highest price (given by a Mr. Rafferty) for some prime-looking milkers was from £16 to £18 10s., springers £12 to £14. The sheep fair was one of the largest witnessed in this county for some years. Some top lots of fat wethers fetched high figures, the prices ranging from 63s. to 66s. each. The top figure for wether mutton

was 7½d. to 8d. per lb., while ewes sold from 6½d. to 7d. per lb. Hoggets fetched from 48s. to 58s. each. Weighty bacon hogs were in good demand, and ranged from £5 10s. to £6 each: store pigs sold from £2 10s. to £3 10s. each; slips from 25s. to 30s. each; weanlings sold at from 15s. to 17s. 6d. each. A great number of horses changed owners at prices ranging from £16 to £18 each. Long tails brought from £17 to £25 each. Horses of a good description, and adapted for general use, ranged from £22 to £27 per head; some sporting nags fetched from £30 to £48, and up to £50. **PORTUMNA**: Two-year-old heifers brought from £9 to £13, three-year-olds from £13 to £17, and some fat cows rated at from £11 to £15. Two-year-old sheep from £2 10s. to £3. Lambs were in fair demand, at from 35s. to 45s., and nearly all exposed for sale were sold. Several lots of hoggets went from £2 to £2 15s. Milch cows were brisk; demand good, and many sold from £12 to £15 10s. **GORESBRIDGE**: Sheep scarce, and pigs very few. Fat cows ranged from £11 to £14, milch cows from £14 to £16, two-and-a-half-year-old bullocks £10 to £13, year-and-a-half-old heifers £7 to £9 10s., yearlings £5 to £7, weanlings £3 to £3 10s. Fat sheep 59s. to 60s. each, breeding ewes 50s. to 55s., lambs 30s. to 35s., store pigs 35s. to 50s. each, bonhams 40s. to 45s. per couple. **KILLENHALE** was well supplied with stock, which sold briskly. Fat cows £18 to £20, milch cows £14 to £18, strippers £10 to £12. Young stock in good demand from £8 downwards. There was a pretty good supply of sheep, which commanded a ready sale, as high as 60s. being got for some.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The unusual heat and drought of September have been nearly balanced by heavy rains and a much lower temperature in October; but the harvest being previously gathered, no injury has accrued to any outstanding corn; but turnips and other esculents have been much benefited, and the lands previously too dry has been moistened sufficiently for the reception of the autumnal sowings—some of which were effected early on the light land, and we expect to hear of many strong plants before Christmas. The potato disease, however, has been progressing, and the crop is reducing fast; while the cattle murrain, notwithstanding all the efforts of science, continues its ravages among our herds. Let us hope, however, that this visitation will be entirely removed, or receive a salutary check as the cold season approaches, or it must eventually fall very heavily on the poor. As respects the present wheat crop, accounts continue to vary very widely—say from 2 qrs. to 7 qrs. per acre; but we fear an inferior yield, as well as quality, will be found to predominate, by the samples which come daily to view. As respects prices, the month has certainly shown a tendency upwards, and the gain has been fully 1s. per qr., with a certain amount of confidence not hitherto evinced. The fact is, our prices are lower relatively than in any part of the world, inasmuch that Dantzic agents and others bitterly complain of the want of business. Our impressions given last month have been strengthened by more recent accounts from abroad, that there is less prospect of a free importation than for years past; and, should any extraordinary demand spring up for breadstuffs from the failure of animal food, we really do not know what country to look to for the needed

supplies. We have, indeed, had fair arrivals lately, as the result of orders during the rains of August, when prices were rising, but these are already diminishing; and, in spite of the rise to 7 per cent. in discount, purchases have been freely made from the Black Sea for next year's spring delivery at advanced rates; and, by telegram from Odessa, we are informed of a rapid rise there, which fully agrees with a recent statement that the deliveries there are much less than usual, and of a quality also below that of the previous year. It is equally clear that our present prospects of imports from America is poor. At Montreal white wheat had risen to 53s. per qr., and spring wheat to 43s. per qr. of 480lbs., only as the consequence of a demand from the United States, both the West and the South being largely in need. Some parts of Germany and Poland are estimated at one-third less than an average produce; while France, Belgium, and Holland have short crops. The following quotations were recently current at the several places named. At Paris the range of prices for wheat was 38s. to 43s.: at Antwerp red wheat was worth 48s., at Maestricht in Holland 44s. Hambro' quotations were much above those here, red Wahren being quoted 46s. 6d. per qr. At the Danish ports red wheat was 42s. 6d., cost and freight; at Cologne the price was 43s. per qr.; Berlin prices were 35s. to 41s.; Straubing, in Bavaria, to 36s.; Ghirka wheat, floating cargoes off the coast, to 43s. 6d.; red wheat at Venice 37s.; Montreal quotations, as previously noted, 43s. to 53s. per qr. of 480lbs. New York advices were for Chicago spring 39s. 8d., Milwaukie 40s. 6d., amber Michigan 51s. 6d., all per qr. of 480lbs.; so that English orders were as 90

much waste paper in merchants' offices, from their being considerably below present quotations.

The first Monday in Mark-lane opened on fair English and liberal foreign supplies of wheat. The show of samples, however, from Kent and Essex during the morning was deficient, and the smaller portion of this being fine went off readily at fully the previous quotations. There were some country buyers of dry Russian qualities for mixing with the new crop, and occasionally 1s. per qr. advance was realised, all fresh qualities being held very firmly. A good business was done in floating cargoes at something above the previous currency. Many of the country markets followed the improved London feeling—viz., 1s. per qr. advance. Among these were Hull, Spilsby, Sheffield, St. Ives, Hereford, Wolverhampton, and Bristol; while Liverpool was 3d. per cental dearer for the week. Glasgow prices were not raised; but at Edinburgh there was an advance of 1s. to 2s. per qr. Irish prices were little changed, but most markets were firm.

On the second Monday there was a better supply of English wheat, and very large arrivals from the Continent, chiefly from Dantzic and Russia. There were not many fresh samples sent up in the course of the morning from Kent and Essex. Higher prices were at first demanded; but millers refused to go beyond the previous rates, at which good samples went off freely. The heavy foreign arrival rather staggered the market for those qualities; but there was no disposition on the part of holders to make any sacrifice, and prices were nominally unchanged. Cargoes afloat, however, were sold at 1s. per qr. reduction. Prices were generally well supported this week throughout the country for all fine and dry qualities; but where the sale of damp parcels was forced, farmers had to take rather less money. Among the markets so described were Hull, Boston, Wakefield, and Liverpool. At Edinburgh prices were 6d. to 1s. per qr. higher; but Glasgow was again unaltered. The supply of home-grown wheat at Dublin being very short, there was a ready sale on fully former terms; at Cork there was no change.

There was much less wheat on the third Monday in the returns, but still good supplies of foreign. Very few samples came up this morning from Kent, but rather more from Essex, making together but a moderate show. Good qualities were again in fair request; but inferior were more completely neglected. A retail demand was kept up for all useful foreign, but the speculative movement was discouraged by the high rate of discount. Cargoes afloat were more in request, and the prices made exhibited some reaction on the late decline. The trade in the country this week was more decidedly upward for fine qualities, and many markets realized 1s. per qr. improvement. Among these were Boston, Birmingham, Bury St. Edmunds, Burton-on-Trent, Hull, Ipswich, Newbury, Sandwich, Aylesbury, Cambridge, Chesterfield, Huntingdon, and Leicester; Liverpool showing some improvement on Friday. Edinburgh was rather dearer for fine wheat, and Glasgow rose 3d. to 6d. per boll for American qualities. At Dublin there was an advance on native

wheat of 6d. per barrel, and foreign was held at more money.

On the fourth Monday the arrivals of English wheat were moderate, and so were those from foreign parts. The show of samples this morning from Kent was almost nothing, and that from Essex was very small; but samples not being in good condition, and factors asking more money, very little business was done. Some of the best lots were sold at 1s. per qr. advance, and the bulk was held at the same rate, but not disposed of at a late hour of the day. The foreign trade was more decidedly improved, and 1s. advance freely paid on all good Russian and Dantzic qualities, while a similar advance was realized on floating cargoes, with a good demand for spring delivery. On the same day, Newcastle-under-Lyne was 2s. per qr. dearer, and St. Ives 1s. to 2s. per qr., and almost most of the later markets were about as much dearer.

The imports into London for the four weeks were, in English qualities 34,057 qrs., and in foreign 123,383 qrs., against 31,536 qrs. English and 96,691 qrs. foreign for the same period in 1864. The general average commenced at 42s., and closed at 41s. 11d. The London average began at 43s. 7d., and closed at 43s. 10d. per qr. The imports into the kingdom for four weeks ending 14th Oct. were 2,578,537 cwt. wheat and 343,280 cwt. flour. The London exports in the same time were trifling, viz., 6 qrs. wheat and 136 sacks flour.

The flour trade throughout the four weeks has been very steady, prices not having varied throughout, the diminished imports from abroad having caused a better demand for home manufacture. Norfolks have ranged from 31s. to 33s. per sack, and the top price of town-made has stood at 43s. per sack. American barrels being very scarce, have kept at a high range, say 22s. to 27s.; and with the last high quotations from New York and Montreal, it is clear there is very little chance of many being sent on to England, there being a demand from the West and South. The imports into London for the four weeks were 73,539 sacks country and 868 sacks 13,551 barrels foreign, against 63,762 sacks English and 885 sacks 30,770 barrels foreign for the same period in 1864, showing considerable falling off in barrels.

The warm weather lasting so long, there has been very little opportunity for business in the malting qualities of barley; and so little really fine has been sent to the London market that its precise value can scarcely be given; but there has been more than enough of secondary sorts, mostly stained, and so inferior in condition that sales have been not only difficult, but oft-repeated, from the bulk proving inferior to sample. While this has been the state of the English market, there has been a gradual advance both in fine and low foreign sorts to the extent of 1s. to 1s. 6d. per qr. during the four weeks, and the market closed with an upward tendency. The imports into London for four weeks were 12,171 qrs. English and 44,213 qrs. foreign, against 10,691 qrs. English and 31,479 qrs. foreign in 1864.

The malt trade has been steady through the

The Graig and Abergorki seams are worked by level. These form the best-known coal for locomotive purposes, and the out-put is 100 tons a day, and capable of great extension.

This property is held under two leases, of which 50 years are unexpired, and the term may be renewed for 40 years of a portion of the property containing about 400 acres, on payment of a fine of £100. The royalties are much lower than usual, ranging from 5d. to 9d. per ton of 2,520lbs. The property contains the whole of the valuable beds of fire-clay and ironstone, now worked so extensively for the ironworks in Merthyr and Aberdare, and also extensive quarries of building stone.

Being the key as regards position to a large tract of minerals, the taking may be at any time largely increased on advantageous terms; but even from the present area at least 1,000 tons of coal a day may be raised, and with an additional pit a larger quantity.

The Blaenlydach Colliery consists of 460 acres, held at favourable royalties under agreements for leases, of which 56 years are unexpired. It is situated on the Rhondda Branch of the Taff Vale Railway, and about 18 miles from Cardiff. The seam is the well-known No. 3 Rhondda, or "Coffin's Seam," and is, without exception, the best bituminous coal in the district, and for coking and manufacturing purposes is unrivalled. The present yield is 120 tons a day, and may be increased.

The New Brithdir Collieries consist of 300 acres of unworked coal. The whole is opened out, and is worked by level, and yields 300 tons a day.

This taking includes 500 acres of enclosed land, with very extensive right of common, held for a term, of which 17 years are unexpired, at a rent of £252 per annum. The purchase includes a lot of 1,000 sheep, horses, and other stock.

The mining lease is for a term, of which 30 years are unexpired; the royalties are moderate.

There are 74 coking ovens of the newest and best construction upon the property, which are in constant work. The coke is in high repute for ironmaking and shipment.

The property is situate on the Rhymney Railway, and has also a communication with the Bargoed branch of the Brecon and Merthyr Railway, by which means the communication is complete with South Staffordshire, and with the ports of Newport, Cardiff, and Swansea, and the midland counties of Wales.

The proprietor has 310 waggons on redeemable agreements, spreading the payments over seven years. The majority of the waggons have been held for nearly three years. These agreements (which are of considerable value) are included in the proposed purchase.

Any contracts which may be existing, together with the trade connection of these collieries of the proprietor, who has been twenty years in the trade, are included in the purchase.

The proprietor has guaranteed to the satisfaction of the Directors that for the first five years after the formation of the Company 10 per cent. per annum shall be paid upon all the paid-up capital (taking the average of profits over such period). He will also continue to manage the whole business of the Company at a salary fixed by the Directors.

There is a sufficient plant at each of the collieries efficient to work a much larger quantity of coal than has been named.

The purchase-money for the whole of the above-named properties is £130,000, and the same is to be paid by instalments spreading over two years. The proprietor will take shares to the extent of £50,000.

The price to be paid is based upon valuations made by several well-known and experienced colliery engineers, all of which have been thoroughly verified. The originals may be seen at the offices of the Company.

The proprietor includes in the purchase the lease of offices in Bute-crescent, Cardiff, together with the office fixtures and furniture.

Prospectuses and Forms of Application for Shares may be obtained of the bankers, at any of their branches; of brokers, solicitors; of James Wright, Esq., C.E., 12, Copthall-court, London; of Messrs. Smith and Pickering, solicitors, Merthyr Tydvil; and at the Temporary Office of the Company, 10, Collumpton-street, E.C.

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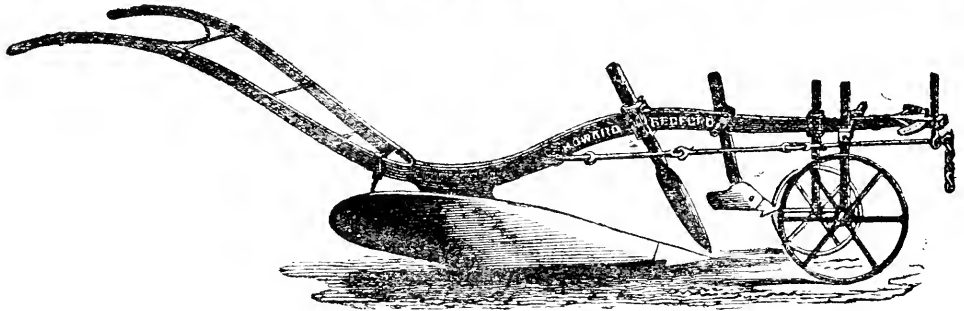
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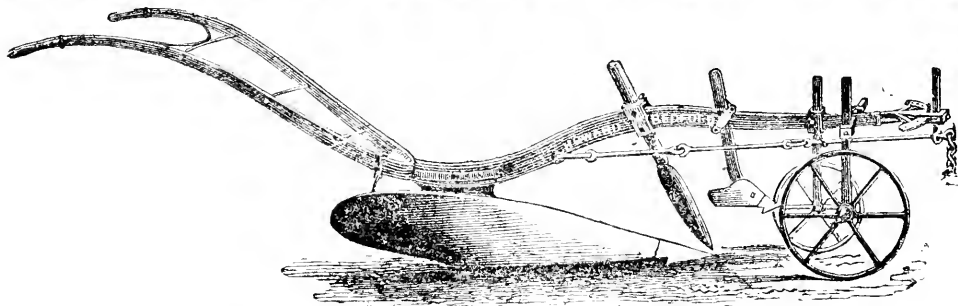
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DECEMBER, 1865.

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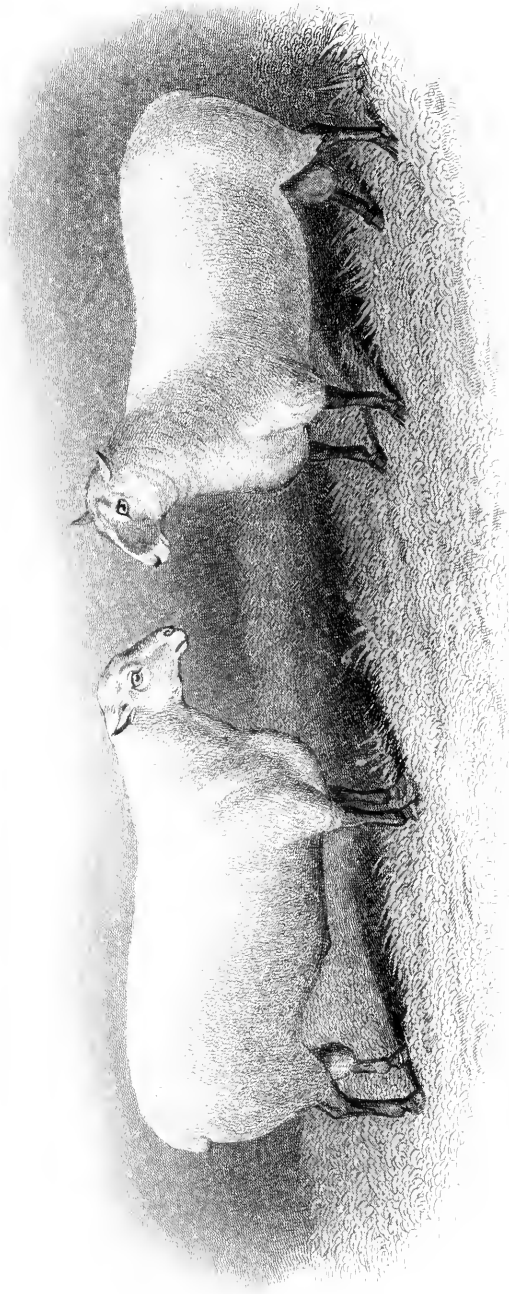
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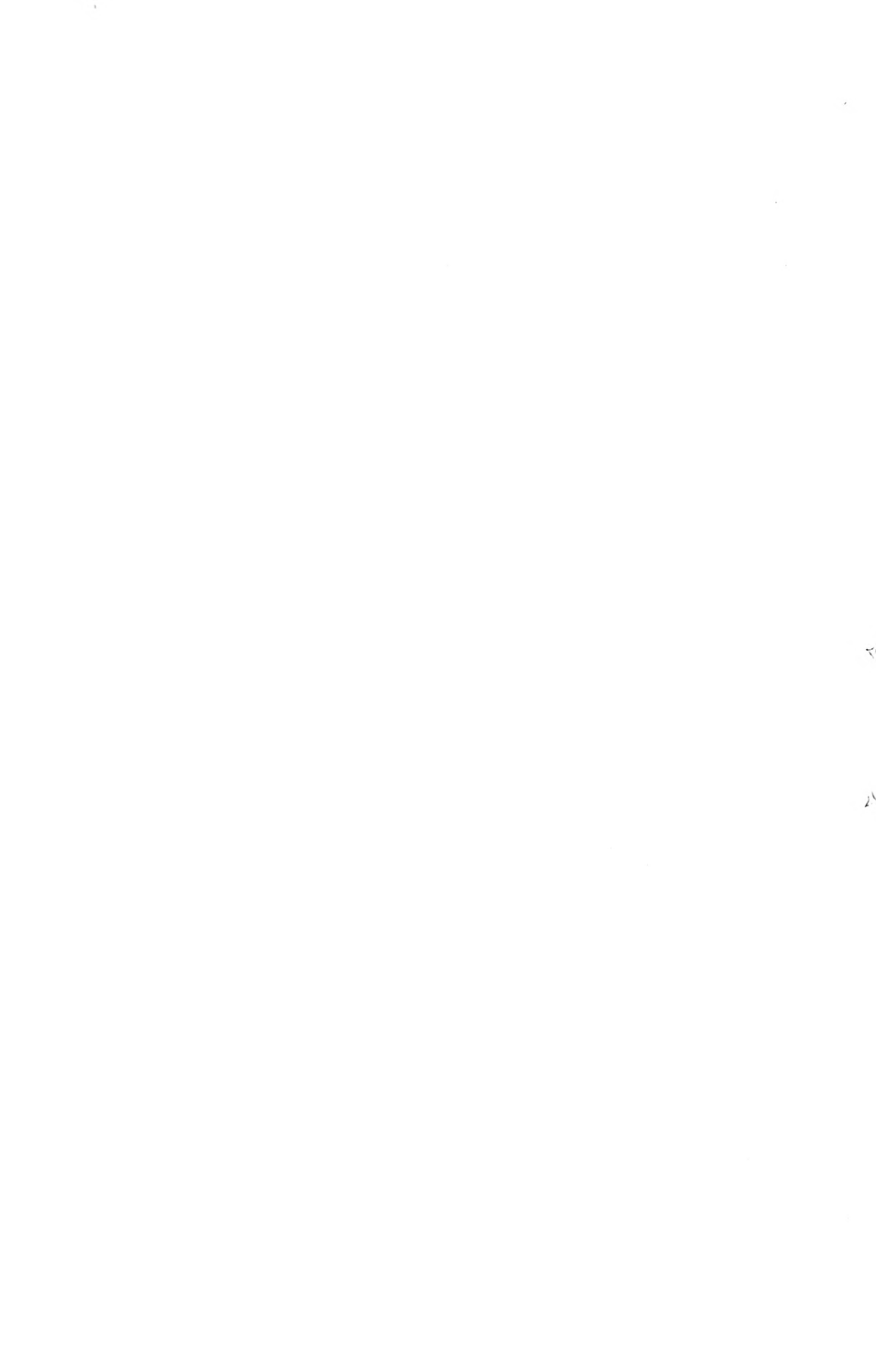
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Two sheep, one of the breed of the North of England and another of the breed of the South of England, July 1812





THE FARMER'S MAGAZINE.

DECEMBER, 1865.

PLATE I.

"ROYAL" SOUTHDOWN RAMS;

THE PROPERTY OF LORD WALSINGHAM, OF MERTON HALL, THETFORD, NORFOLK.

These two rams were first and first in the aged and shearing ram classes at the Plymouth Meeting of the Royal Agricultural Society in August last, when their portraits were taken.

The old sheep on the left, aged two years and four months, known as "Emperor," is by the Merton second prize Battersea ram, out of a ewe by a ram bred at Babraham. At the Lynn show of the Norfolk Agricultural Society, in 1864, Emperor was never noticed by the judges; but at Plymouth he was equally appreciated by the authorities and the public, being purchased on the ground by Mr. H. E. Waller, of Harrington Lodge, Northleach. Emperor was used for one season at home.

"Royal Plymouth," the first-prize yearling, is by a great grandson of Raglan, the best ram in the aged class at the Chelmsford Meeting of the Royal Agricultural Society, out of a ewe by a Norwich prize ram. Plymouth was used in the Merton flock during the past season, and served eighty ewes.

We thus wrote of these sheep, on seeing them at Plymouth: "In a very good class of shearlings, Lord Walsingham still carried all before him, with great, heavy, fine-bodied sheep, the first and second being particularly good; and, as will be seen from the prize-list, scarcely any other flock noticed amongst the many commendations. The Merton two-shear sheep were also remarkable for their fine growth and weight."

Mr. Dent Dent, in his report, as senior steward, on the stock show at Plymouth, says that "Lord Walsingham, with the shepherd, seems also to have inherited the mantle of Mr. Jonas Webb;" and certainly the success of the Merton flock has of late years been very signal, as the following list will show:

In 1851, at the Norfolk Agricultural Society: First and second prizes for shearing rams, second for shearing ewes, second for shearing wethers, first for ten ewe lambs, first and second for rams of any age. At the Yorkshire Agricultural Society: First prize for shearing ram.

In 1852, at the Norfolk Agricultural Society: First prize for shearing ewes, first for shearing wethers, second for shearing wethers, second for wethers of any age, first for ram of any age. At the Smithfield Club Show: Second prize for two-year-old wethers. At the Birmingham Cattle Show: Second prize for two-year-old wethers.

In 1853, at the Norfolk Agricultural Society: First and second prizes for shearing rams, first and second for two-year-old wethers, silver medal for two-year-old wethers, second for ewes. At the Yorkshire Agricultural Society: First prize for shearing ewes. At the Smithfield Club Show: First prize and silver medal for wethers of any age. At the Birmingham Cattle Show: Second prize for shearing wethers.

In 1854, at the Norfolk Agricultural Society: First prize, silver medal, and second prize for rams of any age; first prize and silver medal for shearing ewes, second for shearing wethers. At the Royal Agricultural Society's Meeting at Lincoln: First prize for shearing ewes. At the Yorkshire Agricultural Society: First prize for shearing ram, first for shearing ewes. At the Smithfield Club: Second prize for shearing wethers, second for two-year-old wethers. At the Birmingham Cattle Show: Second for shearing wethers, and second for two-year-old wethers.

In 1855, at the Norfolk Agricultural Society: First prize, silver medal, and second prize for shearing rams; second for ram of any age; first prize and silver medal for ewe lambs; first prize, silver medal, and second prize for wethers; first for shearing wethers. At the Yorkshire Agricultural Society: First prize for shearing ram, first for shearing ewes. At the Royal Agricultural Society's Meeting at Carlisle: Second prize for shearing ewes. At the Smithfield Club Show: Second for shearing wethers. At the Birmingham Cattle Show:

First prize and two silver medals for shearling wethers, second prize for shearling wethers; first prize, silver medal, and second prize for wethers above one year old.

In 1856, at the Norfolk Agricultural Society: First prize, silver medal, and second prize for shearling ram; first prize and silver medal for ram of any age; first prize and silver medal for wethers; first for ewes. At the Royal Agricultural Society's Meeting at Chelmsford: First and second prize for rams of any age, first and second for shearling ewes. At the Birmingham Cattle Show: First prize, and two silver medals, with second prize for shearling wethers; first prize, silver medal, and second prize for wethers of any age. At the Smithfield Club Show: Second prize for shearling wethers.

In 1857, at the Fat Stock Exhibition at Poissy, in France: First prize and Gold Medal for wethers, second prize and silver medal for wethers. At the Norfolk Agricultural Society: First and second prize, and silver medal for shearling rams; first prize, silver medal, and second prize for shearling wethers; third prize for twenty ewes. At the Birmingham Cattle Show: First prize, silver medal, and second prize for shearling wethers; first prize, silver cup, and silver medal for two-year-old wethers. At the Smithfield Club Show: Second prize for two-year-old wethers.

In 1858, at the Norfolk Agricultural Society: First, silver medal, and second for shearling rams; first, silver medal, and second for rams of any age; first, silver medal, and second for shearling wethers. At the Birmingham Cattle Show: First, silver cup, and silver medal for shearling wethers. At the Smithfield Club Show: Second for shearling wethers, first for extra stock ewe.

In 1859, at the Norfolk Agricultural Society: First and silver medal for shearling rams; first, silver medal, second, and third for rams of any age; first, silver medal, and second for shearling ewes; first, silver medal, and second for wethers. At the Birmingham Cattle Show: Second for two-year-old wethers. At the Smithfield Cattle Show: Third for two-year-old wethers, first for best extra-stock ewe.

In 1860, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearling rams; first, silver medal, and third for rams of any age; first, silver medal, and second for five shearling ewes; first and silver medal for three shearling wethers. At the Yorkshire Agricultural Society: First and second for rams of any age. At the Royal Agricultural Society's meeting at Canterbury: first for wool, second for five shearling ewes. At the Birmingham Cattle Show: First and silver medal for three shearling wethers; first, silver medal, Society's silver cup, and Innkeepers' silver cup for two-year-old wethers. At the Smithfield Club Show: Third for shearling wethers.

In 1861, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearling rams; first, silver medal, second, and third for rams of any age; first, silver medal, and second for five shearling ewes. At the Royal Agricultural Society's Meeting at Leeds: Third for ram of any age, second for five shearling ewes, first for hogget wool, first for ewe wool. At the Birmingham Cattle Show: First for two-year-old wethers, Society's silver cup for best pen of short-woolled sheep in the yard, Innkeepers' silver cup for best pen of short-woolled sheep in the yard, first for ewe. At the Smithfield Club Show: Silver medal for extra-stock ewe, second for shearling wethers, and third for light-weight shearling wethers.

In 1862, at the Fat Stock Exhibition at Poissy, in France: Second and silver medal for ten-months-old wethers. At the Royal Agricultural Society's Meeting in Battersea Park: Second and third for rams of

any age, second for shearling ewes. At the Norfolk Agricultural Society: First, silver medal, second, and third for shearling rams; first, silver medal, second, and third for rams of any age; first and silver medal for shearling ewes; silver cup for the best ram or pen of sheep of any breed in the yard. At the Birmingham Cattle Show: First, silver medal, and second for shearling wethers; first, silver medal, and second for wethers under 32 months old; first and silver medal for ewe of any age. At the Smithfield Club Show: First for ewe of any age, second for shearling wethers, second for wethers under 32 months old. At the Liverpool Cattle Show: First and second for wethers of any age; silver cup for the best pen of sheep, of any breed in the yard.

In 1863, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearling rams; first, silver medal, second, and third for rams of any age; first and silver medal for shearling ewes. At the International Exhibition at Hamburg: First and second for rams, first and second for ewes. At the Royal Agricultural Society's Meeting at Worcester: First, second, and third for shearling rams; first, second, and third for rams of any age; first prize for shearling ewes. At the Birmingham Cattle Show: First, silver medal, and second for shearling wethers; first, silver medal, and second for wethers under 32 months old; first and silver medal for ewes of any age; silver cup for best pen of short-woolled sheep in the yard. At the Smithfield Club Show: First and silver medal for shearling wethers; first and silver medal for light-weight wethers; second for wethers under 32 months old; first for ewe of any age; silver cup for best pen of short-woolled sheep in the yard.

In 1864, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearling ram; first and silver medal for shearling ewes. At the Royal Agricultural Society's Meeting at Newcastle-on-Tyne: First and second for shearling rams, first for shearling ewes. At the Birmingham Cattle Show: First and silver medal for shearling wethers; silver cup, value £25, for the best pen of shearling sheep, of any breed; second for shearling wethers; first and silver medal for wethers under 32 months old; silver cup for the best pen of shortwoolled sheep in the yard; second prize for wethers under 32 months old; first, silver medal and second for ewes of any age. At the Smithfield Club Show: First and silver medal for shearling wethers; second for light-weight wethers; first and silver medal for wethers under 32 months old; first for ewe of any age, and silver cup for best pen of short-woolled sheep in the yard.

In 1865, at the International Exhibition at Stettin, in Pomerania: First for shearling ram, and first for shearling ewes. At the Norfolk Agricultural Society: First, silver medal, second, and third for shearling rams; first and second for rams of any age; silver cup for best Southdown ram in the yard. At the Royal Agricultural Society's Meeting at Plymouth: First, second, and third for shearling rams; first and second for rams of any age; second for shearling ewes.

All these prizes were, of course, taken with Southdowns, Lord Walsingham having laid the foundation of his flock at Babraham, where his agent, Mr. Henry Woods, was for years a free bidder. Mr. Woods has pointed his experience in the fold and the yard by a very able essay on the management of a sheep, while a lecture recently delivered by him on the diseases of sheep will be found farther on in the present number.

PLATE II.

A CHRISTMAS HOLIDAY.

Perhaps no one looks forward with greater glee to a Christmas holiday, or enjoys one more, than the lad for a taste for field sports, just turned loose from school. No friends—no matter of how long standing, or how long separated—can be more glad to see each other, or give one-another a more genuine, hearty greeting, than the absentee of six long months and his brace of spaniels. The lad is no sooner home than he is away to old Dash and Fan. They recognise him in an instant, and are in

such ecstasies that Master Harry can scarcely slip their collars. There is no end or bounds to their joy, for they are up and down, about, all over him, as if they really could not believe he was one of them, whilst he looked so clean and so prim. The saddle is on old Bobby as quick as Jack Robinson can get it on, the ferret in the bag, and the jolly lot are fleeting away to the Warren, to be inseparable for the quickest time we ever spent—the six weeks of a lad from school—his Christmas Holiday.

THE SALTS OF SODA.

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

The use of the salts having soda or potash for their base has long been a moot-point with those who have laboured to apply science to agriculture. That all vegetables contain potash is well known, and yet almost all applications of its salts as fertilizers have proved of doubtful value. The same remark applies to the salts having soda for their base. They are found in far more limited proportions in plants than those of potash, and their power as manures are equally doubtful. The experiments hitherto reported in which they were employed have produced very discordant results. The only exception to this occurs in the case of those salts which contain nitric acid. The nitrate of soda (cubic petre) and the nitrate of potash (saltpetre) are of well-known value as powerful manures; but then, very unfortunately, these are the most expensive of the salts of soda and potash; while saltpetre is about 35s. per cwt. and cubic petre 15s., sulphate of soda (Glauber salts) is only worth 5s., and common salt about 1s. 6d. per cwt.; and an impure soda is very cheaply obtained by mixing together lime and common salt.

It is therefore very desirable that in so very little understood a research further inquiries should be made, and far more careful experiments instituted than those whose results we now possess. We should indeed, in all such researches, ever bear in mind the danger of arriving at rapid conclusions, in trials where vegetable life is concerned. The mysteries we encounter at every step we take should teach us caution and patience. It was after long and laborious inquiries as to the salts of soda that Professor Voeleker lately remarked, in a paper well worthy of the reader's very careful perusal (*Jour. Roy. Ag. Soc.*, N. S., vol. i., p. 302): "All soils possess a wonderful capacity of adapting or converting crude fertilizing substances into combinations fitted to support the process of nutrition of plants. The changes which soluble fertilizers undergo in contact with soils of various characters are frequently quite unexpected. The results of filtration experiments are very much influenced by the composition of each individual soil operated upon, and by the strength and even the quantity of the saline solution brought into contact with it. We must, therefore, be careful how we attempt to deduce from the results of special experiments an universal or natural law of husbandry. The results of such experiments are not without value; they hold good, however, only under the particular conditions under which

they were performed in the laboratory, and probably many more years of hard study and conscientious self-denying work of many intelligent practical observers will still be required, before our knowledge of the mysterious process of vegetable nutrition will be much advanced."

These conclusions of the learned professor may well precede his other very valuable observations, as he step by step treads carefully in his search for truth. He tells us, very truly, moreover, (I here give his own words), that "in an agricultural point of view soda and its salts are far less important fertilizing agents than potash and its saline combinations. The published ash-analyses of every variety of agricultural produce show that all cultivated plants, without exception, contain much more potash than soda. This is not due merely to accident, or, as might be supposed, to a wider and more abundant distribution of potash than of soda in the mineral kingdom, for the rule holds good even when plants are grown on soils in which the proportion of soda greatly exceeds that of potash. It matters not what the composition of the soil is on which a crop of wheat, oats, turnips, &c. is raised; invariably the amount of soda in the ashes of these and other plants will be found to be quite insignificant in relation to that of potash. Plants appear to have not only the power of taking up potash from the soil, but also of retaining this alkali, and using it for building up the living organs of the plant.

"Soda and its saline combinations unquestionably are also taken up by plants from the soil and circulated throughout the vegetable organism; but it is questionable whether soda, like potash, is ever transformed, in conjunction with carbon, hydrogen, nitrogen, and other elements, into a living organ, in which the properties of the alkali are no longer recognisable, but are as completely changed as those of hydrogen, or carbon, or oxygen when entering into chemical combination with each other.

"It is true we find soda-salts, more especially common salt, in almost every kind of agricultural produce, and their presence is commonly regarded as a proof that they are absolutely necessary for the very life and growth of our cereal and forage crops. The mere presence of certain constituents in plants does not, however, prove that these constituents are indispensable. Such a conclusion is only well established when the withdrawal of one or more elements of nutrition, or the substitution of others

in their place, is marked uniformly by an unhealthy growth and final failure. Thus we know positively that no plant can grow healthily without phosphoric acid or potash, since numerous attempts to find a substitute for them have all been totally unsuccessful. Hence our present state of knowledge entitles us to consider these two substances to be essential ash-constituents of all plants.

"On the other hand, the fact that mangolds, or grass, contain a good deal of common salt when the soil on which they are grown is naturally rich in salt, or has received a good dressing of it, does not by any means prove that salt is necessary, or even that it is, or may be, a useful manure for these crops.

"Like other soluble substances, common salt and most other soda-salts are readily absorbed by the rootlets of plants and conveyed into their sap, where they probably have important functions to perform in the living plant. What these special functions are we have yet to learn; all we know is that salt is taken up by plants, and, under certain conditions which require yet to be more clearly defined, has a remarkably good effect upon vegetation. Notwithstanding the large increase in the produce of corn or roots which has in many cases been realized by the use of salt, and its general presence in almost all plants, its base—the soda—cannot be regarded as essential to the luxuriant growth and maturity of plants. In many ash-analyses, made by our best and most trustworthy analytical chemists, soda is not mentioned at all, and merely traces of chloride of sodium are given. Ash-analyses in which soda does not occur are not isolated or exceptional cases, but may be readily found on looking over a list of such analyses endorsed by the names of Boussingault, Fresenius, Way, and other chemical authorities, who have failed to find soda in the ashes of some crops, and only insignificant quantities in others.

"It is further worthy of notice that whilst the amount of phosphoric acid or potash in our crops within certain limits varies but little, the proportion of common salt in green crops and grass, and cereals in an unripe condition, appears to be regulated entirely by accidental circumstances and to vary greatly. Thus in land like the salt-marshes the herbage is richer in this constituent than in upland districts, and on this account more relished by cattle than ordinary herbage. Again, mangolds that have received a heavy dressing of salt invariably contain a good deal of salt, more especially in their leaves, whilst roots grown without salt are comparatively poor in it. The difference between potash and soda in this respect is striking. No plant as yet has been found in which potash was entirely absent; and though a soil may contain but little of this alkali, plants have the power of extracting it and assimilating it—that is, using it for the building up of their own organism. Soda and its combinations, on the other hand, when present, occur in variable proportions in the sap of plants. Soda compounds do not appear to enter into such intimate organic combinations with carbon, hydrogen, nitrogen, and other elements, as potash and its combination. It is worthy of notice that common salt never occurs in perfectly ripe seeds, such as the grain of wheat, barley, or oats, even when the land upon which they are grown has been heavily top-dressed with common salt, and the analysis of the whole plant, root, stem, leaves, and unripe seed shows its presence in considerable quantities. Common salt, and soda-salts in general, as it would appear, circulate in the plant, assisting, in all probability, the assimilation of other inorganic or soil constituents without becoming themselves integral parts of the living plant. It may further be mentioned that Professor Kemp of Leipzig has succeeded in growing and maturing peas, beans, Indian corn, oats, barley, wheat, and other plants, in watery solutions, from which he excluded all sorts of soda. Lastly, it is well known

to every practical agriculturist that soda compounds, as a class, certainly do not belong to our most efficacious manures; and it is certain that the beneficial effects which nitrate of soda and a few other soda salts produce are mainly due to their acid, and not to their basic constituents. In the preceding remarks I have sufficiently stated the reasons which induce me to regard soda as a non-essential ash-constituent of plants. I have dwelt rather longer on this matter than may be deemed necessary, because I think the time has arrived when attention should be prominently directed to the distinction between essential and non-essential ash-constituents which I have been in the habit of drawing for more than eight years. The development of the doctrine of vegetable nutrition demands that such a distinction should be made, both in a qualitative and quantitative sense—that is to say, it is desirable that we should know positively, not only what soil constituents are absolutely necessary for the growth of our cultivated crops, but also what is the amount of each ash-constituent that has to be regarded as indispensable for bringing our various crops to maturity, and what is the amount which may be considered as superfluous or accidental."

"Although I do not look upon chloride of sodium and soda-salts in general as essential ash-constituents of plants, I am far from denying the beneficial effect which salt is capable of producing in particular cases. Indeed, my own experience leads me to admit that salt is a useful and cheap manure, which, judiciously applied, frequently yields a large increase of corn, roots, or hay, and seldom does any harm.

"On porous sandy soils, roots, especially when the season happens to be dry, are apt to pass so rapidly through all the stages of growth that their leaves begin to drop before they have had time enough on the one hand to collect atmospheric food, and on the other to accumulate mineral matter from the soil in sufficient quantity for the development of an abundant crop of bulbs. On such soils the application of 3 to 4 cwt. has given me a large increase in roots, and 7, 8, or even 9 cwt., so far from doing harm, increased the produce of mangolds by 2½ to 4 tons per acre. On the other hand, it does mischief when applied in excessive doses (and such I consider all quantities exceeding 5 cwts. per acre) to stiff wet clay soils, and soils generally which are cold, and which bring their grain, roots, and grass crops slowly to maturity, for salt has a remarkable tendency to prolong the period of vegetation. It will be seen that the value of a fertilizing agent does not always depend upon the fact that it is an essential element of nutrition; the substance which we apply to the land with a view of increasing our crops may have no value whatever as a direct fertilizer, and may, as is the case with chloride of sodium, not even make its appearance in our grain-crops, and yet it may be instrumental in materially raising the produce of wheat. Again, such non-essential salts in general may nevertheless play an important part in the nutrition of plants by assisting the solution and uniform distribution of fertilizing constituents which occur in the soil in a sparingly soluble or insoluble condition. It is well known to chemists that chloride of sodium exercises such a dissolving action upon several bodies, and thus it is not too great a stretch of fancy to assume that it will act beneficially in the field by dissolving and rendering available earthy fertilizing constituents which without its aid will remain in an inert condition for a long time. The remarkable changes which solutions of salts of *potash* undergo in passing through different soils naturally lead us to suspect that similar changes take place when dilute solutions of *soda-salts* are filtered through a soil."

The experiments which the Professor made upon the absorption of salts by various soils, all seem to show the

inferior attraction of these soils for the salts of soda. The experiments were made by mixing 3,500 grains of each soil with 41.52 grains of the salts, dissolved in 4 gallons of water. The results he obtained, first with a calcareous soil, to give his own words, showed—that 3,500 grains of this calcareous soil absorbed only 2.8 grains of soda contained in 5.28 grains of chloride of sodium, or 1,000 grains absorbed only 0.8 of a grain of soda. If we compare this result with the action of arable soils upon potash-salts, we find that the soil has far less attraction for soda than for potash. For instance, this same calcareous soil, of which 1,000 grains in the preceding experiment absorbed only 0.8 of a grain of soda, in a similar filtration experiment made with chloride of potassium, absorbed 3.578 grains of potash per 1,000 of soil. This, no doubt, is one of the reasons why soda-salts as a class are far less energetic manures than their corresponding potash-salts. If a soil is manured with common salt, and by the action of rain a dilute solution of salt is produced, a good deal of the salt will remain undecomposed in the ground. In the moist soil the salt exercises but a weak influence, which, however, produces a sufficiently marked effect upon the produce in the long run."

Under similar circumstances 1,000 grains of a stiff clay soil absorbed 1.057 grains of soda. 1,000 of the soil of a fertile sandy loam absorbed 0.62 of a grain; 1,000 of the soil of a pasture, 1 grain; 1,000 of a marly soil, 0.99 of a grain; 1,000 grains of a sterile ferruginous soil absorbed 0.62 of a grain.

We have, however, the results of certain experiments, made long since, which strongly incline us to think that Glauber salt (sulphate of soda) is worthy of a more extended trial as a manure than it has hitherto received. For instance, in the experiments of Mr. James Wilson, of Erskine, on grass-growing upon "a very good light soil," the following was the produce of hay per imperial acre:

The soil, simple	2 tons	0 cwt.
120 lbs. of saltpetre	2 "	17 "
120 lbs. of cubipetre.....	3 "	0 "
120 lbs. of Glauber salt....	2 "	12 "
340 lbs. of gypsum.....	2 "	5 "

And in some experiments of Mr. W. Fleming, of Barochan, on winter rye, the various dressings being applied on the 14th of April, on a tilly soil which had been trenched, and produced potatoes the previous year, the following was the produce per rood:

Soil, simple	—	Straw. Grain.
Muriate of ammonia (sal-ammoniac) 5 lbs.	1,924 lbs.	3½ bush.
Nitrate of soda	40 "	1,664 "
Lime and potash	40 "	1,544 "
Sulphate of soda	40 "	1,152 "

It would appear from other experiments of Mr. Fleming that sulphate of soda (Glauber salt) may be a valuable dressing for leguminous crops. He remarks, "The first dressing was applied the 4th of May on some beans on a border in the garden; the drills that were dressed quickly took the lead of the others. There was no alteration of colour, but greater strength, and they *tillered wonderfully*. There were five or six stems from every seed sown, and the pods were larger and more numerous, and the beans in the pods a great deal larger than the same variety undressed. It was also put upon some of the ridges of the beans in the field, and with the same effect, and gave a very large crop. Upon peas in the garden it appeared to add little, if anything, to the strength of straw, but those that were dressed had a far greater number of pods, and those better filled, and the peas of a better flavour, and *it seems a valuable dressing for all leguminous crops*. When sown in the drills along with the peas, it nearly killed every one of them; while

the same quantity put on as a top-dressing to some drills next to them (where the peas were two inches high) did no injury."

Then we have the fact that not only sea-weeds, but the *ashes* of sea-weeds, are a powerful manure; and these ashes abound with the salts of soda. In 100 parts of sea-tangle, Hodges found:

Sand	2.7
Potash	8.2
Soda	25.8
Lime	5.2
Magnesia	8.5
Chlorine	11.7
Phosphoric acid	5.4
Sulphuric acid	20.2

Now the ashes of these sea-weeds are extensively employed in the Channel Islands. Mr. C. P. Le Cornu, in his prize essay on the agriculture of these islands, remarks upon the Isle of Jersey (*Jour. Roy. Ag. Soc.*, vol. xx. p. 40), "Wheat is sown in most cases after potatoes, parsnips, or carrots; in this case the land is clean, and requires no preparation beyond manuring. The manure employed is generally *vraic* ashes, *i. e.*, the ashes produced by the burning of dry sea-weed. Sea-weed is collected in great abundance on the coast, and dried for the purpose of burning. If the land be rich, as in most cases it is, having been highly manured for the root-crops, 2½ tons per acre of ashes will be deemed sufficient. A few days before ploughing these ashes are carted from a dry place (in which they are stored and kept as free as possible from the action of the atmosphere) to the field, where they are spread evenly on the surface.

And the use of these saline ashes as a manure is one that has prevailed from time immemorial, for in a work upon Jersey, by the Rev. Philip Falle, published in 1694, he observes, that "Nature having denied us the benefit of chalk, lime, and marl, has supplied us with what fully answers the end of them in husbandry—it is a sea-weed, but a weed more valuable to us than the choicest plant that grows in our gardens. We call it *vraic*, in ancient records *veriscum*, and sometimes *vrccum*, and it grows on the rocks about the island. It is gathered only at certain times appointed by the magistrate, and signified to the people by a public erier on a market-day. There are two seasons for for cutting it, the one in summer, the other about the vernal equinox. The summer *vraic*, being first well dried by the sea-shore, serves for fuel, and makes a hot glowing fire; but the ashes are a great improvement to the soil, and are equal almost to a like quantity of lime. The winter *vraic* being spread thin on the green turf, and afterwards buried in the furrows by the plough, it is incredible how with its fat unctuous substance it ameliorates the ground, imbibing itself into it, softening the clod, and keeping the root of the corn moist during the most parching heats of summer. In stormy weather, the sea does often tear up from the rocks vast quantities of this weed, and casts it on the shore, where it is carefully laid up by the glad husbandman."

The Jersey and Guernsey Agricultural Society confirmed this report of the excellent effects of sea-weed ashes, in 1797, in their report to the English Board of Agriculture, when they observed, "It is judged that a chabot (half a bushel), strewed over a perch of ground in winter, or the beginning of spring, will be a sufficient manure. Our labourers are unanimously of opinion that it gives a full ear to the corn, and prevents it being laid—those who have any *varech* to sell may at all times get a chabot of wheat for a quarter or six bushels of *varech*." (*Com. Board of Agric.* vol. i. p. 216).

This very extensive use of the ashes of sea-weed (which we have seen contain more than one-fourth of their weight of soda) seems to support the conclusions of those

who have advocated the employment of a mixture of common salt and lime. This manure is made by mixing, in a dry state, two-parts of hot lime with one part of salt. After they are well incorporated, the lime and salt should remain undisturbed under a dry shed, or well covered with sods for two or three months. The salt in that time is gradually decomposed—carbonate of soda and muriate of lime, a deliquescent salt, very likely to be useful on dry soils, are produced. This mixture of soda and muriate has been often successfully employed as a manure from almost the days of the alchemists, the last of that

fraternity, the celebrated Glauber, describing it as an universal medicine for vegetables.

We may then, on the whole, fairly conclude that we have much still to learn with regard to the agricultural value of the salts of soda. They form a valuable class of which two, cubic petre and common salt, are of undoubted service to the agriculturist; and if we are in doubt as to the uses to the farm of two of this great group of salts (Glauber salt and carbonate of soda), it is probably for want of that information, as to its mode of application, which future careful examinations may afford.

THE HERDS OF GREAT BRITAIN.

CHAPTER XLVIII.

THE EDENBRIDGE AND COURTLANDS HERDS.

The hop season was over. One or two old hop hags were left half-drunk by the station-door, with their unkempt hair straggling over their faces, and shaking their fists impotently at the railway policeman; but the rest of the pickers had tied up their bundles and their potato kettles, and departed, singing and shouting, to their London lair. There were no charms for us in the withering bine bundles, which some use for straw, some for thatching, and others "win" for fodder; and we were not sorry to quit Kent. Our last halt was at Edenbridge, in the parish of Westerham. Mr. Murton Tracy's residence is rather more than a mile from the rail, and just at the foot of the southern slope of the line of the "green sand" hills, which run parallel with the great chalk range, or the "backbone of the county." From that fir and juniper-covered height, the Wealds of Surrey, Kent, and Sussex seem to spread themselves out in all their fatness; and the oak flourishes, like a "weed," in every hedgerow. The situation of the Red Hill farm is remarkably warm and sheltered; and the ground gradually falls from it down to the Eden, one of the principal sources of the Medway. Even in the eyes of The Faucy, whose faces were generally Kentwards on the Tuesdays of their prime, Edenbridge has an historical value, as the spot where poor Tom Sayers met Dan Collins twice in one day, with Tom Spring and the veteran Vincent Dowling to look on. The farm of Red Hill comprises about 200 acres, of which fully half is devoted to permanent grass. The soil is very much intermixed—sandstone hills on the higher part, and weald clay below. It grows fine wheat—in some years 65lbs. to the bushel—and is favourable for clover, but not so well suited to oats, unless grown after turnips. The course is generally a six-shift: fallow or green crop, wheat, seeds, oats, pulse, wheat. A portion of the pulse-tillth is devoted to a summer fallow which in autumn is sown, like the rest, with wheat. The portion which was fallowed is well manured and deeply ploughed, and then stirred and worked with the scarifier, as early in March as it will bear the horses. A little more scarifying and harrowing-in of dung will prepare the ground for mangolds and swedes, which take exceedingly well when put in with some artificial manure; but this plan was only arrived at after many unsuccessful trials. A great deal of cider is made from the commoner sorts of apples; the hops, Goldings and others, are of fair quality; and Dorkings are the prevailing poultry. The cattle of the district are ordinary unpedigreed shorthorns; and suckling calves seems their great milk mission. These calves are bought by dealers at Croydon from the dairies in and round London; and three batches are often suckled in the year, of which the

third, when weaned, forms part of the regular stock of the farm.

The first pure shorthorn that ever came to Red Hill was Rubini (15210), a handsome roan bull, which was bred by the late Sir John Lubbock, whose stock, in which his widow has always felt a great interest, has done so much good in North Kent. The Hendon sale, in 1855, furnished Cleopatra 2nd, by the Earl of Dublin (9180). With her, came Douglas (12714), a son of the 680-guinea Duke of Gloster and Dolly Varden, of the Gwynne tribe. Snowberry and three others then joined company from Sir John Lubbock's; and so did Olga and Florinel, from Sir Charles Knightley's; Caroline, by Second Cleveland Lad, from Mr. Harvey Combe's; and Ratifa, from Mr. Marjoribanks. These cows, or their produce, were dispersed at the first sale in '50. Two females and four bulls of the Cleopatra tribe were then sold; and Mr. Noakes gave 78 guineas for Cleopatra 4th. There were several other good prices, and among them Snowberry (Mr. Rich, 55 guineas). Florinel, which had been bought at Sir Charles Knightley's sale for 60 guineas, made 10 guineas more to Mr. Hales's bid; Ratifa (65 guineas) became Mr. Christy's; and her daughter, Miss Butterfly, the top lot, passed, at 100 guineas, through Mr. Sheldon's hands, to the Americans, and was shipped with Grand Duke of Oxford (16184).

Sir Charles Knightley used to say: "Two things are certain when I die—those Radical Northampton shoemakers will never put up their shutters for such an old Tory; and Mr. Stratford will have 'a small but select herd of Shorthorns' to sell." And so it is. Men may weary of hunting and of racing, but the lover of Shorthorns is as staunch to the death as the fisherman or the cockfighter; and hence Mr. Tracy determined to reserve the two Cleopatras, as he dearly loved the Earl of Dublin and the other triple Princess cross, in their pedigree, through Bellerophon (3119), Waterloo (2516), and Young Wynyard (2859).

Before grass had time to grow in the other stalls, he was off to a sale in the neighbourhood, and brought back Quaint, Geranium, Queen, and Quartz, the latter two both daughters of Quaint, who went back into the Beauty of Young Barmpton (3088) sort, but was spoilt by her sire Castor (17512). Gradually lots from Lenton, Milcote, Crawley, and Farnboro' came in, and Sweetheart 3rd (who inherits four direct crosses of Favorite, through her sire Daybreak), and her grand-daughter Starlight, established the Sylph by Sir Walter sort in Kent. Through Daybreak (11338), Mr. Tracy had also that Earl of Dublin dash once more, which he has so jealously reserved in his Cleopatra 3rd by The Baron. The latter bull by Baron Warlab, from Bon Bon, was bought

from Mr. Antony Cruikshank for 150 gs., specially to cross the Sweethearts. He had been sold twice before: once for the same sum by his breeder, Mr. Challoner, of Kingsfort, after winning a first prize at Dublin Spring; and again for 155 gs. as a two-year-old at Hendon. It was cheap enough for such a hardy bull, who had also done such yeoman service for Sittyton. He came from the county of Bon Accord to meet his own blood, as Cleopatra 2nd was in calf to him with Cleopatra 3rd, when she was bought at Hendon. Mr. Barnes's Duke of Leinster (17724), a pure Booth bull, was also used in the herd. He was hired by Mr. Waldo, of Stonewall Park, about five or six miles away, and came subsequently for half a year into residence at Red Hill, where The Marquis (20961) and his sire The Don (18980), one of them from Cleopatra 3rd, and the other from Sweetheart, had held the ground in turn.

With the exception of The Marquis, the Cleopatras and Sweethearts were all reserved when the second sale took place in July, 1865, and, owing to this fact, and the general election, the average was very low. Mr. Tracy has thus fairly chosen his line of blood; and we found him with fifteen in September, five males and ten females. Cleopatra 3rd, by the Baron, has been a regular breeder; but with the exception of Cleopatra 5th, by the Duke of Leinster, they have all been bulls—to wit, Duke of Albemarle and Last of the Barons. Both the "Thirds" were sent to Duke of Leinster at Stonewall Park; but Sweetheart missed to him. Despite this mishap, which was rectified in due season, this cow is the foundress of a prolific tribe, which she began with twins, Sweethearts 5th and 6th, by Mameluke. The Marquis (20961) next arrived; then roan twins again to The Baron—Baron of Rathcool, and Sweetheart 9th; and, lastly, another Baron daughter, Sweetheart 11th. Sweetheart 5th seems to inherit much of her dam's fertility, as she has already produced three calves—Sweetheart 7th and 10th by The Baron, and a bull-calf by Duke of Leinster; and Sweetheart 6th has also had a Duke of Leinster bull-calf and a Baron heifer. Mr. Tracy is crossing the two lines, and uses Duke of Albemarle and Last of the Barons from the one side of the house, and Baron of Rathcool from the other. The family tree is rather a difficult one to master, as Duke of Albemarle is one-fourth Sweetheart 3rd on his sire's side, and the Baron's blood forms such a strong catenary chain between the two families. Still Mr. Tracy apportions the dams very carefully: Sweetheart 3rd and her twin Mameluke daughters the 5th and 6th were all in calf to Duke of Albemarle; and a double cross of the Baron was in process of achievement by putting Baron of Rathcool to Cleopatras 3rd and 5th, and also to Sweetheart 7th.

But even Shorthorn heraldry will pall, and we wanted to be "in the open." That doesn't just seem the word, as the meadows here are very snug, and surrounded by high hedges, backed by regular Kentish coops, and fringed by the Ontarian poplar, with its green and yellow hues. Sweetheart 5th, a red roan Herd Book heroine, was one of the first we met. She is a very nice, useful cow, shorter in the leg and deeper in the flesh than her twin sister; and somewhat recalling Mr. Douglas's Rose of Sharon. The old cow herself is a short-legged white, and beginning to give slightly in the loin; and we looked with still greater interest for the deep-middled Cleopatra 3rd, a healthy hardy old dame, and the first shorthorn that Mr. Tracy ever bred. Cleopatra 5th is a red and white, of great substance, and with a well-turned breast; but except on that point, she has not exactly sacrificed to The Graces. A gay growthy heifer, with a nice picture head, proved to be Sweetheart 7th. Sweetheart 8th did, perhaps, more for the hand than the eye; and the squarey deep-fleshed roan, with no "hole for your hat" behind the elbow, was

Sweetheart 9th, the twin with Baron of Rathcool. From thence we went to the right, past the marl pit, or miniature Devil's Punch Bowl, on whose margin 50 South-down widders were browsing, and so round into the yard.

The hops had been dried in the oast-house (which we once heard an Alliance man term "a hypocrite under a eowl"), and departed to the brewer in the bags with the black-horse brand of Kent, so we had no pencillings to reward our search. Two yearlings, Sweethearts 10th and 11th, the produce of dam and daughter, were in the boxes below, of which the 10th especially was a nice red, level below and above, with a good Booth rib, and deep in her flank and flesh. Near them were the two Duke of Leinster bull calves, from Sweethearts 5th and 6th, the former more level, and the latter perhaps the best in his hair and handling. Duke of Albemarle looked full of constitution; and Baron of Rathcool has a nicely laid shoulder and pleasing head. The last of the Barons (and singularly enough, from Cleopatra 3rd, by the Baron), a clever calf, for which a long price has been refused, next showed his little Roman head, "set on like a button," as they say in Scotland; and then we ruminated over the skull of the old Baron, of whose well-spent lifetime we had such solid proofs, both here and at Sittyton, and who died of bronchitis, when "the wind was in the east," early in the spring of last year.

Those who wish, like ourselves, to combine a peep at this Kentish herd with the only Royal prize shorthorn herd in Sussex, must either ride or trudge it for thirteen miles over the Ashdown Forest, or go round by Redhill to the East Grinstead Junction, which is about seven miles from Courtlands. Mr. Sharpe's shorthorn love is of no recent growth. He was born in Durham more than fifty years since, and soon caught the county spirit. In his boyhood he had listened with eyes and ears to Old "Jacky Hutcheson's" praises of Sockburn Sall, and longed to realise the aspirations expressed in "Jacky's" burning lyric:

"Thick in the rump,
Small in the tail,
Good for the butcher
As well as the pail."

Willie Stephenson, the breeder of Belvedere, was also walking the earth, and Tommy Bates, Tempest, Wood, Major Rudd, Kit Mason, and the Robsons were still true to the cause of the Durham, and hence these early Glassynook impressions have never been lost. His first essay with a herd was at Hewels Field Court, near Chepstow, some sixteen years since. It consisted of some heifers, partly of Booth blood, a few Gloucestershire crosses, and a Maynard bull. During those eight years, he won some prizes at Coleford and Chepstow, and when he parted with the herd in '59, and left for the Brazils, he sold some of his best cows with their calves at 50 gs., and a yearling bull beyond that price. He returned when his railway contract was fulfilled in '62, and buying back two cows of the old blood from a friend, he purchased Courtlands and started afresh. This estate, of which he has 450 acres (about half of it grass) in his own occupation, is on the old Sussex sandstone, with a clay top, and is very good bean and wheat land. Mangolds and swedes have also done well, while barley and common turnips put in late are generally inferior.

The herd, which now numbers about sixty, commenced with the purchase of six cows and heifers (among which were Lady Windsor and Clytemnestra) and a bull, The Wizard, by private contract from Mr. Stratton. Mr. Hales of North Frith's sale added three, and Mr. Jonas Webb's five, including the 400-guinea bull Lord Chancellor; and five from Mr. Noakes's and four from Mr. Maynard pretty nearly made up the first two-dozen. There

was many a bitter blank among them in the breeding line, but the result both at store and Christmas shows has far outweighed those losses. Mr. Sharpe has always liked showing, and he has now six or seven going on for the next year's campaign. This year his career was cut short by the dread of the rinderpest, or else Lord Chancellor and a bevy of fair dames would have begun at Doncaster and taken a regular round on that Northern circuit. Now that the great Towneley, Douglas, and Gunter lots are no longer seen there, and Lady Pigot is not in her old strength, the need of some new blood is sorely felt in the prize ranks.

Mr. Sharpe may be said to be making his stand with Lord Chancellor (for whom, as well as Miss Emily, the late Mr. Clark Irving "sent him along) upon the Abraham, the Maynard, and the Cherry blood, the latter of which comes in through Bolden's Cherry Duke 3rd, in Elegant and Lady Bountiful. The calves all suck, and as it was important to establish the herd through tail female as soon as possible, Mr. Sharpe determined to test the French exception theory. Respecting the English one, whatever it may be, which was so solemnly contended to representative breeders of different countries, we have heard but one comment on authority: "*We should be afraid to try it except on a donkey.*" As the French one was open to no such objections, all the Courtland cows and heifers were put to just as the season was beginning to go off them; and out of the sixteen so experimented upon, not one has failed to produce a heifer calf. John Richardson, the herdsman who graduated under John Ward, when he was at Aldborough with Mr. Wetherell, was a great sceptic at first; but even his patience had been exhausted, as bull-calf after bull-calf came, and he longed for a crop of "ladies in red" with the white Chancellor mark on each side, just behind the shoulder.

Mr. Sharpe has always made ventilation a great point, and his principal house is built of corrugated iron sheds in three distinct rows, and with very open circular roofs, the middle one of which merely covers the passage between the boxes. Three Lord Chancellor bull-calves were there—a gay-looking roan from Cleopatra 4th, a red from Miss Emily, and a roan from a Windsor cow, and the thickest of the lot. Elegant's heifer-calf Lady Elegance had "Lord Chancellor his mark" in perfection, and did him much credit, and so did another red from Maynard's Heiress. This bull has quite driven The Wizard by Young Windsor into the background; but, when we had caught a glimpse of that fine, speaking head over the door, we were sure that there was a world of good behind. He has lived quite an anchorite life since the rinderpest, as, of course, Mr. Sharpe would allow no strange cow near the place, and his Lord Chancellor reversions are small indeed. At Toubridge Wells two years since he beat a large field of bulls; and his good flesh, very short leg, and specially neat hind leg and deep twist would have carried him farther, if he had not rather run to gut, and unsettled his top thereby. The Lord Chancellor has a very sweet but not so masculine a head, and is a little plain at the putting on of his tail, and not quite first-class in his handling. Still, we may "wander many a weary fit" and not find, take him altogether, a much neater bull. Lord Strathallan was once very much inclined to send Fosco to Plymouth; but, fearing the long sea voyage from Glasgow to Bristol, he did not enter him, and he was specially kept for Doncaster. The meeting at either place would have been a very interesting one, as the white was a second last year to Forth and Van Tronp at The Royal and The Highland Society, and a vastly improved bull since then. The red has been shown four times, and never missed a first prize; and at Toubridge Wells he met and beat Mr. Betts's Third Duke of Thorndale,

The cows were principally in the park. Among them were Lady Richmond by Oxford 2nd (18507), a regular slasher in point of size, and her own sister Heiress, "always a great favourite of Mr. Wetherell's," on John Richardson's authority; and when we have said that, we have said enough. She is a daring, stylish-looking lass, and we can quite believe that she jumped over a wall at the sale. Lady Duicé, of the Dodona tribe, stood appropriately enough under an oak, and in colour must have been very similar to "t'auld yellow cow," on whose merits breeders delighted to "set off" old Anthony Maynard in a cozy evening's chat. Bonny Star by Oxford 2nd is a very clever roan; and near her stood Miss Emily, one of those buxom five which Jonas Webb showed side by side in the cow class at Battersea, against Queen of the Ocean and Pride of Southwicke. She has well repaid the 100-guineas which was paid for her; and, both for her fine deep old stamp and "for the man who bred her" (as our friend Easton said, when he showed us The invalid Englishman), Mr. Sharpe holds her in no slight honour. A country gentleman, who bought the old Taghioni coach, said it was worth any money to him just to sit in the coach-house of an afternoon and smoke a cigar over it; but Miss Emily pays better interest than that, as she has had two calves since the sale, and is just calving again. Sunshine, from Mr. Noakes, is a roughish cow, but a good milker; and we pass on by British Queen, of the Celia tribe, to Bloomer, a relic of the first herd, and a proof that Mr. Sharpe's tastes have quickened with years.

Cleopatra IV. and Daffy Gwynne were both tied up to feed; but they are not destined to follow in the Christmas footsteps of the white (Lady Windsor) and the roan (Clytemnestra) cows of last year. The pair were started off first to Rugby for the All-England prize; and there the white was first, and Lord Spencer's heifer, which had taken first Oakham honours, behind her. Proceeding onwards from the haunt of Mr. Newdegate and his "Conservative Club," the pair tried their fortune at Bingley Hall, where the cards were shuffled, and the roan was first in her class, the white third and Lord Spencer's commended. The judges must have been very sweet on the roan, as they put her before everything in the classes for the *Shorthorn* Cup. Mr. Sharpe was surprised at his good fortune, as, if he had been obliged to declare which he would win with, he would have said the white, which had been to the Royal Cornwall and the Bath and West of England as a store cow, and come home each time with the first rosette. In conformity with this opinion, he had selected her for the Smithfield class, and put the roan among the extra stock. Both were first: but the white was reserved for the cup for the best female in the yard. And so it was at Leeds, where the white met and settled the prize cow at York and Darlington, and the roan was not even mentioned. Their continued successes for nearly three weeks spoke volumes for Richardson's training, as, if they are not very fit when they start (to use Mr. McCombie's expression), "they melt to nothing in the rail." However, when they were both killed at Chesterfield, the roan cut up about three stone the best; and £150 and the medals were their fruits of travel. Many breeders have tried all their lives, and failed to do as much, much less follow it up with a Royal bull first within the next half-year. No wonder that Mr. Sharpe is as fond of Shorthorns as Mr. Blenkirton of his thoroughbreds; and in point of enthusiasm, it would be hard to "whip them apart."

The Stable Mead was the home of the prize-takers. Elegant, of the beautiful breast, by Cherry Duke 3rd, from Fuchsia, and bred by Mr. Noakes, was only three in May; and Mr. Wood's Corinne had thus 21 months

the pull over her at Plymouth, where Mr. Stratton's Diadem (3 years 5 months) separated them in the cow class: she had taken a first and two seconds before that; and well she might, as seven cows out of the ten were mentioned at the Royal, and the judges speak of the class as "a very good one, in which we had great difficulty in arriving at a decision." Lilac by Warwick (19120), from Lily of Windsor (another of Mr. Stratton's), has been a fair winner—third at the Royal Cornwall, third at the Bath and West of England, and commended at the Royal. Read second for third, and English Emily, a very thick and snug daughter of Miss Emily, and Englishman had the same public career to boast of. Beyond them, among a field of yearling heifers, we found the first Lord Chancellor calf

that was ever dropped at Courtlands; while Matchless, Stately, the other vestige of the first herd, Lady Ducie, Baby, Countess, &c., had all contributed their quota.

But night was deepening over the Surrey hills; a mist was curling steadily up that long valley to Lewes, past Uckfield, with its Johnny Kenward, and all those brisk hop-bettors, who thought backing or laying against the duty each Monday in the season far before any horse-racing. *Bradshaw* was equally inexorable; and through deep lanes, shaded with ash and beeches reddening to the hue of the best fox that ever stood for three hours before Old Tom of the Old Surrey, we reached the Junction once more.

H. H. D.

ON THE WINTER FEEDING OF FARM STOCK.

It is not proposed in the accompanying remarks to advocate high feeding, or recommend to farmers the imitation of gentlemen or amateurs who farm for amusement more than ultimate profit, but simply to review the ordinary methods the rent-paying farmer has at his command, and must have recourse to, for the purpose of bringing his working, breeding, and store stock economically through the winter.

There can be no greater mistake committed by a tenant farmer, whose sole dependence is his farm, and who, consequently, has to pay his rent, taxes, butcher's, baker's and other bills out of its proceeds, than that of imitating too closely the methods of feeding followed out by the wealthy owners of prize animals, whether horses, cattle or sheep.

Full feeding is an admirable thing, and, when confined to the varied articles of food grown on the farm, can scarcely be carried too far: the more grown and consumed, the return in hard cash, of course, also becomes greater; and the manure-heap, the primary source of all agricultural wealth, increases in like proportion.

But when a working farmer, who has really a taste for his business, and an eye for not only a useful but really a handsome beast (a gift which many of them possess) begins—for the sake of having the nicest and best-managed, and best-looking stock in the neighbourhood—to spend large sums on purchased food, he gets into a dangerous position.

Although not generally admitted to be a fact, it is not the less so, viz., that it is quite possible to feed all descriptions of farm stock beyond the paying point; or, in other words, they may be made to consume such a quantity of expensive food that the margin will not only be on the wrong side, but a considerable way down. A case in exact illustration of this point came under our observation a few years ago. A tenant-farmer of active and industrious habits, having a capital knowledge of cattle and their management, and his devotion to his business approaching almost to enthusiasm, changed his system, which was a six-course one, and, in accordance with what was thought, in the face of declining corn prices, to be the requirement of the times, grew less corn, throwing a considerable portion of the arable extent of his farm into permanent pasture. For the purpose of stocking this increase of pasture, he purchased twenty-two milch cows, all picked animals, as nearly even as possible, and the very best of their sort that money could procure. He took great pride in his dairy stock, and justly, as they were beautiful animals, and the admiration of the entire district. Anxious to keep up the good character he had so worthily earned, he overdid the feeding, and spent large sums on purchased food, principally oilcake and bean-meal. To such an extent was this carried that, even under the best management, and an excellent market for its produce, the dairy never paid itself, and had to be given up after a three years' trial, the owner, although in easy circumstances, not being able to stand a yearly loss, or, what was equivalent, to keep a stock whose expenses were equal to the amount realized from their produce. A small flock of ewes now occupy the pastures previously devoted to the cows, equally select in their own way as the cows were; but, profiting by experience, they are allowed to

find their food exclusively on the farm, and, with the present prices for wool, lamb, and mutton, yield a handsome return for their keep.

Rapecake is about as economical a purchased food as can be used on a farm; and yet it is very questionable, when used for anything else but fattening stock, whether it ultimately pays.

There are, undoubtedly, occasions when it becomes almost a necessity to use a little cake, and when, in its own way, it is highly useful. Dairy cows eat it with avidity; and it is an excellent thing for a short period after calving, or at a time when, being fed on mangolds or other watery food, the milk may be a little thin. Both rape and linseed cake enrich such milk wonderfully; but it is difficult to suppose that the extra produce would pay for its continuance throughout the year, unless under extremely favourable circumstances.

Both experiment and analysis agree in giving to rapecake as much value, as a food, or nearly so, as linseed cake, although so much cheaper; and for cattle it is (of late years) pretty much used. Suppose, then, that 6lbs. of rapecake are given daily to a milch cow (less cannot reasonably be given), an expenditure of 4½d. per day is involved. Scarcely, indeed, can rapecake fit for cattle-feeding ever be bought for £7 a ton: 4½d. a-day for the greater part of the milking season—say, 250 days—amounts to 5 guineas—a very large sum to have to deduct from the cows' produce, and hand over to the cake dealer.

Even sheep—the kind of stock that of all others have been paying best in this country for some years past, and that are called by the Swedes "the animals with golden feet, on account of the tendency they have to enrich not only their owners but the land on which they feed—will not, by any means, pay for an unlimited supply of concentrated food.

A pound of crushed oats given to each ewe daily when nursing, is an excellent addition to their other food; and they will, in a wonderfully short space of time, show its good effect by improved condition of both ewe and lamb.

A like quantity of corn or cake given to fattening sheep is also a vast improvement, enriching the manure and consequently the land on which they are fed, besides hastening the fattening process considerably. So universally is this known and acted upon that sheep are seldom attempted to be fattened without receiving a moderate quantity of crushed corn or cake. When, however, large quantities are given, the benefit derived therefrom is in a great measure lost—the improvement effected on the animals being utterly unable to meet the extra expense incurred, and at the same time leave a moderate margin for the hay and turnips consumed, and also to pay for attendance, nets, and other charges unavoidable when sheep are confined on turnips.

The present season is somewhat of an anomalous one, as the amount of available food at the command of the stock-owner varies very considerably in the three kingdoms.

In England there are districts where food in the shape of hay, straw, turnips, and mangolds is abundant, and where the difficulty is not to procure food for the cattle, but cattle to consume the food. This unusual difficulty is of course caused

by the critical state of the cattle trade, occasioned by the presence of the plague or rinderpest, as it is variously designated.

In some of the English counties turnips are nearly as bad a crop as they were in 1804, this result having been occasioned by the dry weather of June; in others by the ravages of swarms of flies, which ate up every green leaf the moment almost it made its appearance; sometimes even destroying the crop after it had been considerably advanced, and when to all appearance it was beyond the power of such puny-looking enemies to destroy or even injure it. In such districts the available food must of course be used with discretion and economy to bring the stock on the farms on in health to next year's grass, as there is no prospect for some time to come of being able to profitably lighten the stock of cattle, particularly with the view of lessening consumption. In ordinary years this could always be done, and a farmer could without either trouble or difficulty lessen or increase his stock according to the quantity of food he had on hand. At present, in England or Scotland, any one attempting to remove store cattle for the purpose of sale from his farm, or purchasing such even in the districts where fairs and markets are still permitted to be held, would be looked upon by his neighbours as one who had lost all interest in his own affairs.

In Scotland green crops are not quite of such a varied character as they are in England; but still there are districts where turnips are very indifferent, the damage in the early part of the season having been caused by dry-rot, tail-worm, and finger-and-toe. In by far the larger portion of the country, however, turnips are a good crop; in some particular portions they are even extraordinary good. Fodder is also abundant—too much so almost for those who have it to sell, and who grew crops of hay, &c., for the express purpose of supplying the owners of town dairies with winter fodder for their cattle.

The extreme virulence of the cattle plague, in clearing out nearly every animal where it has shown itself, particularly in the town dairies, has cut off a great source of demand; and farmers, who calculated on large and remunerative prices for hay, straw, turnips, and middling-sized and small potatoes (the latter largely used by the town cow-feeders), can neither find a profitable market for their produce, nor yet dare they venture to buy cattle to consume it.

Glasgow, the great centre for the farmers of the West of Scotland disposing of their produce, has suffered severely, and the price of fodder is in consequence extremely low. During the past three months it has become an admitted fact, by every one directly or indirectly connected with the cattle trade, that no animal could be considered free from infection that had passed through Glasgow, and the immense mortality that has occurred in that city would almost make it appear that such theory was established on a sound basis. It is currently supposed that up to the present the Glasgow cow-feeder, of world-wide fame, has lost 800 of his cows. Such a loss, although an excessive one, and in these kingdoms probably unprecedented, occurring to a wealthy man, is only a loss of so much capital, while many a struggling and hard-working man, who kept himself and his family respectably, and paid at all times 20s. in the pound, has been irretrievably ruined by the loss from his stock of from twenty-five to forty or fifty cows.

Although not exactly connected with the subject, it may be noticed that, even in a locality that has suffered so much, and where it was highly dangerous to have anything whatsoever to do with travelled cattle, there has not been wanting various parties disposed to speculate on the purchase of extensive lots, principally West Highland and North Country. Irish, although coming from a country that has as yet not shown the slightest manifestation of disease, being especially eschewed. Whether it is that the latter, from being knocked about when on board ship, or from lying in the lairs about Glasgow, perhaps previously occupied by infected animals, are really more susceptible of disease, it is hard to say; but certain it is, Irish store cattle are at present almost unsaleable in the West of Scotland.

Several lots of three-year-old Highland Scots and Queys, and also of six-quarters old of the same breed, were purchased at the Falkirk October tryst, for the express and avowed purpose of speculation, grass being taken in the neighbourhood at high rates to place them on. Should these lots, in sporting phraseology, "run lucky," they will pay splendidly, the heavier beasts being bought at an easy two-thirds of their ordinary

value, and the younger animals at very little over half, their previous owners being delighted to get them off their hands, even at such a sacrifice.

In Ireland, during the present season the food prospect is anything but a cheering one, the turnip crop being, unless on very occasional fields, absolutely nowhere. The cause of the failure of this valuable crop, in a country the climate of which is so well suited to its growth as Ireland, was the extreme dry and arid character of the month of June. May was a delightful month, and the land was got well-worked and the seed sown when the soil was in splendid condition for its reception; but the dry weather set in before the young plants had got hold of the dung, and between the attacks of the turnip beetle and the scorching rays of the sun they were literally exterminated. They were in the majority of cases re-sown; in some instances again and again; and, although eventually stimulated by the excessive rail-fall, they did not start into luxuriant growth: it was too late to form bulbs of much consequence, and by the beginning of October the leaves were decidedly the leading feature of the turnip fields. Hay is plentiful and cheap, however, although not always of the best quality, on account of the difficulty experienced in saving it during the exceedingly wet months of July and August.

The difference of the weather between Ireland and Scotland and some of the northern counties of England during the past summer has been very marked. While in Scotland they had nice showers in June—just sufficient to start the turnip, and force them beyond the reach of the fly, in Ireland they had not a single shower; and, again, while in the latter country farmers were at their wits' end to get their hay saved, and could not do so for drenching rain, in Scotland they were rejoicing at the excellent season they had for their hay, many of them getting it cut and saved without a shower.

Cattle in Ireland are at present abundant; and, thanks to God's blessing on the precautions that have been taken to exclude it, as yet no sign of the cattle plague through its length and breadth. Should this dreadful disease abate in England and Scotland without visiting Ireland, the Irish farmer has the prospect of finding an excellent market for his surplus stock in the two sister countries, providing he can bring them round until the period of stocking the pastures arrive, in good saleable condition. This he will in all probability have more trouble in doing than either the English or Scotch farmer, for reasons already shown; but yet he has the advantage of a fine soil and genial climate, which does wonders for him, enabling him to try many expedients almost unknown to the others. His great advantage, however, over them is his being able, through the mildness of the climate, to shorten the winter by cutting off a bit at both ends.

The last half of January, February, March, and first fortnight of April constitutes the trying period of the Irish store farmer. As will be hereafter shown, when coming more particularly to speak of the winter feeding of stock, the Irish stockholder has the immense advantage of being able to feed his cattle night and day in the fields, for at least a couple of months after they have been housed across the Channel, and that without the slightest injury or danger to their health, but, if the grass has been left anything rough, to their manifest improvement.

Ireland is not called the Emerald or Green Isle without excellent reason. Her proximity to the Atlantic exercises a powerful influence on her climate, which seldom rises or falls to the extreme either of heat or cold. No doubt the rainfall is in the extreme, in the south or west, but this is beneficial to the farmer, as it nourishes and promotes the growth of grass through pretty nearly the entire winter. While in Scotland frost so hard as to stop the plough has on several mornings been already experienced, there has been in Ireland little more than frosty dews, and in all likelihood the plough may not be stopped half-a-dozen mornings by frost during the winter, while in the more northern country it may be stopped as many weeks. Such a marked difference in the climate of two adjoining countries must to a considerable extent render necessary different details of management, which difference will be noticed and compared, as we go on to particularise the different modes of winter management carried out in various localities in the three kingdoms.

It will be nearly always found on intimate acquaintance with the habits and customs of a locality, that where there is any

marked deviation from the established rule and custom of other districts, there is generally a sound reason for such difference, whether the difference consists in the management of live-stock, or the rotation followed out in the cultivation of the land. It does well, therefore, for any man, whatever his experience or skill, when changing his farm, whether it be to a neighbouring country, or even country or district of a county, to study well the modes of management of men already localized, before introducing what are sometimes in the commencement called "sweeping reforms;" but which in the end often prove disastrous to the party introducing them.

To carry the point still further, and to bring it down still more closely to daily life, the large and wealthy farmer will, if observant, and not above taking a hint from a person beneath him in position, often see many things in the practice and economical management of his humbler neighbours well worth imitation. Necessity being the mother of invention, the man of limited means is compelled to try every conceivable plan that will, in the working of his land, save labour, and consequently expense; and in the management of his stock every plan must be tried that will save food; and yet not stint the animals, and throw them back in their growth and produce.

The farmer in easy circumstances not being goaded by the spur of necessity, does not so readily hit upon improved systems, nor is he generally so fertile in expedient; but he is not his own friend, when he is above adopting the systems of more humble men, when they are founded on reason and common sense.

It is a question often asked why Englishmen, taking land in Ireland, fail so frequently in establishing themselves? and the blame is often attributed to the grasping character of the Irish landlord and his agent. It will, however, be most frequently found that laying out their available capital too suddenly on improvements that the state of the land and the amount of their capital does not warrant, has more to do with this *marked peculiarity* than any untoward influence exercised by either the landlord or his agent. Landlords in Ireland are like landlords elsewhere; they like a tenant who pays with punctuality (and where is the landlord or agent to be found who does not)? the rent paid, every assistance is given that a reasonable tenant could desire.

A cautious steady man, whether English or Scotch, settling in Ireland, who is not above imitating his neighbour, and who runs into no heavy expenditure in the feeding of his stock until he has felt his way, scarcely ever fails to succeed.

This *en passant*. We now proceed briefly to review the most economical modes of winter feeding pursued by successful farmers throughout the kingdom; this, as stated at the outset, being the principal object of the present paper.

In wintering every description of stock, farmers living in a district where coals are plentiful, and consequently cheap, possess a most decided advantage. Not only is a palful of warm food a grateful and nourishing meal to the animal itself; but it is on the score of economy a decidedly excellent thing for the pocket of the farmer. Cheap fuel enables him to utilize every portion of his chaff and light grain, which otherwise would, in all probability, be thrown out on the dung-heap. In the neighbourhood of large collieries, the screenings can be bought as low as a penny per cwt., which screenings are, for the farmer's purpose, quite as good as the round coal, if not perhaps better.

A mixture of boiled turnips, bean, or other chaff, and light corn, with the addition of a small quantity of bean-meal, given lukewarm, and in a semi-liquid state, forms probably the best and most economical food that could be given to a newly-calved cow. The produce from such food is large, and of excellent quality; and in the middle of winter, when butter produced from the milk of cows fed on raw turnips is execrable, the butter made from such food as this is of the very best quality.

This forms the favourite food of the Scotch cow-keeper, whether in town or country; and as early as the beginning of October, the milking stock are housed at night, and receive a portion of boiled food morning and evening.

Potatoes given raw, after being passed through the turnip-machine, are also very largely used, and are very productive of rich milk. In such a season as the present, when potatoes in that country are a splendid crop, and the price extremely low, the small, middling and slightly diseased portion of the crop

enters largely into consumption, and form an excellent and cheap food for dairy stock.

Where the dairy is a large one, the stock of chaff is generally exhausted at a very early period of the season. When this is the case, chopped hay or straw, but principally the former, is used in the boiler along with the turnips, and forms an excellent substitute.

Young cattle are mostly wintered in yards, on straw, and a few turnips when they can be spared. For this purpose there is invariably a yard, surrounded with a shed attached to the farm steading. The Scotch house their cattle in winter probably to a much greater extent than is done in either England or Ireland.

In the latter country, particularly, a very great contrast is presented when compared with the practice of the Scotch. Large herds of cattle in the very best districts are wintered in the fields, and never enter a house, yard, or shed during the winter. Their owners—many of them wealthy, and most of them in comfortable circumstances, never think of providing house-room for them, declaring that there is not the slightest necessity for it, as the animals enjoy better health, and in the case of milk cows have a healthier and better calf, and the premature births much fewer than is generally the case when the animals are confined to warm houses during the period of gestation.

Where the number is large, the pastures will not, of course, support them in good condition without the aid of other food. The most convenient, and of course the only available food in districts mostly in grass, is hay, which is just given on the pastures. Once or twice a day, according to circumstances, the load of hay is brought into the field amongst the cattle, and the man proceeds to throw it off while the horse moves on slowly.

To men unaccustomed to such a style of feeding, this mode appears most slovenly and wasteful. In practice, however, it is not really so, as the animals lick up every morsel of the hay, and in a short time the field becomes literally covered with manure, or *moched*, as they say in Co. Limerick. With such a top-dressing, the fields in which this process has been carried on give a most extraordinary crop of hay in the ensuing season. An eccentric but intelligent farmer of the old school, who flourished and made a large fortune in the first Bonaparte's time, used to feed hay to his cattle in no other way than this; and when his men complained in stormy weather that the hay was blowing about the fields, invariably gave them for answer, "As long as it is not blowing out of my fields, go on with your business—the cattle can follow it."

Although not now considered in most districts in these kingdoms good management to keep cattle in the field day and night during the whole year, yet it is perfectly astonishing how well they thrive when they have enough to eat, and how healthy they are when so kept. Pure Shorthorns, that by many persons are considered so delicate that they would wither and die if exposed to the inclemency of even an Irish winter, are often turned out to seek their food as they best may, without getting the slightest assistance in the shape of hay or turnips, and for the very purpose of bringing them into a healthy breeding state. Prize animals that have been all their lives pampered and fattened up to such a state of obesity as that they refused to breed, are often brought round to become useful breeding animals by this course of treatment, when every other plan had failed.

On a recent visit to the neighbourhood of the Blackwater, paid to a friend farming about 350 acres, we remarked the excessively small quantity of turnips grown on such an extensive farm, the dairy stock alone amounting to close on 80 cows. "Do you see," said our friend, "these fields covered with grass almost fit to mow, and these ricks of hay cropping out in our view on different points of the farm? These are my principal dependence for the coming winter for my 80 dairy cows, and a corresponding number of young stock. I have a few acres of turnips and mangolds to give any of the cows that may happen to calve early; but were I to grow these crops extensively, ruin would stare me in the face. My dairy is a summer one, the cows three-quarter bred Shorthorns; and although in the fields night and day during the entire winter, they will come to the calving in blooming condition, and probably I will not lose a single calf by abortion."

This is the experience of an Irish rent-paying farmer, as detailed to the writer, on his own fields, delivered in the

broad, and the best of the district, by a fine, comfortable, almost noble-looking man, born on the land, which he held from an Irish landlord (whom, by the bye, he described as one whom to know was to love), and under whom his father and grandfather held the land before him.

This mode of treatment is eminently suitable for young cattle, as they thrive, grow, and even fatten on the pastures, when supplied with hay and a few turnips, thrown on the grass, when often animals of the same age fed inside, and supplied with a liberal amount of good food, will keep obstinately thin.

At the spring fairs, when cattle are being bought up for stocking the pastures, it is a noticeable and well-known fact that the animals which have been out-fed during winter are the most eagerly sought for and first bought up; and those beasts that shew by their sleek and shining sides, destitute of every particle of old hair, that they have been housed and well cared for during the winter, are frequently not bought at all, or are expected to be got at an easier figure, if they happen to be shown for sale at an early period of the season.

Sheep also thrive remarkably well on the pastures during winter, when they have not been eaten too bare during the summer. Where breeding ewes are kept to a moderate extent, it is an excellent plan to leave a portion of the pastures rough, and preserve it especially for the ewes when nursing.

A ewe will give more milk by far, and rear a better lamb in consequence, when she has a fair bite of grass, along with a few turnips, mangolds, oats, or other food, than she would do had she almost an unlimited supply of the roots and corn without the grass. The bite of grass seems to assist the secretion of the milk, while the other foods would appear more to strengthen her own body and lay on fat. Every one knows, who has anything to do with a flock of breeding ewes, that the worst lambs are invariably with the fattest mothers, while a wretched-looking mother will often have the best lamb in the whole flock.

Score sheep, if many of them are on a pasture, are all the better for having a few turnips scattered amongst them daily during the winter; and a few racks, kept constantly supplied with hay, will tell well in improved condition, and greater size than they could ever have attained to had they been depending solely on the grass for a subsistence.

The greatest mistake that could possibly be committed with regard to sheep has been fashionable of late years, and being still encouraged at the shows, is likely to be perpetuated for some time to come. The mistake alluded to is the pampering of the rams. Such animals, when bought by ordinary farmers at high prices, for the improvement of, it may be, a small flock of sheep, lead in many instances to nothing but disappointment. When put to the ewes, he is not able to follow them about, and, in attempting to do so is almost sure to get knocked up in his feet, and probably useless for the season. Where he does succeed in tugging the ewes, many miss, and those which breed have often puny lambs. The ram himself, not generally getting the same treatment in his new quarters, often pines and dies during the first winter.

A grass-fed ram, equally well-bred, although not selling at half the price, is usually, from his performance, just worth double, as he is active and lively, and can follow the ewes about without the slightest trouble.

It is high time, in this age of enlightenment, that all this gorging and trimming of animals, for the sake of making them seem what they really are not, was done away with, and the animals shown only in comfortable, healthy condition. Humanity, if not self-interest, would almost dictate such a course.

It is at this period, when the country is in such a state of alarm about the cattle plague, are attracting a more than usual share of attention. It is questionable whether swine pay for crops grown expressly for their use; but whether the fattening of them leaves a fair return or otherwise, pigs can always be made to pay well in the yard of the industrious farmer. There is probably no domestic animal so easily kept as a sow. A half-rotten turnip or mangold, a few grains of corn gleaned at the barn door will do for her for the day; and if, in addition to what she can forage for herself, she gets a drink of whey or butter-milk once a day, she will keep herself in excellent condition.

In many parts of the country, young pigs are now bringing 15s. each at a month old, and bargained for before they see the light. With such prices, there is ample encouragement for every farmer to keep a few well-bred sows, as the revenue derivable from them is singularly sure and regular, and the sows themselves (except during the month they are nursing) feeding almost only on what without their presence would be absolutely lost. Fattening bacon hogs is quite a different trade from this, requiring more skill and capital; and the price of fat pork and bacon being so fluctuating, the profits are much more uncertain.

There is still another description of farm stock to be noticed, and that a most important and often expensive one—the working horses. Good treatment and a liberal allowance of food is well repaid on the horse—by increasing his strength and activity, and thereby his usefulness. There is no more distressing sight, nor one more indicative of bad management or straitened circumstances, than miserable farm horses, requiring to be urged at every step by whip or rein. It is much better to have one pair of well-fed, smart stepping horses, able and willing to do their work, than two pair badly fed and badly cared.

At the same time, it must be observed that there is scarcely another variety of farm stock requiring such economical management as the horse. If fed too liberally for the amount of work he has to perform, there is a loss to his owner—a loss, too, that cannot be regained, as it is by his work alone that he can re-imburse himself for his feeding. Hay and oats are the articles of food of all others most suitable for the horse; but the farmer must look about for some less expensive articles of diet to feed his horses on, or at least to substitute for a portion of them.

In Scotland and England, where the horse is better cared for than perhaps in any other country in the world, he is taken off the grass about the end of September or beginning of October, and housed, boiled food, consisting of turnips, chaff, and a few beans, being given to him morning and evening. On this food, he keeps in first-class condition and is remarkably healthy, unless he is given the boiled food in excessive quantity, when he is subject to gripes, which often proves fatal. A little corn is given twice a-day, and the racks are filled during the winter with bean or oat straw; hay, however, taking their place as the days lengthen, and the work gets continued and heavy.

In Ireland the farm-horse has to suffer infinitely more hardships, being hard-worked, and often badly housed and fed. They are much longer in being taken from the grass than in the two sister countries, it being often the middle of November before they are stable-d. Hay, oats, carrots, potatoes and bran, and sometimes boiled barley, constitute the principal articles of diet when inside, during the winter months. Boiling food for them on the extensive scale that is practised in Scotland is never attempted, on account of the dearthness of fuel.

There is, however, a food peculiar to itself coming greatly into repute of late years for horse feeding, and that is furze, variously called gorse or whins. Its good feeding qualities have been made known, principally through the exertions of the Rev. Mr. Townsend, Rector of Aghada, who has been using it for both horses and cattle for many years. It forms a very nutritious and palatable diet, and there is no other crop at present known to the agriculturist that will feed as many head of cattle to the acre as furze. Without going quite the length Mr. Townsend recommends, no farmer would do wrong in sowing an acre or two near his homestead for his horses: they eat it greedily, and with apparent relish; and it materially lessens the consumption of hay during the winter months.

It is sometimes recommended to sow it on poor land, but it is idle to do so, as one acre of good land in prime manurial condition will grow as much as five or six acres of poor land will do. It is not objectionable near the steading or farmhouse, as the rich dark green of the young shoots is rather ornamental than otherwise, and its being grown near the stables is a great convenience, on account of a daily supply being required.

HARVESTING CORN AND DISPOSAL OF THE CROP.

At the last monthly meeting of the Winfrith Farmers' Club, Mr. CHAPMAN SAUNDERS said: In introducing this subject—one which I think you will agree with me is of a very practical nature—I am reminded of the impossibility of laying before you one system, or propounding a theory, suitable for each different district, with its variation of climate, soil, and many other circumstances peculiar to locality: difficulties only to be overcome by individual energy, skill, and foresight of the practical agriculturist, assisted by a knowledge of the peculiarities of the locality in which his lot is cast. It is, therefore, my intention to make these remarks of as general a character as possible. Harvesting, or the method of securing the crop, is governed by many circumstances, amongst which may be enumerated the situation of the land, its relative position to that of the farm-buildings, the supply of labour (horse-power and manual), and the difference of seasons. In securing wheat, the most important of our cereals, the methods of cutting which I shall notice, and which are now almost the only ones at least in practice in our own county, are mowing, reaping, and cutting by machine. Mowing, or cutting with the scythe, may be performed in two ways; the more common method, but at the same time I may add the most untidy of any, is that of laying the corn out in swathe at once ready for the binder. This, although the least expensive method of cutting by hand, is attended by certain disadvantages, some of which I may notice. First, the untidiness of the sheaves, when bound up, owing to the corn in the swathe being laid in a slanting direction instead of at right angles; consequently the butt ends of the sheaves are uneven when they leave the hands of the binder, and thus, when set up in the field, have not a firm footing. By this method also there are often ears of corn in the tails of the sheaves, which remaining in the field some length of time, and the weather perhaps unfavourable, may become sprouted, or at least be carried to the stack in an unhealthy condition; besides this there is always a larger quantity of "rakings" left over the field than by other means, and this being allowed to remain exposed to the weather until the sheaves are carted, and sometimes the greater portion of other crops, is of less value than that which has been secured earlier. Raked corn is not only of inferior quality, but very frequently has particles of soil mixed up with it, collected with the straw, thus rendering it fit only for seed purposes, or to grind as food for cattle, pigs, &c. On the other hand, mowing may be resorted to where corn ripens all at the same time, when there is a scarcity of labour, and where the reaping-machine is unavailable, as the only means by which to make progress in a short and seasonable period. I consider sheaves of mown corn become fit for carting earlier than those which have been cut with the hook; on account of their being looser they admit more air through them in the field, and likewise in the stack, as the corn when placed there might not have been in first-rate condition. The other method of cutting with the scythe is that of throwing the corn when cut against the standing corn. In this case the mower must of necessity be followed immediately by a gatherer, to remove the corn and place it in sheafs. On the manner in which this operation of gathering away is performed depends much the quality of the work, as the loose ears which remain often become entangled round the scythe which follows, and may be the cause of some delay, in addition to the inferior work done. Having carried this system into practice several seasons when the corn has not been adapted for cutting by machine, I can strongly recommend it. The work being well performed is nearly if not quite equal to that of the hook; it is also more expeditious and less costly, besides it is a method by which an ordinarily mixed staff of labourers on the farms, many of whom might make inferior and bad work if placed to reap, can each find his proper place. An able man requires one about equal in strength to follow him, whilst an older man will only require a strong lad, and so in proportion—a woman or lad as available being engaged to tie after each scythe. I generally place them according to families as much as possible, for the better division of their earnings—two scythes, two gatherers, two tyers, and if there is a small boy

in the family he throws the sheaves together. This forms a company, who work at piece-work, the price paid being 6s. per acre, besides ale or cider, with the usual extras as when by day-work. Where corn is laid badly I prefer this method even to using the hook. Reaping, or what is more commonly termed "yawing," is, when taken altogether, about the cleanest mode, but it costs at any rate 2s. or 2s. 6d. per acre more than the one last named. But on level land, and good standing corn, with a fair crop, no kind of work can surpass that of the reaping machine, that is when circumstances favour—viz., moderately level land, fair size ridges, free from large stones, standing corn, where cutting can be followed on every side of the field, and I have frequently found less rakings after it per acre than from any other method. Another reason why the reaping machine is to be recommended is that at the commencement of the harvest season horse-power may be employed in cutting, when otherwise it would be of no value just at that immediate time, all manual labour being directed to tying, &c., after. A close stubble is desirable under general circumstances, for the value of the straw gained and the better carrying out of autumn cultivation. An exception may be made where the land is sown down with seed, and intended as an outlet for sheep during the autumn; and, besides having your stock deprived of a certain amount of food cut off with the straw, there arises the necessity of allowing the crop to remain on the field several days longer, at all risks, before it becomes fit for carting. I consider it advisable to tie oats as well as wheat, if possible, as the expenses afterwards are reduced by so doing. Barley is seldom tied into sheaf in our county, and perhaps for sufficient reason; but in the midland and northern counties loose barley forms the exception rather than the rule, nearly all being tied. In Scotland I found not only the bulk of the wheat, barley, and oats tied, but the rakings also. There it becomes, perhaps, more a matter of necessity, as harvest work does not commence until some few weeks later than with us, and consequently there is more dew and a different atmosphere altogether. The barley is tied with a double bond, stitched and secured from the weather by two sheaves meeting each other over the centre of the stitch, the ears downwards over each end of it, which must serve as a good protection in a late season. In a general way sheaves of all kinds should be small, and the stitch or shock, consisting of from five to eight on each side, should be made by commencing in what is to form the middle, as by this course the sheaves lean towards the centre and stand better afterwards; each sheaf should be placed or rather struck on the ground in a slanting position (not upright and made leaning afterwards), and should meet directly the sheaf on the opposite side, so that each one may help to support the other. A very secure method for sheaved wheat, though not often practised or necessary, is that of cap-stitching, performed by first placing a sheaf on the ground perpendicularly, then placing others in a leaning position against it to the number say of fifteen or twenty, the object being to produce a round stitch, firm and regularly pointed at the top to receive the cap-sheaf or hood, which is made of two sheaves bound together, or, what is better, a sheaf double the ordinary size bound near the tail tightly. This sheaf is spread from the centre and lifted over the stitch, the ears drawn downward, and the reed straightened; another band round the whole completes the stitch, which is thus secure against all weather, and is a very good practice in small enclosures and in wet seasons, when from heat and moisture corn vegetates quickly, also as a means of securing those kinds of grain with a delicate skin and which consequently sprout freely. In changeable and stormy weather all sheaves should be tied as soon as the corn is cut, whether it be by hand or delivered from the machine, and it should remain standing until it is fit to cut and tie, as thus during unsettled weather it is ready to bind sooner than when flat on the ground. When corn has become what is termed "dead ripe," it is as well (provided there is no grass mixed with the straw) to cut, tie, and stack, in the same day. There are reasons favourable to this practice, which are—first, economy, as the expense of putting the corn into shock is

saved, and also corn which has "overstood" has its ears so crooked down that it is impossible to make a shock secure from wind and weather. In the usual way, that is when a few days are allowed between cutting and carting, I consider mown corn tied into sheaf may sometimes be fit to stack before that which has been reaped; owing to its being looser and more open in the straw more air is admitted through it in the field and also in the stack, an advantage when it has been put together not in a very first-rate condition. On the other hand, sheaves that have been reaped settle down closer together when carted, producing a much firmer stack, and better adapted for the purpose of being shorn after the harvest work has been completed; also its appearance is somewhat neater. A well-made and firm rick is desirable where rats exist in any quantity, as I have found it to be a sufficient guard against any number of them when properly constructed and shorn before any of these vermin have made their holes into or under it. Whether the rick is constructed on a saddle or on the ground is of little consequence when treated in a proper manner, as far as rats and mice are concerned. The trimming should be performed somewhat after this manner. From the eave (which every stack of sheaved corn should have, to carry the rain falling on the roof away from the sides) downwards, to within about four or five feet from the ground, the uneven ends of the sheaves on the outside may be cut off sufficient to give a neat appearance, with a long blade fixed in a long handle for the special purpose, or a scythe partly worn with the point taken off will answer nearly as well. The remaining, or bottom part, has to be shorn with an ordinary cutting-knife, taking away sufficient, it may be nearly to the bond of the bottom sheaves, also the bedding beneath, consistent with giving this under part that closeness of the reed and hardness which, being thus obtained, no rat can penetrate, and, from the small base on which the stack is thus made to rest, the angle on the outside is such that if a rat jumps against the side it is unable to hold its position, but falls to the ground from whence it sprang. The method is very effectual and also practicable, as I have found stacks so treated within a short distance of immense numbers of these vermin to withstand their attempts successfully a year or even two. This leads me to consider the best position for the stack, whether placed in the field or at the homestead, and this must depend on the value placed upon the straw, distance from the steading, state of the farm roads, horse power, &c. At the time of harvest, when the stacks are being made, the selection of a proper spot for each leads to the inquiry when and in what manner are they to be thrashed out, and the use to which the straw will most probably be applied? I say probably, because it sometimes happens that the straw, in its nature best suited for feeding, has been exposed to the weather, so that it may ultimately cause some deviation in the course pursued from that first intended; therefore I would say, first secure for your cattle the straw intended for them, unless it is impracticable to do so from more weighty considerations, it may be, as regards the grain within. The stack, if intended for removal to a barn, should be placed as near as possible to it at harvest-time, for obvious reasons; it is better to do so at that season than in winter, or when its removal becomes necessary, at which latter period more horses are frequently required to cart home than would be the case at harvest. There is yet another and equally important point to be considered. When the day for removal (say in winter) has arrived, one should be chosen with a clear atmosphere, free from vapour, following others of a like favourable nature; but sometimes necessity from existing circumstances will not permit the awaiting of such season; then is the advantage of having a stack situated conveniently near the barn highly to be valued. Again, a clear winter's morning is not always followed by a fine day, and the work of removal having commenced—a storm overtaking loads by the way—the greater the distance the loads have to travel the more injury to them results in consequence. Even in such case, if no rain actually falls, a lengthened exposure to the atmosphere tends to give the grain a damp condition. I do not object to making stacks in the field when it is to be thrashed by steam; but the spot selected should be adjacent to a good road, so as to enable the corn and straw to be drawn separately to the homestead if required. Thrashing, whether conducted in the field or in the barn, has each its own proper season, and should be carried on with greater regard to atmos-

pheric influences than is frequently observed. It may be prosecuted away from the barn in the open air during the summer months when fine weather prevails, and thus the corn may derive much benefit from the sun's rays or a drying wind; but I consider that during the two last and two first months in the year, viz., November, December, January, and February, it is preferable in most cases to transfer the greater portion to the barn; an exception may occasionally be made, such as during frosty weather. It is in some measure due to the carrying on of out-door thrashing by steam power at all seasons of the year, as pursued by many, that complaints from factors and millers are sometimes made of the condition of the grain offered in the market during the winter season; when it is sometimes scarcely fit to be ground up at once, still less suited for storing away any length of time, or for shipment. This fact should not be forgotten by those who assert from the want of being more practically informed, that barns are unnecessary to a farm under present circumstances. The benefit derived from having, not one barn only, but several on most farms, is decidedly worth consideration. It is preferable to have two barns of moderate size rather than one large one, for the purpose as much as possible of keeping the different kinds of grain separate, as well as the better disposal of the straw. Where the farm is large and hilly, as many are in this neighbourhood, a barn with a shedding attached is very advantageous for the purpose of consuming a certain quantity of straw by cattle near where it is grown, in which case the manure is more easily returned, thereby reducing the expenses of the farm. Another barn may be allotted to wheat, either filled with sheaves at harvest time, but I consider better suited for the purpose of putting the rakings into as they are collected at different times. The system of mixing loose rakings with sheaves, as occasionally practised, is a very untidy one, in favour of which few arguments can be advanced. Thrashing in the barn by horse-power during the winter, although considered by some a slow and tedious process as steam become general, has certain advantages, one of which is economy; by that I refer to the disposal of the straw, and to the cost of labour. On some farms, where the number of labourers employed is limited, there is a difficulty and likewise an inconvenience experienced in collecting a sufficient number of people to keep a steam thrashing machine employed, independent of carters and ploughmen, when the teams or some portion have to remain idle. This does not apply in the same degree to horse-power machines, which require a less number, and the individual strength required is not so great. I would further add, for reasons before stated, I consider it more preferable on small farms to keep a horse-power machine than to hire one of steam. Whether on large or small farms, there are certain times in the winter when both people and horses are unable to do much on the land, or perhaps there is not much at such times which can be found for them to do; these may be employed at the shortest notice, where there is a horse-power machine kept ready fixed at a certain barn, which might be allotted for the particular use where there is a sufficient number. I do not advocate thrashing by this means at all seasons, as during warm weather and in summer, when considerable fatigue is felt by the horses, steam is preferable. Water-power is preferable to any other where it can be obtained with certainty at any season, and in all other respects convenient. Having thus briefly noticed the harvesting and thrashing of the crop, I shall proceed with a few remarks especially on its disposal. In these days, when so large a portion of the grain is thrashed by steam, it is the custom of some who either place but little value on the straw, or from a limited means for consuming it either as fodder or as litter for cattle, to thrash a large portion in the field where grown, distributing the straw carelessly over the land as muck, not knowing how to dispose of it better, or perhaps allowing it almost to waste away in heaps. It would I think be much better, especially on land at a high elevation or of a cold and tenacious nature, to form a sort of wall, say six feet thick and ten feet high, enclosing a sort of yard, and in this way to receive the refuse straw thrown over it, which would be very serviceable in severe weather for sheep to lie upon. This system is, however, one of great waste, and which is to be recommended only in few instances. Straw may be better disposed of, where the distance from the homestead is great, by placing the stack at harvest-time near a good piece of roots, and making a temporary yard with

sheltered hurdles, with a few poles and small posts, to construct a light roof; such place thus put up where two or three fields meet might answer the purpose for two or three successive years with slight repair. The stock would derive much benefit from being driven thither for the night, and the land being of an average kind, with oats or barley to follow, would not be much the worse from a portion of manure being thus taken away. Such a course is certainly preferable to carting the straw and roots home and bringing back the manure. In the immediate vicinity of large towns straw may sometimes be disposed of at remunerative prices, in which case it may be advisable to sell and buy in exchange manures of a more concentrated kind. In some seasons no surplus straw exists, as the amount of litter which may be converted varies so much with the weather, to keep animals of whatever kind in a comfortable and thriving condition. Straw as fodder is of more or less value according to the stage of growth at which gathered, that comparatively early cut being much more nutritious than that which has overstood; the quantity of grassy food mixed up with it, and also the state of the weather when carted, should be considered; hence it is advisable where straw is of value to select the best for feeding as far as practicable. Oat straw I consider preferable to wheat or barley, and where little or no pasture and meadow land exists more straw may often be advantageously and profitably consumed in proportion, either in the shape of long straw or as chaff. As far as my own experience has gone, I am of opinion that straw cut into chaff and given in large quantities to sheep does not answer so well as for bullocks; but I have frequently found sheep thrive where they have been able to select what they choose from loose straw thrown out, treading down the remainder. The fresh thrashed is preferable to stale, which being sometimes exposed to atmospheric influence, is not so well relished by animals consuming it; hence the advantage of the flail, by which the corn is thrashed out, and the straw served from day to day to cattle in yards, as also to cart-horses, over that of machine-thrashed, and stacked sometimes weeks and even months before consumed. I prefer giving good straw to cart-horses in their racks rather than hay, which is often found to be very wasteful. Hay if given to cart-horses at all should be as chaff. If the money value of the hay which many horses consume and waste were expended on them in the shape of extra corn with the corn before given, and substituting straw for hay, I have little doubt but the result would prove more economical and better for the animals. Respecting the disposal of the corn, it is not my intention to detain you with any very lengthened remarks. The wheat goes for the most part to feed the people—would, I could add, at present prices, remunerative to the grower; but to this he has quietly to submit by what is a so-called free-trade principle. Barley of the best description, and of which only a limited quantity is grown in this district at least, goes to be converted into malt for brewing, the inferior qualities, together with oats, peas, beans, &c., being made use of for stock-feeding purposes. The inferior barley—by far the larger proportion grown—is thus used as the raw article, prevented as we are by that odious impost, the Malt-tax, from making the best use of what might be a very valuable article in the production of beef and mutton, commanding at present, and in all probability for a long period, very high prices. This is another reason, with others already set forth, why it ought to become a consideration with the greater portion of the community at large to demand the withdrawal altogether of such impost. The great injustice of this tax to the farmer must also be apparent when it is remembered that barley is almost the only raw material of home production subjected to taxation, and so heavy, amounting to 70 per cent. upon the average price of barley; and with free-trade in wheat why should he not have the privilege of free and fair trade in barley? I think it is pretty well proved that there is no class of persons in this country who would bear the remaining of a similar tax as farmers. See what the hop growers and the paper manufacturers and others have done. I would impress on you to agitate and agitate again, as it is only by so doing that we can expect to receive that to which, in these days of free-trade, we are so justly entitled. Do all and in every way in your power to support and strengthen the proceedings of the Central Anti-Malt-tax Association in London, and I have no doubt sooner or later some good must result. Gentlemen, I now leave the

subject, "Harvesting Corn and the Disposal of the Crops," for discussion in your hands, and will only add in conclusion that the comparative difference in cost of cutting by the scythe, the hook, or the machine, and also of thrashing by steam or horse-power, is trifling, the advantage being in the convenience of doing a large amount of work in a seasonable and short space of time and the proper disposal of the straw; but at the same time, a method which may be pursued with the least real expenditure is not always to be chosen for that reason alone.

Mr. UDALL observed that it was now the rage to recommend steam and machinery for every purpose to which they could be applied, and some people were unbending advocates for steam thrashing. It might be very good under certain circumstances; but as regarded Lent corn, and looking at the value of the straw for feeding, he thought the thrashing might be done with the flail cheaper and more advantageously. Now if they hired a machine for a week they would not thrash above 30 quarters a-day; and let them calculate what would be the cost of thrashing those 30 quarters. Besides the hire of the machine they would have to pay the engine-man and stoker, 4s. a-day for the two; a day's consumption of coal, 7 cwt., would come to say 7s.; ten men at 18d. a-day would be 15s.; cost of supplying water say 4s.; and the proportion of fetching the machinery to the farm 2s. 6d., as an average for the day. This would give a total of 32s. 6d. for thrashing 30 quarters, or 1s. 1d. per quarter, to which they must add 10d. per quarter to pay for the hiring of the machine. This would give 1s. 11d. as the cost of thrashing a quarter, while he could get his oats thrashed by hand at 1s. a quarter, and barley at 1s. a quarter. He believed it was thrashed equally clean, or cleaner; the barley was of better quality; and the straw, as well as of oats, was of twice the value for feeding purposes, as it could be provided fresh from day to day as it was required for the stock. Therefore, although they were recommended steam machinery in everything to which it could be applied, in some instances perhaps they were not altogether right in discarding manual labour, though he did not mean to say that under certain circumstances steam was not highly advantageous.

Mr. C. BUDDEN suggested whether it would not make a difference in the comparative cost where they had a small steam-engine of their own, which might otherwise be usefully employed to do anything else they wanted when not required for thrashing, and thus lessen the number of horses kept on the farm. In many places labour was scarce, and it was often difficult to get men when they wanted them, so that then it resolved itself into a question between steam and horse-power.

Mr. READER thought they must be much obliged to Mr. Chapman Saunders for the very able manner in which he had brought the subject forward, the first part of which he had quite exhausted. He was in favour of having a steam-engine of their own, suitable to the farm they occupied, as they were often put to great inconvenience in hiring. With regard to the disposal of the crop, this naturally brought them to the subject of the Malt-tax, which pressed so heavily upon one of the chief products of the soil. Now, when they had to compete with the foreigner, who could make his barley into malt and feed as he pleased, he certainly thought the British agriculturists should be allowed to do the same without any interference on the part of the Excise. No other class in England would have submitted so long to the inconveniences and restrictions experienced by the agriculturists; and if the manufacturers had half as much to complain of as the farmers had, the Malt-tax would have been repealed long ago. Not only did it interfere with the disposal of the crop in the manner that would be most profitable and remunerative; but if they made it into beer for the benefit of those who by their own hands raised the crop, they had to pay a most exorbitant duty to the Government. But it was not only a producer's question, for it was one which affected the consumer very closely, and the man who drank his pot of beer had to pay 100 per cent. upon that commodity, in consequence of the operation of the tax. Then they also heard that the beer now sold often only tended to increase thirst, and produce a maddening intoxicating effect, owing to drugs which were used to give it a fictitious strength; but if the Malt-tax was repealed malt would produce a cheaper beer than they could brew any other way. Thus it was a subject in which the general public were deeply interested, and they ought to join with the agriculturists in agitating for the repeal. As to the Government experiment in regard to feeding upon malt,

it was not conducted in a proper manner, for no one would think of feeding entirely upon malt any more than they would upon sugar; but it would often be highly valuable to add a relish and assist other food, while in itself highly nutritious. But on the fair principles of Free-trade the agriculturist was entitled to the total repeal of a tax which was the only remnant of protection; and the manufacturer ought to assist him in obtaining what was only justice. He trusted the Central Anti-Malt-tax Association would be still more generally supported, and that they would continue to press the question before Parliament until justice was done. He believed that all classes would ultimately reap considerable benefit.

The CHAIRMAN said it was very hard that they should be obliged to produce wheat at Free-trade prices, and yet have their barley so heavily taxed. He could use his wheat where he liked and for what he liked, but if he did so with his

barley he had to pay a tax of sixty or seventy per cent. upon its value. He certainly thought that every farmer should be allowed to use his barley on his own farm in any way he thought fit. With the present high price of meat also he thought the Chancellor of the Exchequer was doing a serious injury to the public by keeping on the Malt-tax, for if the farmer could use his barley as he liked he would be able to produce more meat. They were certainly now offered the chance of malting for feeding purposes, but it was under such restrictions that it could not be done with advantage. If the excise-man had anything to do with it they must give it up. They must, therefore, agitate for the total repeal with increased energy, and never say die till they are dead.

On the motion of Mr. UDALL, seconded by Mr. R. RAN-DALL, a vote of thanks was passed to Mr. Saunders for so ably introducing the subject to the meeting; and that gentleman having returned thanks the proceedings terminated.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, Nov. 1.*—Present: Lord Tredegar, President, in the Chair; Earl Cathcart, Lord Chesham, Lord Feversham, Lord Walsingham, Major-General the Hon. A. N. Hood, Sir J. V. Shelley, Bart., Sir T. Western, Bart., M.P., Mr. Acland, M.P., Mr. Amos, Mr. Barthropp, Mr. Bowly, Mr. Burgess, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, M.P., Mr. Druce, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Holland, M.P., Mr. Jonas, Mr. Lawrence, Mr. Pope, Mr. Randell, Mr. Rigden, Mr. Sanday, Mr. R. Smith, Mr. Thompson, Mr. Torr, Mr. Henry Wilson, Mr. Jacob Wilson, Mr. Frere, Professor Simonds, and Dr. Voelcker.

The following new Members were elected:—Atehison, William, 18, Cannon Street, London, E.C. Boulds, Cornelius C., Plymouth
Bulteel, John, Pamlete, Ivybridge
Cooper, J. R., Manor House, Barton, Bury St. Edmunds
Day, Richard, Hodroyd Hall, Wakefield
De Westphalen, Count Olemens, Laer, via Cologne
Garnier, Charles, M.A., 11, Grove Street, Oxford
George, Richard, Waterston House, Puddletown, Dorchester
Huntland, William, Rodley, Westbury-on-Severn
Houghton, John S., Railway Hotel, Southampton
Loye, Philip, Kingston Villa, Mannamead, Plymouth
Lyle, Joseph, Bonython, Helston, Cornwall
Smith, Roger, Plymouth
Turnham, George, Barnham, Thetford.

FINANCES.—Major-General the Hon. A. N. Hood, Chairman, presented the report, from which it appeared that the Secretary's receipts, during the past three months, had been duly examined by the Committee and by Messrs. Quilter, Ball, and Co., the Society's accountants, and found correct. The balance in the hands of the bankers on the 31st October, was £570 14s. 5d. The quarterly statement of subscriptions and arrears to 30th September and the quarterly cash account were laid on the table. The Committee recommended that the sum of £2,000 be sold out of the funds. This report was adopted.

JOURNALS.—Mr. Thompson, Chairman, reported that the prize of £50 for the best Essay on Middle-class Education had been awarded to the paper bearing the motto—"Mind rules Matter." The President having opened the envelope, announced the writer to be Mr. Robert Vallentine, Bareot Lodge Farm, Leighton Buzzard. The papers written by the Rev. Lewis Evans, Sandbach, and the Rev. W. H. Beever, were commended.

SHOW-YARD CONTRACTS.—Mr. Torr reported the recommendation of the Committee that the insurance on the Society's plant be increased to £2,000, and that Messrs. Easton and Amos be instructed to insure the machinery belonging to the Society, which is now in their keeping. The Committee considered the details of the preliminary

plan prepared by the Surveyor, under the direction of the Committee, and agreed to the same with some slight modifications. It was determined to construct sleeping places for the herdsmen and shepherds at the end of every alternate row of shodding. The Committee considered the rough plan prepared for the construction of new entrances, and the various offices attached thereto, and agreed to certain alterations. Also the form of specifications for the construction of—1st, the showyard, &c.; 2nd, the erection and removal of the offices and buildings now the property of the Society. The surveyor was directed to prepare corrected plans in accordance with the decision of the Committee, and to make the necessary corrections in the forms of specifications. The Committee directed the above should be printed for delivery to persons intimating their intention to tender, on payment of 10s. each. It was determined that advertisements be inserted in the undermentioned papers, inviting tenders, stating that the plans can be inspected at the Society's office after the 1st Nov.:—*Bell's Messenger*, *Mark Lane Express*, *Gardeners' Chronicle*, *Bulldog*, *Building News*, and *Midland Counties Herald*. This report was adopted.

BURY MEETING.—On the motion of Sir John Shelley, seconded by Major-General the Hon. A. N. Hood, Monday, July 16, 1866, was named for the opening of the Bury meeting.

A letter from the President of the Royal and Imperial Agricultural Society of Vienna was read, announcing their forthcoming Exhibition of Live Stock and Agricultural Machinery on the Prater of Vienna, in May, 1866.

Earl Cathcart, with a view to the due satisfaction of Exhibitors, moved that the following instructions be added to the instructions to the Judges of Implements, viz., "The Judges in the miscellaneous department are instructed to visit every stand of Implements in its numerical order, and to report accordingly, to place on the notice board each evening the number of the Stand with which they will commence their inspection on the following morning, and at 1 o'clock each day the number of the Stand from which they will proceed at 2 o'clock." The motion was seconded by Mr. Thompson, and carried.

On the proposition of Lord Cathcart it was arranged that Professor Voelcker should deliver a lecture at the Society's house, on Tuesday, the 12th December, at 8 P.M., on Disinfectants, in relation to efficiency and cost, including all the more recent chemical discoveries, and having reference to buildings, ships, railway trucks, and generally to the health of live stock, the prevention of infection, and the treatment of infected hides and carion. The inquiry will not lose sight of the influence of the free use of the several disinfectants as regards the agricultural value of the manure so treated.

THE GAME LAWS.

At the Social Science Congress a meeting was held of the Section of Agriculture in one of the halls of the School of Arts, Mr. Holland, M.P., presiding.

Mr. GEORGE HOPE, Fentonham, read the following paper on the subject of the game laws. He said: The game laws consist of numerous Acts of Parliament, which restrict the killing of certain wild animals, denominated game, to particular seasons, and by certain individuals who must also first obtain a licence from Government to enable them to do so. Partridges, pheasants, moorfowl, ptarmigans, heathfowl, snipes, or quails are termed winged game; and hares and rabbits ground game. Deer, I believe, are also game, unless appropriated by enclosure in a park, when they become property, and the taking of them is punishable as theft. Game at large has never been held as property, and these laws, therefore, are only founded on expediency, or rather the strong will of the governing classes. To mitigate some of the acknowledged evils that flow from them, it has been strongly advocated that the law should declare all game to be property, and to belong to the owner of the land on which it is found. But it is impossible to hold animals to be property which cannot be identified, and who can tell the difference betwixt one partridge or one hare from another of the same species, as they fly over or run across the country? besides being animals which may become the property of half-a-dozen different people in a few minutes. The law might declare such animals to be property, and punish the taking of them as theft; but this remedy appears to me more likely to confound the sense of right and wrong, and thus to weaken the security of all other property, than to attain the object intended. Blackstone, in his Commentaries on English Law, observes: "From this root (the forest laws) has sprung a bastard slip, known by the name of the game-laws; both founded upon the same unreasonableness of permanent property in wild creatures, and both productive of the same tyranny to the commons, but with this difference—that the forest laws established only one mighty hunter throughout the land: the game laws have established a little Nimrod in every manor." The natural right of every man to hunt and kill wild animals was long maintained in the Roman law, and was recognized and acted on in the earlier periods of British history. The right was usurped by the feudal barons, and it has continued to the present day to be essentially an arbitrary privilege of the wealthy and aristocratic classes. In the time of Richard II. it was enacted that no artificer, labourer, priest, or other clerk of small income, "shall have or keep from henceforth any greyhound, hound, or other dog, nor shall use ferrets, nets, &c., to take deer, hares, nor conies, nor other gentlemen's game, upon pain of one year's imprisonment." This law has been repealed, but the same spirit runs through every later enactment: it is at the peril of the lieges if they take or disturb "gentlemen's game." In Scotland, the right of killing game seems to have been enjoyed by the whole population up to a comparatively recent period. It was only in 1621 that the first statute in regard to this matter was passed by the Scotch Parliament. With characteristic brevity, it simply enacted, "That no man hunt or hawk at any time hereafter who hath not a plough of land in heritage, under the pain of one hundred pounds," which sum, being Scots money, amounts to £5 6s. 8d. sterling. This old statute still remains in full force north of the Tweed, and the penalty quoted admits of no modification, but is often added to the other penalties for trespass, and for the want of a licence to crush landless poachers, though no other qualification beyond the licence from Government is required in England. The differences betwixt the law as it exists in both countries, and various anomalies, common to both, must speedily attract the attention of Parliament. At present, almost every newspaper in Scotland is discussing the effect of proposed alterations or modifications of the amendment of these laws, and at least some advocate their total abolition. Even a cursory examination of them will show how vindictive, if not ferocious, the penalties are for any infringement of their enactments. Their effect is also most disastrous on the morals of the labouring class in the

rural districts. Within the last twenty years the convictions under them have increased from 5,000 to upwards of 10,000 in England alone. The losses sustained by tenant farmers from the destruction of their crops by game has long been a cause of just complaint, and it is admitted by every competent judge that high or profitable farming is incompatible with game preserving. I have a strong belief myself that all game laws might be utterly abolished with great advantage to the whole community; and if a more stringent law of trespass was thought necessary, that no special damage was instructed, a penalty not exceeding 40s. might be recoverable like other debts, besides compensation for any damage, even the carrying off of hares or pheasants by wilful trespassers. But I appear here as representing the Scottish Chamber of Agriculture, and I propose simply to advocate the resolutions agreed to by that body, and to show that these laws ought to be modified and amended, so as at least to render them more in harmony with justice and right feeling. There can be no reason for a qualification Act being in force in Scotland when none is required in England. In the latter country a tenant had full right to the game on his land unless he voluntarily divest himself of it in his agreement with the landlord; but in Scotland a tenant cannot hunt or kill game without the special authority of his landlord, however long his lease may be, even though it was renewable for ever. It is even matter of doubt if the owner of an entailed estate can legally grant a lease of the game for a term beyond his own life. On the other hand, proprietors and all authorised by them may hunt or kill game at pleasure in the fields and enclosures occupied by a tenant. Doubtless, a landlord had full right to make his own terms in parting with his land, provided he can get people to agree to them; but to let land first to grow crops, and then, it may be, to let the right of consuming these crops, or to retain it for himself, is, to say the least of it, unwise on the part of the agricultural tenant, and not very creditable on the part of the proprietor. In Scotland, tenants are invariably assured that the game will be kept down, so as to prevent injury to the crops, and this promise is generally kept by the great majority of landowners. Still there are numerous instances of great losses to tenants, particularly where hares and rabbits are preserved. It is true many tenants bind themselves to refrain from seeking all redress from losses of game, however much their crops may be destroyed. It is exceedingly foolish, but it is more so in appearance than in reality, as game damages are found to cost more in recovery, even when successful, than the amount claimed, that is to say if the landlord litigates the case, as he has it in his power to do, and generally does. If the suit is commenced before the Sheriff, it can be taken to all the higher Courts successively; but even if begun before the Lord Ordinary in Scotland, it can be carried to the Outer House, and then the Inner, and finally to the House of Lords. The decision there is final on the merits, but the amount of the claim falls to be settled by a jury trial, which may result in a new or second trial on the ground of the damages being excessive. The expense and anxiety of this course of action makes it wisdom on the part of the tenant to submit to the first loss, and endeavour as speedily as possible to get quit of the farm. Were actions for game damages to be final before the sheriff or paid magistrate, justice would be more easily attainable, and landlords would then become more chary of increasing game to an unreasonableness amount. But, besides the actual damage done by game, it is the cause of more jealousy and quarrels betwixt landlord and tenant than all other causes put together. I was lately shown a letter written by a proprietor to one of his tenants, dated only last month, and of which I took a copy as a curious specimen of the light in which some proprietors view their tenants, and the insolent conduct they sometimes, unconsciously, use towards them. In this letter the landlord complains that the son of the tenant "had been shooting rabbits, and without the slightest excuse in the way of their damaging your crops. Sometime previously my keeper and gardener saw your son and another person, near —, having a greyhound with a loose rope round his neck. Of course it

is not difficult to conjecture what was intended. You are yourself, I believe, aware of an incident where your son, and I believe two other persons, were distinctly seen to course several hares. Whether this was on my ground or that adjoining I am uncertain. However, I fancy it is very doubtful whether the proprietor's permission was given to such a proceeding." Finally, he "hopes he may have been misinformed;" but does not think having him for a tenant a subject for congratulation. Now there is not one word about game in this tenant's lease. Rabbits are by law game and not game; but they are not game to the tenant in this case, and he could shoot or trap them as he chose. The landlord, in fact, admits this, though he seems to think the rabbits should have first damaged the tenant's crops. I would ask what did they live and multiply on but the crops? they could not be there at all without damaging them. Then the boy seen with the greyhound, and the rope round his neck (a boy under nine years of age!) on the public road—why, he was simply taking home the animal that had strayed from a neighbouring farm, the same where the coursing took place. This story of the coursing is a beautiful illustration of the sort of tales carried by gamekeepers to their masters, and of the credulity of the latter. The keeper had seen "distinctly" this tenant's son and two other persons course several hares, but were unable to say whether it was on this farm or that, though it was on an estate where the tenant had leave to course, and where the boy went by invitation. Mark also the view the landlord takes of what he styles "such a proceeding" (the coursing of hares by a tenant). "I fancy it is very doubtful whether the proprietor's permission was given." The arrogance of this letter will be more apparent when I tell you that this tenant has spent several thousand pounds (not a penny of it made by farming) in bringing into cultivation some 200 acres, by trenching, liming, draining, and fencing with stone walls what was previously a barren heath. He was under no obligation to do so, and it is doubtful whether he will recover the whole of his capital. But one thing is certain: he will at the close of his lease return the farm to the landlord worth a great increase of rent, the effect of these permanent improvements effected by him with his own capital. Few tenants care about shooting or hunting. I believe not one in ten would use the privilege if they had it, and I have come to this conclusion from my knowledge of those who have or have had the sporting on their farms. But there is one thing they do dislike, and that is being watched and challenged for herdboys firing guns and sheep-dogs frightening hares. I will say further, tenants are glad to see the landlords sporting on their farms, provided the game is only sufficient for fair sport, and that it is not preserved for a single day's murderous slaughter, as is now the fashion, and the produce sent to the poulterer, to the diminution of that produce which should have been sent to the butcher. Partridges, even when numerous, do comparatively little harm to crops. Pheasants are very destructive, but they are confined to particular localities, where they are reared under hen-coops, and fed by the hand when young. They are excellent birds on the table, but I cannot see the sport of shooting such large half-tame animals. Cultivated land in the neighbourhood of preserves should be in the owners' hands; but if farmers do hire land in such situations they know what they may expect. Sometimes preserves adjoin the farms of other proprietors; and I have known some hard cases where the tenants' crops were greatly injured year after year by game reared on adjoining properties, and the tenants refused all redress. But hares and rabbits are the great causes of complaint, and they increase rapidly if only let alone. On many farms Swedish turnips cannot be left on the ground during the winter without great loss, as the hares break the skin of root after root, which renders them liable to be easily destroyed by frost. It is often impossible to lift them in the autumn without poaching the land in wet weather, and even if they could be removed, they are worth much more to consume by sheep in spring on the land where they grow. A perusal of the evidence given before Mr. Bright's Committee on the Game Laws cannot fail to prove the difficulties farmers have frequently to contend with in regard to game, and the damage done to their crops by hares in particular. The evidence of the late Mr. Pusey, Sir Harry Verney, and Lord Hatherton is most conclusive on these points. I will only quote a few words from Lord Hatherton's evidence: "I soon found, as a farmer desirous of introducing among my tenantry and into the neighbourhood a better system of cultivation, that it was utterly hopeless to

do so unless I completely destroyed the hares; for the attempt merely to reduce them was useless, for a good season repaired their numbers to such an extent that I found there was no effectual cure but destruction." And again: "Hares will travel miles to the nearest field of Swede turnips," a statement which I can personally corroborate. I have even counted one hundred hares on a young grass field on a spring morning, not half-a-dozen of which remained on the farm during the day, but retreated to their cover fully two miles off. No one who farms land extensively, or who takes a practical interest in agriculture, will continue long to consider hares game, or anything else but a nuisance. The Marquis of Tweeddale is well known throughout the kingdom as a most enlightened practical agriculturist. I do not know a single person who makes his bread by farming whose reputation for skill in agriculture stands so high as his lordship's does in East Lothian, or who has done so much in introducing and promoting a profitable system of farming. Now, his lordship preserves partridges and pheasants for sport to his friends; but hares are not permitted to consume either his own crops or those of his tenants. Lord Tweeddale also sets a noble example to other landed proprietors by his systematic destruction of wood-pigeons, which are a pest that cause more loss and expense to farmers, as a body, than even game; but they have increased to their present enormous numbers simply from extensive woods and plantations being devoted to the rearing of game, and by gamekeepers destroying all birds of prey. But to return to hares, I think it must be evident that their preservation in a cultivated country is quite irreconcilable with the interest of the general population. Whatever I have said as to hares applies with double force in regard to rabbits. Let both, then, on all cultivated land, be considered by the law as vermin, and after that landlords may make what stipulations in their leases they choose regarding them. There is one thing I decidedly protest against; and that is a licence, for even the smallest amount, being necessary for their destruction any more than for the killing of rats and mice. If a farm were let on condition that rats were to be preserved for sport to the landlord, and should a farm-labourer accidentally or even systematically destroy them, I do not think any penalties could be indicted on such a person or even on the tenant of the farm. But if the licences are retained (unless the sanction of the proprietor is granted for destroying them), nothing will be gained by any change that can be proposed. I know it is said, Why do not farmers make such stipulations in their agreements with their landlords as to ensure their freedom from game ravages? Doubtless it is in the power of a tenant to refuse to occupy land unless the game is let along with the right of cropping; but this is not and has never been the custom. The game has ever been universally reserved by the proprietor; it is impossible to obtain land on any other condition, and those who insist on having the game may make up their minds to retire from the profession of a tenant-farmer. It is the law, and the law only, that enables the proprietor to carry out his terms in regard to game. The tenant is the weaker party, and surely it is not asking too much to have so far abolished this law which enables the stronger party to carry out measures so detrimental to the rural population. But there are ways in which some farmers protect themselves from hares, and one is by laying an active man on the farm who knows how to set a wire. This is much more common than is generally supposed, but it frequently leads to great evils. I have known some old men who have snared hares from their youth, and who never went further; but as a rule it is merely a training for those who make midnight incursions into pheasant preserves. By a single night's work in these preserves as much money is realised as by a month of honest labour. Riots and dissipation and idleness are sure to follow. Necessity soon compels them to try it again and again. If caught at last, "To jail with them!" is the order. The chaplain there finds it impossible to effect the slightest reformation in them, as they indignantly deny they are thieves. They confess to having broken a law, but then it is a law of man's making, not of God's creating—for no one can say that these laws carry on their front the broad impress of truth and justice, which all laws ought to have. One great improvement in the administration of these laws would be to have the trial of offences under them conducted before the paid magistrates in England and the sheriffs of counties in Scotland, in place of the justices of the peace as at present. In the Night Poaching Act sheriffs are mentioned, and have jurisdiction; and all trans-

portable offences must be tried by the Court of Justiciary. Now, justices of peace are almost the only individuals interested in this matter; while their powers of punishment are great and arbitrary, and their judgments on the merits are final and conclusive. In both common and statute law judges are debarred from sitting in judgment where they or their friends have the remotest interest; but these game-laws have been enacted and are maintained for the sole benefit and pleasure of the very men selected to try offenders against them. One of the worst features of the game-laws is the cumulative penalties that may be heaped on an offender. A person trespasses in pursuit of game. He is taken in the act; and a justice of the peace fines him for such trespass. But he has killed a hare or pheasant; a second fine is inflicted for being in unlawful possession of game, not being a duly qualified person. If he pays these two fines, he is next brought up for want of a certificate; and instances are by no means rare of persons being thus punished three times for the one offence. To show that these punishments are not light, I will try and state shortly what the game-laws really are in Scotland. To kill game legally, it is first necessary to be in possession of a ploughgate of land—an undefined quantity, generally estimated at 60 or 70 acres. A person not so qualified having in his possession any game without leave from a qualified person forfeits for the first offence 20s. and for all others £2; and in case of non-payment within ten days, suffers imprisonment for six weeks in lieu of the former penalty, and three months in lieu of the latter. If charged with being also in pursuit of game without the qualification, the penalty in addition to the above is also £8 6s. 8d. A licence or game certificate is also necessary. A person acting without one is liable for a penalty of £20 with costs, and also in the amount of duty, and failing payment, imprisonment for six months. Prosecutions may be tried summarily, though the parties be absent, before two justices of the peace, or one justice, provided he is also a commissioner of supply—that is, the owner of land worth generally £100 a year. Sheriff Barclay, in his singularly instructive pamphlet entitled “Curiosities of the Game-Laws,” remarks on this—“It is declared that the conviction must be by two justices. But mark the strange addition: if a justice be also a commissioner of supply this is held to be equivalent to two justices rolled into one. Because he can add to his signature the ebalistic letters J. P. and C. S. he is held to be a judicial engine of two justice-power, capable of exercising the dynamics of two minds, or, in fact, ‘a man beside himself.’ We venture to say, ransack the legislation of all ages and all lands and such a monstrous anomaly will not be found as this, which blots our statute-book, and is in daily exercise in these highly-favoured lands.” A distinction is drawn in these laws between day and night poaching, the day time being the first hour before sunrise until an hour after sunset, the remaining time of the twenty-four hours being held to be night. A trespasser during the day forfeits a sum not exceeding £2, with costs. Where an individual is disguised, or five persons trespass, each person forfeits a sum not exceeding £5, with costs. If a trespasser refuses to leave the ground, and to give his name and address, he may be seized and conveyed to a justice of peace, and summarily fined £5 and the costs, or, as we say in Scotland, the expenses of process. In default of payment, the justices may imprison for two months, with or without hard labour. Under the Night Trespass Act any person entering upon land, open or enclosed, with instrument for destroying game, is liable to be imprisoned for a period not exceeding three months, with hard labour, and at the expiry to find caution, himself in £10, and security for the same amount for avoiding such offence for a year. Under this statute, the Sheriff of Haddington not very long ago sentenced an individual to one week’s imprisonment with hard labour; but, failing to find security, he underwent six months’ imprisonment in addition, with hard labour. So, for an offence which the sheriff considered a week’s imprisonment the proper penalty, the poor man, for being unable to find security, had to endure six months in jail, with hard labour. For the second offence, the primary imprisonment is extended to any period not exceeding six months, and the security then required amounts to £30 altogether; also, the term of bail to two years, and the imprisonment, failing caution, to twelve months—making in all eighteen months’ imprisonment, with hard labour. The third offence may be punished with transportation for seven years, or imprisonment, with hard labour, for a period not exceeding two years. Persons to the number of three entering on land for the purpose of killing game with fire-arms, bludgeons, or other

offensive weapons, are liable to be transported beyond seas for not less than seven or more than fourteen years, or to imprisonment with hard labour for a term not exceeding three years. Transportation beyond seas having now been changed to penal servitude for the like period, there arises an obvious conflict between the two modes of punishment. By an Act of 1844, the Night Trespass Act was extended to the taking of game or rabbits on any public road, in the like manner as upon land. Only the actual taking of game is necessary for conviction under this statute. It will be observed there is a very great distinction between the penalty or punishment for a game-law offence, depending on whether it has been committed during the day or night. For a day offence, the penalty is a pecuniary one, subject to modification, while for a night one it is imprisonment with hard labour, which cannot be modified. The offences are distinct and separate, and it must be stated under which Act the prosecution is conducted, as a minute of time or less would have the effect of placing the offence under either the one or other of the statutes. It is often difficult to determine whether offences committed in the morning or evening belong to the day or night, and the proof is frequently very unsatisfactory as to the exact hour the offence was committed, or the time the sun rose or set at the place. It would surely be better to return to the hours fixed for summer and winter by the old Act—repealed, I think, in 1831—than having the time fluctuating, as it is now, both morning and evening. Any person killing, selling, or buying, or having game in his possession in forbidden time, forfeits £5 for each bird; and in case of failure to pay within ten days, is liable to two months’ imprisonment for each £5. These penalties admit of no modification. In one case the combined penalties against one individual amounted to £220, and the consequent imprisonment to seven years and five months; but the private prosecutor restricted his complaint to four birds, or £20 of fine. But surely this is a power too enormous for any private prosecutor to possess in the punishment of individuals. Public carriers, too, are liable to it, though they may even be in ignorance that they have in their possession such precious carcasses as moorfowl or other game. That this law must be systematically broken is evidenced by the fact that the greater part of the licensed game dealers in London and elsewhere present for sale any quantity of the different varieties of game on the morning of the day on which their being killed is lawful. At the close of the Parliament of 1862, an additional game-law was placed on the statute-book. It applies to the whole kingdom, and its chief provision was to enable the police to act as gamekeepers. It empowers them in any highway or public place to search any person they suspect to be a poacher, and also to stop and search any cart or other conveyance in or upon which they suspect game to be carried. But this search can only take place on a highway or public place, so that the poachers have only to leap a hedge and set their pursuers at defiance. In some counties in Scotland gamekeepers have been sworn in as constables to meet this difficulty. Gamekeepers thus become the servants of the Queen though remaining the paid retainers of private individuals. This Act was vigorously but unsuccessfully opposed. It contains several anomalies which renders it still doubtful how far it is workable in Scotland and Ireland. It places rabbits again in the list of game animals, and even increases the penalties for game offences; for simple trespass, for instance, from £2 to £5; and as the previous Act is not repealed, it is probable an offender may be mulcted in the penalties under both statutes. The resolutions adopted by the Scottish Chamber of Agriculture were:—

“1st, That hares and rabbits be dropped from the game list.

“2nd, That all prosecutions for offences against the game-laws be transferred from the justices to the sheriffs of the respective counties.

“3rd, That cumulative penalties for the same offence be abolished.

“4th, That damages be made eligible by statute in all cases of injury caused by increase of game during the currency of the lease—the amount to be determined under the authority of the sheriff.”

If effect were given to these resolutions by legislative enactment, it would satisfy by far the greater proportion of agricultural tenants, would tend much to make a better feeling in society, and, if the complexities of these laws were simplified, and their cumulative severity diminished, so that even the object at which they aim would be better attained.

they would more generally enlist in their favour the feelings of the community.

Mr. ROBERTSON, of Dundonachie, Dunkeld, said he had listened with great pleasure to the able paper which had just been read by Mr. Hope; but there was one very important subject that had been entirely omitted by that gentleman. That subject was one which was now engaging a good deal of attention in connection with the game-laws, not only in Scotland but also in London, from the controversy which was now going on between Professor Leon Levi and the Duke of Argyll. It related to the great extent of deer-forests which were preserved in different parts of Scotland; and he believed it was fraught with so much importance that it would in a short time come to engage the attention of the legislature itself. Large tracts of land which had hitherto been used for the rearing of sheep, and from which a large amount of food for the supply of the people had been obtained, were now absorbed for the purpose of deer shooting. Only within the last month a very extensive grazing farm, which had afforded pasture ground for not less than 8,000 sheep, had been diverted for this purpose, and was now almost totally lost, so far as its capability of producing food was concerned. He had lately read a paper on this subject—written by a gentleman very well known in Scotland, Mr. Horatio Ross—in which he endeavoured to show that deer bring as much food into the market as sheep do. From his (Mr. Robertson's) experience, and from his knowledge of deer-forests, which was pretty extensive, he could say that deer forests were totally unproductive for the interests of the community. The whole of the Grampian range indeed—a large amount of territory which includes many thousand square miles—was now being laid entirely desolate, in order to find room for the deer. The preservation of these animals were highly injurious to the morals of the community, because a large amount of poaching was encouraged, and a great many evil habits were engendered by engaging in that unlawful pursuit (hear, hear). The late Duke of Athole, he might mention, was so convinced of the evils attending the preservation of deer, that he contemplated breaking up the great forest of Glen Tilt, and turning it again into a sheep walk; but he was sorry to say that these excellent intentions were frustrated by the death of that lamented nobleman. Mr. Robertson then quoted from Vattel, to show the bad effect on the community of the preservation of game; and he also read a few lines from Burns' poems, showing that the pursuit of game was apt to engender feelings of cruelty and lawlessness in those members of the community who engaged in it. He hoped the subject, which was one of great importance, would receive attention from the Social Science Association and from the country. He knew of no subject—and he supposed he was well acquainted with the state of Scotland generally as any Scotchman of the present day—in which the agriculturists of Scotland were more deeply interested.

The CHAIRMAN (Mr. Holland, M.P.) thought that in connection with this subject the association ought to be very much obliged to Mr. Hope for favouring them with his very interesting paper, and he congratulated Mr. Hope on the fact that the subject of the game-laws was the first that was brought under the consideration of the members of the Chamber of Agriculture which he himself had been the chief agent of founding in Edinburgh. The establishment of the Chamber was indeed a great rise to agriculture. It threw her more into the social scale than she had ever been placed before, and the result would be that not only would they, in course of time, do away with the game-laws, but with many feudal matters which now interfered with the due cultivation of the land. The question of the game-laws had now been before the public for a long period. Ever since Mr. Bright's committee made their report it had been brought forward from time to time, and that report had been quoted, quotations from it had been read with avidity by those who were most interested in the management of game and in the prevention of its being a check upon the occupiers of the soil. With regard to the division which took place in Parliament some years ago—in 1862—he might say that this was considered an extraordinary division on the part of those who were in the minority. It was a larger and a stronger minority than had been anticipated. He had the pleasure of voting in that minority, and those who voted with him felt convinced that the game-laws would be a question which would not very long be prevented from coming again before the public, and that at length—before many

years were over—the feeling of the public and of the landed proprietors would induce them to make such a change in the law as would benefit the occupiers, and at the same time would produce on the part of the labourers a great inducement to avoid those immoral habits which had arisen under the system of game preservation, and which had caused so very much crime in the course of those years during which the game-laws had been in existence. That crime had been increasing in amount year after year, and was telling sadly against the morality and good behaviour of the lower orders of the population. He trusted that through the exertions of Mr. Hope and others, not only in Scotland but in England, they would soon find that the existence of the game-laws was limited.

Mr. HENRY WILSON, Mansfield, Notts, said that until the matter was thoroughly ventilated, and until the public mind was brought to bear on the subject, they could scarcely expect to get any alteration in the game-laws. He was surprised to hear some of Mr. Hope's statements, as, for example, that there had been 10,000 convictions for offences against these laws; and he thought if these facts were placed prominently before the public they would see that this was a matter which affected not the owners or occupiers of land only, but the whole community. One very important consideration was the position which the landlords themselves occupied through the operation of these laws. Only yesterday he was told by a respectable farmer that he had got notice to quit his farm. On asking the reason, the farmer informed him that he had been fool enough to talk too much about the game-laws. He had been complaining of the damage done by the game to his crops, and his landlord, not liking to hear so much about the matter, gave him notice to leave. That was the way in which free speech on this subject was sought to be put down.

Mr. GEORGE HURST, Bedford, said that a great deal of the peaching which was so much complained of arose, not from the fact of the preservation of game, but from the very unfortunate circumstances in which the agricultural labourer was too often placed. During the winter-months and a great part of the summer months, a great proportion of the agricultural labourers in the country were unemployed; and as their remuneration when they were working was small, they were glad to take advantage of any opportunity of adding to their own and their families' subsistence. He thought the game-laws might be greatly improved, especially in the way of simplification; but he did not see how they could do away with them altogether. The game must belong either to the owners or to the occupiers of the land; and, as between the one and the other, an agreement must determine who had the right to kill game. He did not see that the tenant had anything to complain of, if he took his farm knowing that the landlord reserved to himself the entire right of shooting over it. If damage were done to the crops from game, it was one of the consequences of the agreement the farmer had entered into.

Mr. T. WYCLIFFE WILSON, Sheffield, thought that the last speaker had entirely misapprehended some of Mr. Hope's remarks. That gentleman did not mean that there should be a right given to every one to trespass over unenclosed lands. Indeed, in the event of the game-laws being altered or abolished, it would only be right that a stringent law of trespass should be passed; and that would have the effect of removing the objection which he had stated.

Mr. EDGAR (Secretary of Department) remarked that Mr. Hope had scarcely dealt with the law of the subject as it affected England, and as laid down in an elaborate judgment of Lord Westbury in a recent case. He would like to ask Mr. Hope whether it was the case, as stated by one of the speakers, that many agricultural labourers were idle several months in the year?

Mr. HOPE said that in Scotland there was no such a thing as a labourer being unemployed for part of the year. The agricultural labourers there were equally well employed throughout the whole season. With regard to the legislation necessary if the game-laws were abolished, he had distinctly stated in his paper that, if the game-laws were abolished altogether, they must have a trespass-law, and that that law should be made to apply even where no damage had been done. He would, however, have the penalty of moderate amount—say about forty shillings, which would probably prevent some of those murderous conflicts which took place between the gamekeepers and the poachers, the latter being tempted to resist to the utmost, owing to the severity of the

penalty. He believed that, even if the game-laws were greatly modified, the game would still be sufficiently plentiful, although it would not be so large as to be destructive to a farmer's crop. Things were so bad at present, that in some cases they employed men to snare the hares. This was a very bad state of things for farmers to be exposed to; and he hoped they would soon see an amendment of the law in regard to this matter.

This closed the discussion, and the section adjourned.

The following paper was also read:

THE GAME-LAWS:

THEIR EFFECT ON THE AGRICULTURE OF GREAT BRITAIN, AND ITS SOCIAL SYSTEM GENERALLY.

BY THOMAS M'COMBIE.

There are two distinct heads under which the following remarks are classed: 1. The effect of the present game-laws upon the agriculture of this country. 2. Their influence upon society, especially the poorer classes. The warm interest which has been exhibited recently in the game-laws and game-preserving induces me to propose, at the "Committee of the Fourth Section of Trade and Economy," that the whole subject should be taken into consideration at the present meeting of the Social Science Association, at a special subsection on agriculture. I do not think that too much attention can be bestowed upon this important question; and I regret that I do not feel myself competent to do it full justice. I only desire, however, to introduce it, in order that able men may express their opinion upon what must be regarded as an anomaly in legislation, and a social grievance of some magnitude. The few remarks I shall offer will be rather of a practical than theoretical kind, and I hope it will be considered in a liberal and comprehensive spirit. I should hardly, however, have thought myself justified in wasting the time of this section by entering into any dissertation upon the historical phases of the question. Simply taking the game-laws as we find them now in existence, let me consider, firstly, their effect upon the agriculture of Great Britain. The tenant farmers are in a very different position now from that in which they were placed in the feudal times, some centuries back. In not a few districts, they are almost universally well-educated and independent-minded men, who pay a high rent for the land they farm, and, in reality, owe little favour to the owners. The market for land is similar to other markets—the owner is generally compelled to let, and the occupier to lease land. This differs little from purely commercial transactions; and the sooner it comes to be recognised as such the better for all the parties interested. The farmers are the great producing class, on which the other classes, to some extent, depend for food. The greater the quantity of animal and vegetable food which they can produce, and the cheaper the necessaries of life, the better for all the consumers in the country. I think one of the most objectionable features of the game-laws is this—that they have a sure tendency to decrease the amount of food actually produced in the country. In those parts where hares and rabbits are abundant, this is more especially the case, as the grain and other crops are often destroyed. Did the landlords merely preserve the game for their amusement in fair sport, there would not be so much to complain of; but, in numerous instances, they turn the matter into one of commercial profit. On many properties, waggon-loads of game are taken to the markets and turned into money. This is certainly an abuse of sport; and it is not much to be wondered at that a good deal of ill-feeling has been engendered between the landlords and their tenants. The latter give the highest rent for the land that in most cases can possibly be squeezed out of them, and it is very hard upon them to have to keep up the wild animals so that a second rent may be obtained. They know and feel it is a gross imposition upon them, which they are, in the majority of cases, unable to resist; indeed, in many districts, so great is the competition for land that they are frequently compelled to take it on the owner's terms. Game preserving is thus no longer merely for sport such as amused the older class of gentry; it is a system of wholesale breeding and slaughtering to supply the London poulterers; and this is all done, not at the cost of the landlord, but of his tenants. This new system has been gradually introduced, and the raw

and new farmer, in competing against those of experience, knows little of what he has to endure from the landlord's game, and he only makes the discovery when too late, and has to endure a gradual decay of means from the depredations of wild animals. The landlords have the tenants bound down by leases which compel them not merely to protect the game, wild fowl, fish, &c., upon their farms, which are all reserved for the landlords, but also to renounce any claim for damages they might have, whatever the amount of loss; and in particular cases, which are well authenticated, the holders of farms have had half their crops eaten up. But the worst feature in these leases has not even yet been stated. The tenants are bound to leave at the first term after found killing, or countenancing any one who is suspected of killing game, and throwing up all benefit from improvements or otherwise under the leases. I know that this fact will scarcely be believed, yet it is quite true; and to prove that it is so, I shall here quote portions of leases which are strictly enforced on four of the largest properties in the North. I may state that these were quoted by my brother—William M'Combie, of Tillyfour, the well-known stock breeder—in speaking on this question at the public meeting in Edinburgh, which was held to consider the game laws. [Mr. M'Combie here quotes from his brother's address, at Edinburgh, the various clauses from leases which have already been published and are well known.] To show that the injury sustained by game on many farms is considerable in amount, I may mention that a case was quite recently brought before the public of a farmer's losses, and the fact remains uncontradicted. A particular farm had suffered from the depredations of game, and no restrictions being in the lease, the occupier received a very large sum as compensation for losses, I believe as much as some hundreds of pounds a year. The new tenant signed a lease which deprived him of this right, and the consequence was that he found himself very speedily a ruined man, and the landlord would do nothing to assist him or pay him one farthing for his losses. Now, the right of the landowners to the exclusive right of the game is even at this time very doubtful. They cannot kill a head of any kind of game without a licence from the Government to do so, thus showing that the wild animals are even yet common right and not merely vested property. The right to kill game until very recently, say 250 years back, was in most parts of these kingdoms enjoyed by the whole of the people. The wild animals that roam the country free and unconfined never can, in any reasonable sense, be private property; and it is only by laws of a most stringent and obnoxious character that landlords have been able during recent times to enforce their unconstitutional claims. These preserving efforts culminated in Sir Baldwin Leighton's Act of 1862, which makes all the police of the country spies and game preservers for the landlords, and authorises them to search any person on the Queen's highway whom they suspect to be illegally in possession of game. The means by which the landlords have effected their great object and by indirect legislative enactments had game declared to be property, has been combination. From their influence in Parliament, which has for many years preponderated, and from having no tenant antagonism to contend with in that great political arena, every measure calculated to repress the right of the people to the game has been carried, and an injustice to the people, and a heavy loss to agriculture, has been perpetrated. The most effectual method of coping with the combined influence of the landowners in this country would be a Tenant Defence League, through which the whole tenant farmers of the United Kingdom should unite themselves together and bind themselves not to rent land on any consideration whatever, unless the power to kill destructive game were conceded. In this way they might protect themselves from that constant and steady infringement on their fair rights which has been going on for a long time. The great obstacle towards obtaining a proper reform of the Game-law grievance hitherto, has been the backwardness of the tenant farmers, who have been so abjectly afraid of offending the landlords that they could hardly even be prevailed on to come forward prominently in any agitation for their improvement to even speak the truth. This want of independence will, I hope, from the increasing effect of superior education amongst the more extensive cultivators of the soil, speedily disappear. Their own interests, as well as those of the country at large, are at stake, and public duty calls upon them to act boldly. There have been four Parliamentary

Committees on this subject during the last forty years, which have been all wrung most reluctantly from the different Governments; the evidence taken in all the four was condemnatory of the game laws, but no relaxation of them has ever been obtained. Rendered bold by the impunity into which the pressure against them had been resisted, the landlord influence forced the Bill of Sir Baldwin Leighton upon the country. The same party, in the subsequent session, defeated the motion of Mr. Forster, the member for Bradford, for a Committee to inquire into the operation of that measure, thus showing their determination to stifle free inquiry into the subject. This was the more extraordinary, inasmuch as the working of the Act had clearly demonstrated that inquiry was absolutely necessary. There had been conflicting decisions of different county benches upon the subject as to whether the *onus probandi* lay on the complainant or the defendant. Not a few of the magistrates decided that, on a charge being exhibited against a man, he was bound to prove his innocence—a most tyrannical decision, contrary to the spirit of English law, which holds every one innocent until proved guilty; and almost unworthy of the dark ages, when the liberty and life of the subject were held in small estimation by the magistrates of the land. The country gentlemen flatter themselves that they will permanently secure the right of property in game without paying rates and taxes on it, and have the police turned into amateur keepers to protect it for them; but, on the other hand, intelligent men think they have already gone too far, and that, in the strong reaction which must ensue, the severity of the existing law will be relaxed. The Government of Lord Palmerston is free from blame in this last instance; indeed, Sir George Grey warmly supported Mr. Forster's motion, and was scarcely able to get a hearing from the House of Commons when enunciating the views of the Government on the subject. The Home Secretary declared upon this occasion that nothing could be more anomalous than the present state of the law on the game question, and we have therefore cause for hoping that a material alteration will be made at no distant day. The friends of liberty and social progress have no cause to regret that Sir Baldwin Leighton has not been re-elected to the present Parliament; the influence of the tenant-farmers having been sufficient to keep him out. The necessity for a sifting investigation into the subject is, perhaps, rendered more apparent by the difference of opinion existing amongst the highest legal functionaries of the country on many points which have recently been brought prominently before the public by the case of *Blades v. Higgs*, and others, and in which the decision of Mr. Justice Willes, who held that a man's property in land did not give him any right to property in animals of a wild nature after they became old enough to escape from the land, was upset upon appeal, and the contrary doctrine affirmed. This would show that the law recognized in most civilized countries, which was apparently the law of this, is no longer so. The game is now held to be the property of the owner when killed and taken, and if so obtained by a trespasser he is held to be in illegal possession of it, and the game legally to revert to the owner of the soil. The Lord Chancellor, however, gave the decision partly on technical grounds. He said, "This conclusion would not be affected, even though it be true that an indictment at common law will not lie against the trespasser for killing and carrying away of game, if it be one continuous act, inasmuch as the ownership of the game is considered as incident to the property in the land; but this consequence is the result of a peculiarity in the law of larceny, which holds that the act of severing and taking away things attached to the freehold is not a felonious taking, a result which does not affect the existence of the right of property." I now come to the social effect of the game laws, and their influence upon the morals of the people. That game preserving and its never-failing attendant, poaching, has demoralised the working population of this country, must be admitted. The law of England would now appear to give the landowner the same right in game on his land as in cattle or sheep, or tame stock; but the people do not recognise this as just. Poaching is, therefore, resorted to by very many who would not steal, or injure property generally; but it has such degrading associations that the moral sentiments are weakened in its pursuit, and its votaries very often end in becoming thieves, drunkards, and even, sometimes, murderers. Were there no preserves, there would not be half so much poaching; and it is the temptation thrown in

the way of the working-classes which leads to crime. Landlords contend that they have a perfect right to preserve game, or, in fact, do anything they think fit with their own property. But this is by no means so clear, in cases where a certain injury is inflicted upon society. It appears extremely selfish for any gentleman, merely to gratify his taste for sport, to inflict a nuisance upon the country, tempting large numbers from the paths of virtue into vicious habits and reckless dissipation, and crowding the prisons and penitentiaries with criminals young and robust, and able to work. The law may recognise game as private property, but the nearly unanimous voice of the public rebels against the idea, and poaching has never been held to be so heinous as any other offence against property. The man who steals a horse or sheep is so far degraded in the eye of society as to have no sympathy; but the crime of the poacher is not stigmatised, and has popular feeling in its favour. Nothing can be more injurious to the society of a country than laws which conflict with the moral convictions of the great majority. The poorest admit the justice of the laws which protect life and property, and all agree, when offences against either are committed, that the offender should be punished. Not so, however, in infractions of the game laws. Those who are punished on that score regard themselves as martyrs to class legislation—as men punished by the tyranny of those above them for no real crime, and they command the hearty sympathy of the whole working people, which is clearly on their side. But the poacher seldom stops at killing game; he becomes unable, or unwilling, to work steadily in the ordinary hours of labour, and takes to more dishonest courses; he comes in contact with gamekeepers and police, and in time regards bloodshed without horror; he is led into bad and dissipated habits; and thousands, who but for the first temptation through game preserving would have been honest members of society, end their days in penal settlement or the gallows. The correctness of these opinions may be proved by a parliamentary paper, of date 19th of July, which shows that, during the last year, there were 10,117 offences against the game laws, and of these 8,527 were for trespassing during the day in quest of game. It is not disputed that a large amount of the crime of the country is connected, either directly or indirectly, in country districts, with the infringement of the game laws, and that such offences are largely on the increase. The country proprietors having carried all their points, so as to have the police charged with preserving the game and having it declared private property, and every other concession asked for from Parliament and the courts of law, are now busily engaged in numerous instances in extending their preserves, and thus increasing the temptation to the poor to take to poaching. The fact that the system is tending towards the demoralisation of the people makes it a great national question, and justifies us in calling loudly for legislative interference, in order that game-preserving may be, if not abolished, at any rate maintained within more reasonable proportions. It is a remarkable fact that, while the punishment has been increased, the result, so far from deterring, has had the contrary effect. Prior to 1862, the penalty for the first offence was £2; after that it was by Sir Baldwin Leighton's Bill increased to £5; the consequence being, that the number of offences since are double what they were before the increase. The greatest part of those convicted were so convicted for trespassing in the day time after game, which is not deemed so disreputable and hardened a kind of poaching as night work, the punishment of which is much less severe; the one being by fine only, the other by three months' imprisonment for the first offence, but at the end of that period, unless the offender can find security that he will not trespass in a similar manner, he is liable to be continued in prison for other six months. The extra severity of the laws seems to make our countrymen more reckless in disregarding them. Englishmen in humble life seem to think the game is the property of no particular person, and the more the proprietors determine to punish for killing it, the less they think the offence deserving of reprobation. The offence of killing wild animals is by no means one of a heinous kind in the eye of society generally, and the ease with which landlords have been able to increase the penalties for it says little for the character of our legislation. In the records of the various committees on the subject were the fullest and most conclusive evidence against the bill of 1852. Yet despite this and the efforts of a few independent men, the obnoxious measure passed into law. Now, it says

but little for the civilisation of a country when law and public feeling are in antagonism and run in contrary directions. The fact that the public generally view killing wild animals as no offence against morality is the surest condemnation of the stringent game laws that have been lately passed, and if the vote were taken there would not be five per cent. in favour of the last law passed in 1862. What, then, can we think of a representative assembly which, taking advantage of the accidental position of its members, should pass a measure so selfish and tyrannical as to be execrated by nearly every class in the country? Were the landlords merely desirous of preserving the game for their own use or legitimate sport, the poor might have some sympathy in their views; but when, in numerous cases, they rather let their shootings off sell their game for their own benefit in London, it can scarcely be expected that such a feeling should exist in the breasts of the other classes. There are many landowners who wish to have double rent out of the land, and then either sell the game or let the land to such as do sell it, and the working-classes form their own ideas of the want of high tone in such trans-

actions, and deem it a small crime to shoot hares or rabbits if the chance comes in their way. Such are some of the evils of the laws running contrary to the public opinion of the class called upon to preserve them, that it weakens their respect for the institutions under which they live. It may be argued that all landlords are not alike tyrannical in causing these laws to be administered with the severest rigour; but those who have the good sense to see the impolicy of such severe Acts of Parliament ought to be the first to desire their repeal. The public have no right to be compelled to take as a favour from any one what they are entitled to as a right. And there is ample necessity for the immediate interference of the legislature, and for a combination of that portion of the public more immediately interested. If the greatest good of the greatest number be the aim of all legislation, then these laws should be repealed or ameliorated. Every friend of social progress and the elevation of the working-classes must earnestly hope for an improvement in our mode of legislation in this important question, and for the blotting out of such unconstitutional acts from the Statute Book.

THE OVER-PRESERVATION OF GAME.

At the Freshwell Labourers' Friend Society, Colonel Brise said: During the last week or so there had been some correspondence and lectures in the different agricultural newspapers on the subject of the preservation of game. He was struck with one of the observations made, and was induced to look into the subject more closely than he otherwise should have done. It was stated that the preservation of game was an injury to the country; that the man who preserved game was an injury to his country, an injury to his neighbourhood, and an injury to himself. Well, he thought that was strong language, and said to himself, "Let us look at the facts of the case, and see if it is so;" and on looking into the matter, and considering it thoroughly, he could agree with this gentleman so far—that an unfair or over-preservation of game was an injury to a man's country, to his neighbourhood, and to himself; but a fair preservation of game he did not think was an injury in any way to either one or the other. A fair preservation of game only tended to promote healthy exercise and social intercourse, and gave an opportunity of meeting one's friends and spending pleasant days together, and so on; and it was also the privilege of the owner of the soil that he had a right to the game on that soil; and indeed, if that were not so, he thought there would be very few men who would care about investing their money in land at 2½ per cent.; for only the other day a friend of his, who had bought an estate not very far off, said to him, "What a fool I must be to go and purchase an estate which will only pay me 2½ per cent., when I might get 10 per cent. for my money in London." If gentlemen were satisfied with a small return for their money, they deserved to have some privilege as well.—[Mr. Keeble: Fox-hunting.]—Well, they would have something about that presently. There could be no doubt that, if it were not for the sporting, gentlemen would much more frequently absent themselves from their estates, and we should have what was the curse of Ireland at the present time—absentee landlords. Over-preservation of game was a different thing; for it had been said that the necessities of life were damaged to a great extent by animals kept for amusement and luxury, and in this way, no doubt, over-preservation was injurious to the country. We had heard a great deal as to how much a rabbit ate, and some people said that two hares and two rabbits would eat as much as a sheep; and if that were so, great injury was done to the country by keeping too many hares and rabbits. But a fair preservation of game depended on what was considered the number of hares, and so on, there ought to be on an estate. Now, he believed it would be generally admitted that partridges did no harm whatever, that rabbits ought to be killed like rats, and that hares should be allowed up to a certain number. A gentleman who gave a lecture on the subject the other day, and who seemed to think he knew all about it, said there ought only to be one single hare to four acres of land.—[Mr. Portway: Too many.]—That was something like 25 hares to a hundred acres, 250 to a thousand acres, and 750 to three thousand acres; and he must say that

though he had preserved game in his time, he had never committed such an excess as that. He doubted whether one hare to every four acres was a fair proportion; he thought it was too much. He thought one hare to ten acres was ample, and even a hundred hares to a thousand acres would be a very large proportion, and if there were less it would be better. But then it was said that the preservation of game was an injury to a neighbourhood. But he thought a fair preservation of game would be no injury; on the contrary, it would be rather a benefit to the adjoining owners of land, for by preserving the game a man helped to stock the country, and to afford healthy exercise and sport to his neighbours and friends, and was also enabled to send presents of game to his friends around him. But when he went beyond that—when he came to over-preservation of game, he thought he was doing an injury to the neighbourhood. No doubt it was an annoying and irritating thing to a tenant to find his turnips, wheat, or barley carried away surreptitiously by four-footed animals like his landlord's game, over which he had no control. It must be a most annoying thing to a farmer who prided himself on his crops to see in the spring-time of the year, when his hopes were high, his growing corn bitten off and nibbled away by animals, toward whom he could not but feel a great antipathy. This would not tend to cement the good feeling between landlord and tenant, because however good a fellow the tenant might be, he must feel much annoyed and aggrieved at the time; and though it was probable—and no doubt in most cases it was so—that after a time the landlord compensated him and they were good friends again, yet a wound had been inflicted at the time, and it would be just as well if it had not been inflicted. But there was said to be another injury to one's neighbours attendant on the preservation of game. He heard something said just now about foxes, and it was a very difficult thing indeed for an owner of land to carry out the preservation of foxes if he preserved the game. It could only be done by stringent measures being used, and the keeper being made thoroughly aware that his situation depends on whether the hounds find a fox in his cover or not. But the keepers, he believed, were often unjustly accused in this matter. We knew there were many hen roosts in the country, and foxes sometimes were very fond of hen roosts; and he had known cases where ignorant men had been employed to prevent foxes robbing hen roosts, and they had been destroyed in that way by men who did not know what they were about in destroying so valuable an animal as the fox. It was not just that the landlords should incur all the odium when the foxes were destroyed, for it was often the necessary consequence of employing dishonest servants, but it was their duty to see their servants were honest so far as lay in their power. He thought they might attribute the paucity of foxes not so much to their being destroyed as driven from their covers. The constant traffic of the keepers in the covers where game was preserved did not tend to keep the foxes

there, and it was a great chance if they found a fox in the same cover, although possibly he might be in the neighbourhood, and not very far off. This was a very important subject to them all, and one well deserving of their consideration; and he did think, as he said before, that a fair preservation of game was an injury neither to their country, to their neighbourhood, nor to themselves, but an over-preservation was, if it were an injury to themselves—if a man, for instance, chose to spend his money in preserving for his own amuse-

ment—that was his own look out. No doubt game preservers were little aware what damage was done to the underwood and timber by the game in their woods. He believed the underwood was materially damaged by game, and that the growth of young oaks was prevented altogether. He would not detain them much longer on that subject. They had something else to do besides hunt and shoot, though hunting and shooting were a pleasant relaxation from their duties.

THE NEW FARM.

At last the blessed rain! cleansing the foul sewers, giving drink to the grass roots, washing mildew from the swedes, reinspiring the croquet-lawu, bringing home the wells and refilling the old village ladies' tarred-barrel reservoirs, delighting the young mudlarks—to be led o'f in screaming terror an hour hence by exasperated maternity—but, above all, dispelling the dread malaria of typhus and cholera.

On the still pool of the river-bend, there beyond the willow, how the glad pellets dance, lightening and darkening in alternate sport! It is even as Byron wrote—

“How the lit lake shines, a phosphoric sea,
And the big rain comes dancing to the earth”—

He wrote, however, of his loved lake Lemau, little dreaming that his lines should ever be borrowed by a farmer to point the expression of a bucolic!

It is but a short three weeks since the above was written and left. Already how the wind howls around quite wintery, and the lovely October tints are being beaten away, and the general prevalence of colds and bronchial affections warns us how little we can trust the climate of perfidious Albion! How lovely was the weather we had previously, in the which your humble servant, being an Epicurean, revelled—a sort of second summer without the damp of the like Canadian season. But the good this broiling autumn did the tillage-farmer, who shall fairly recount?—to those especially who, like my unfortunate self, succeeded to a foul farm. This is a red sandstone formation, and in the sandy loam couch-grass seems to thrive luxuriantly, spreading out most rapidly its bunch of clawlike rootlets, each one in diameter no less than a full-sized pipe of Neapolitan macaroni.

The custom of this country is to scarify the stubbles directly after harvest—an excellent practice no doubt when the scarifier bites, which it will not always do, and when the ground is sufficiently soft for its tines to tear up the couch mass bodily. Still, under the best of circumstances, with this practice many is the rootlet broken off, and left as a cutting, to strike, against the planting of the spring. The plan of *ploughing in* the couch I like still less, as that is nothing less than deliberately setting new beds, and each separate severed stem of this pertinacious grass will grow.

The plan I find answer best, is to take off all but the share of Wootie's paring plough, and then go down into the soil some four to five inches deep. The fresh flakes of the last year's growth are thus thrown, like sods half-shaken of their soil, roots upwards, with scarcely one cut, in the sun, who rapidly does his part in turn. It is surprising how hard a surface this implement will break up. Then come the harrows and the roller—the scarifier afterwards, and then the chain-harrows to roll into cigarette form, for gathering, the withered masses that strew the surface of the fallow.

And then—what then? what is to be done with the

collected heaps? Should we burn? should we cart off and wash as fodder for the horses, as the French and Flemish do? or should we transport them to a heap in the corner of the field, and mix with lime and salt, to make the weed pay penalty as a manure in its turn?

Each plan I think a good one. The burning does, of itself, an infinity of service to the soil. The mineral ashes left are invaluable, but then the vegetable element is lost, having fled in the smoke of the fire.

As *fodder*, well washed, it is said to be excellent. Is it not what the grass-cutters of India provide for their pig-sticking master's Arab? But the question is whether, having the prejudices of the farm-servant to overcome, it would not be unsafe policy, as of course *he* would take care that it was no saving, as regards the supply of corn and roots and hay; and besides, he would throw out, as rejected by his team, a quantity to vegetate and hold on its mischievous life on the manure-heap behind the stables, thence to return duly to its former haunt.

Then a good plan is it, again, to pack up tight the mass, with a dressing of lime between each layer, to make it a compost for the meadow, that will bring up the young white-clover leaflets thickly for the nibbling of the lambs when the ewes' milk shall begin to wane. But of all these plans, “which be the best?” as a rustic hereabouts would inquire.

Black-a-day! what should one do? To decide—is it not the most disagreeable necessity of every-day life? Oh! that some one would say, Do this, or that; then, having attended to orders, one could comfortably repose; and is not my bailiffs in the right when he says, as he often does, compassionately, “Please, sir, I wouldn't be you for anything. When my work's over my mind is free, and I can go and have a pipe upon the stile; but your work is always going on, and your mind is never free!”

But from another point of view, the exceeding dryness of the past summer has been very trying to the temper of the cattle-breeder. Whether from this cause, as is likely, or not, anyhow the cows don't hold, especially if they be at all obese. They should be cool enough, in all conscience, for they have stood for months, half the day, knee-deep in the waters of a swift and limpid river; but somehow they don't hold. Every three weeks they return most provokingly to bull, and that to different bulls. I see that Mr. Tanner notices the occasional occurrence of this sad fact, and attributes it, in his able essay just published in the *Royal Agricultural Journal*, to the extraordinary heat. Whatever the cause, anyhow it is a great sell, especially to those who own Shorthorns of price. What with the wife grumbling incessantly about the want of cream, and the certain loss of interest on capital invested, arising from this barrenness, it is really no joke. I have at this moment three bulls in my stalls, and about a score of buxom cows upon the pasture, not one of

hi ch do we know certainly to be in-calf.

Writing of cattle brings up a pretty picture of home-

stead enjoyment that I saw, not long since, in my farm-yard. Upon one of the last brooding days, just under the lee of the cider-mill, in a sort of moat, that I keep full in case of fire in the stackyard, there stood, calmly chewing her cud, and just flicking the flies off reflectively from her flank with her tail, an aged white cow, that once, under the training of Culshaw, wrought wonders at the Paris and Salisbury Shows. Swimming around and about her, steering handily on their pivots as a gumbot or the Alabama, were some dear domesticated pet wild ducks, popping up and catching the flies from the cow's white-skin, and almost before they settled there nipping them off, to her evident relief and their own private satisfaction. It was a delightful contrast for the contemplation of the indolent. The placid, white old cow in the red-marl-stained water, with the feathered fleet of quackers cruising happily around, and doing her kind service, while they fed themselves, and helped to diminish the plague that is quite besetting this district at present.

This fly abomination! Can it be that the hatches intended for next year are being already quickened by the unusual heat, just as we read of the young crocodiles bursting through the crust of hardened mud under Mungo Park's bed in the desert, having had their egg-covering prematurely chipped by that worthy's weight or warmth.

How devoutly do I not hope that it is so! Then deliverance for the muslin curtain and the whitened ceiling which are now so cruelly bespattered and destroyed! Then good riddance of the villain swarm that gathers in the beer-tap and does its best to be swallowed in a dozen household shapes!

But to return to ducks and their effect upon the meat question. How thankful am I not that I took such pains early in the spring to see that the greatest possible multitude should be reared from our hens and ducks! Have we not such an array of the last—such an array of the former, that our neighbouring friends, with watering teeth, will wonder how ever we can consume them? and do they not come in convenient now, to ease the butcher's bill? and don't they help to swell the farm profits by being content to fatten on the trough of steamed decaying potatoes, just thickened with a pinch of barley-meal? It is worth while hearing how we saved so many. The plan is at once so simple and effective. It was thus: We let the old ducks make their nests where they would, under the heaps of firewood and hedge-clippings that we had carted and thrown down along the edge of the pool, purposely at once to serve as fodder for the oven and to supply shelter from the fox—both two and four-legged—to the brooding ducks. Of a sudden there were several missing at their morning and their evening feed. Anon, one would appear at odd hours, but with so earnest, bustling a demeanour that one had not the heart to scold them for their want of punctuality. And it paid us for our charitable intention in giving them an extra-ordinary meal, when one morning, passing by the pool, our attention was caught by the plaintive wailing of a duckling, as though in distress. We stop to listen and look: when we notice he has dropped from the bank above, as his brother just drops in our view, and sets up at once an involuntary wailing, as though, human-babe-like, he appreciated not as he should his sudden morning wash. Gradually the lot drop out, and at last the fond parent herself flies down with a splash, having for a while most faithfully devoted herself to the hatching of her due complement of eggs, regardless of her infants' cries below, until at length she makes up her mind to follow, despairing of the vitality of the one surviving egg.

Parenthetically, we would observe that all sorts of fowl

invariably hatch a larger per-centage when they are allowed to make their own nests than when they are set by the henwife.

But to return to our duck: just as she proudly sails by through a strait, beside which we are in ambush, with her merry, dark young brood in tow, that are veering around so sharp and jumping at the flies, just then we slip under the landing-net and whip out a pair; then three, and a fourth, and six more, and there is a grand piping in chorus of distressed and affrighted duck juvenility in the covered basket; and then, alas for the feelings of maternity! the whole new brood being walked off briskly to the old henwife's charge, our parent duck but takes a header in the dark flood, and flirts her tail and washes, and feels, no doubt, delightfully her change from incubation to her cool native element, and away she sails down the water-side, so enjoyingly drinking up her beakers, if we may use the expression, until her lord and master observing her, there is a chase and a flight, and they are lost to sight; all ending, however, in her, within a few days, refeathering a nest, and depositing new eggs, and commencing a new term of earnest reproduction. Whereas, meanwhile we, the hard-hearted ones, bear off our wailing freight, finally to turn them out into a wire-fenced, covered court, where there is an old duck hissing at us over her already almost overgrown charge, which, with this new accession, now numbers forty-odd ducklings. All these, however, during the day she proudly and efficiently attends to, instructing them to paddle in the milk-pail that just floats with an inch of water upon a sod of grass, as well as the due use of their chop-sticks in the trough of mashed meal and potato. But at night this will not do: they die then by dozens, if neglected, from want of warmth, the old duck obviously being unable to shelter well above a dozen or so. The duty of the poultry-woman is to catch all the others, and stow them away in the back-kitchen in a hamper or covered basket in some wool, under which is placed a hot bottle. They are thus in the morning bright and fresh, to rejoin their indefatigable mamma. We have lost but few since we adopted this system.

I have just been shown another greatly improved grass mower. Of machinery I am very fond; and once again, as so often before, is suggested to my mind the inquiry, why won't the machine-makers take fair pains, and improve their implements to the utmost *before they bring them out*?

For their own sakes it were advisable. Not only would their sale be vastly increased, but the farmer would have some comfort in buying. I have of late, as many others that I know, become wary of sinking my money in useless or improveable implements. I have had two mowers and two reaping machines on a small holding, and they were all comparative failures. The defects we soon perceived, but could not remedy. Why could not the makers have fairly tested their model, and, on finding that in work the grass clogged in front, have improved the machinery at once? It were undoubtedly their interest to do so. I have mentioned the mower, but my remarks must be understood to apply to all other new implements. Farmers get disgusted, and afraid to purchase. It reminds one of an auctioneer of ponies, the other day. "This is the most perfect cob of the lot"; and when this was sold at a good figure, out came the partner, and from the lips of the oracle, to our astonishment, "Now, here is a better." There were a number of his audience who lost confidence in his statements in a moment. I have spoken more than once to implement-makers and their agents upon the subject; but the only answer one gets is, "If you only knew the expense and trouble we go to in perfecting our machine, you would not wonder or complain." That, excuse me, is nothing to the point. There should be no gross de-

feet left when you offer it for sale. If an implement be fairly tried in the service for which it is intended—grass-cutting, reaping, and so on—defects that will disgust and dishearten the farmer would be at once apparent and remedied; after which the sale at a fair price of a really efficient, simple implement to facilitate labour would surpass calculation. The gross inefficiency of so much machinery when first brought out is the great reason why men decline to invest therein. There is always a very general prejudice against a new implement, and the least defect

consequently gets highly exaggerated. Let the inventor and improver take this to mind: "Don't attempt to introduce until you have perfected and simplified"; and he would be surprised at the difference of the haul that would follow.

But I don't like complaining, and, hush! there's the music of the merry beagles across the water; and as I run to the window, there my friend pops so cleverly over the quickset on his cob! and is waving his cap, that I must be off, to show our bantlings the fun. VIGIL.

THE DUKE OF ARGYLL ON STOCK-BREEDING.

On the 14th of October the Duke of Argyll entertained the landward tenantry on the Inverary estate at the Castle at Inverary. The noble Duke presided on the occasion, the Marquis of Lorn occupying the chair at the lower end of the table.

His Grace proposed the usual loyal and patriotic toasts, after which he proceeded to give "The Tenantry of Scotland." He said: I am glad to congratulate you as representing at least a large class of the farmers of Scotland, namely, the stock farmers—the farmers chiefly interested in the breeding of cattle and sheep. I think I may congratulate you on a period of long-continued and increasing prosperity. So far as my conversation with the tenantry of this country enables me to judge, I must say that they are accepting that prosperity in a very proper spirit—by no means in a spirit of over-confidence, not being inclined to say, as David is reported to have said in circumstances of great prosperity, "In my prosperity I shall never be moved." On the contrary, I have always found the tenantry doubting whether such extraordinary prosperity could possibly last—whether it was to be expected that such unusual prices as we have been realising for our stock in this country could possibly be a permanent state of things, and rather fearing that, prices having become very extravagant, there might suddenly be some revulsion in the markets of the country. That has been a common fear expressed to me; it has been a fear expressed by my rev. friend beside me, Dr. Smith, who is acquainted with farming as well as more spiritual matters. It may be worth while to inquire a little how far it is likely or is not likely that the prosperity of stock farming is to be permanent, or is only due to temporary causes. There have been undoubtedly some temporary causes which have been affecting the markets of the country during the last few years, and prominent among these, of course, I need hardly say, there has been the late civil war in America, affecting very considerably, perhaps I may say largely, the price of wool, as it has done of all fibrous material in this country. I have no doubt whatever that a considerable part of the very high price which has been ruling for wool in this country during the last few years has been due, in a great measure, to the failure of cotton, and to those results which have followed from the great civil war in America. But, at the same time, we must observe that, although the American war has undoubtedly affected the price of wool, it cannot be said directly to have affected the price of sheep and cattle themselves. Now, it is a remarkable circumstance that for some time the price not merely of wool, but of the animals themselves, has been steadily advancing. There is, of course, another temporary and accidental cause which is affecting the price at the present moment, and that is the panic, if I may so call it—perhaps I ought rather to say the alarm, for it is too just an alarm—which has arisen in respect to the cattle disease. That during the last few months has no doubt further tended to increase the price both of sheep and cattle, and that also is, as we earnestly trust and hope, a temporary cause. But we must observe that, long before there were symptoms of a disease approaching, long before there was any alarm whatever in respect to the rinderpest, there had been a steady and rapid rise in the price of cattle and sheep going on for some years, and reaching a very high point during some months previous to the appearance of the cattle disease. We cannot attribute, therefore, either to the American war or to the cattle disease the gradual tendency to a rise

of prices in the markets for sheep and cattle in this country. To what, then, are we to attribute this steady rise in the price of the commodities which you are chiefly concerned in producing? I imagine there can be but one answer to that question—the enormous increase in the consuming power of this country. And here, again, although we may have had cause almost to feel ashamed that we should profit by the calamities of our neighbours, we come to see that our interests are coincident with the interests of all the rest of the world, because the increased power of consumption in this country is due to the enormous increase of its trade, and the enormous increase of its trade is intimately connected and bound up with the peace and prosperity of all other nations in the world. I have no doubt whatever, therefore, that so long as trade is left entirely free, as it now is in most of its branches, and so long as the capital of the country continues to be invested in the production of the goods which are necessary for consumption all over the world, and so long as peace and prosperity open to us the markets of the rest of the world, the consuming power of this country will and must go on increasing. It reaches almost all classes. No one can have failed to observe that during the last few years the labouring classes of this country have been able to consume, and have been actually consuming, much more butcher-meat than they ever have done in any previous period of our history. That is advancing rapidly. Generally among the labouring classes of society people have been earning better wages; they have been able to buy for themselves better food; and that is the real secret of the enormous increase in the price of the articles in question. So far as we know, there has been no diminution in the supply; but there has been an enormous increase in the consuming power of the country. The question of price is not merely, of course, a question of demand; it is a question also of supply—it is a question of the proportion between the demand and the supply with which it is possible to meet it. Now, with a view to the inquiry how far high, or at least remunerative, prices are likely to be permanent for stock in this country, the next question is, Given this enormously increasing demand, what are the sources of supply to which we must look? There can be no doubt whatever that, as regards corn crops, the effect of free trade has been to render unprofitable the cultivation of corn in many districts where it was profitable before; but, as regards stock, I really believe that the farmers of this country need fear no competition which can possibly be brought against them. We are unable of course to foresee what may be the inventions of mankind under the impulse of necessity; and it is just possible, quite possible perhaps, that methods may be found of so far preserving the immense number of animals which are annually slaughtered in South America, for example, almost solely for the sake of their skins, sinews, and fat—it is possible that there, and also in Australia, some method may be found to so preserve the meat as to enable importers to carry it into this country in a fit state for the consumption of the people. You are aware that experiments have been made on this subject, and that a considerable amount of public interest has arisen very lately in respect of what is called the charqui beef, or the beef of South America. I dare say much of it may be found fit for human food; but I cannot bring myself to believe that from this source there ever can be an effective competition against the flesh meat of our own markets. Then let us look on the other side of the water to the continent of Europe,

which is much more likely to supply us with fresh meat in competition with the stock produced here. There is already, as you are aware, a very large importation both of cattle and of sheep from the continent—an importation which no doubt will increase, stimulated and encouraged as it is by the very high prices now ruling in this country. But there are limits, I believe, to that supply, which make it, I think, quite impossible that that can ever bring down to an inconvenient degree the price of meat in this country. The truth is that we, in the British islands, enjoy advantages, as compared with other countries, in the production of stock, which are as great as the disadvantages under which we labour in respect of cereal crops. It is impossible to go over any part of the continent of Europe without being struck by the contrast which is presented between their parched and burnt-up grass in the summer, and the green, succulent vegetation of the British islands. And a great part of Europe, as you all know, is subjected to a very long and severe winter. There is a very small part of Europe which has anything approaching to the openness of the winters of the British islands. In short, the northern part of the continent is sealed up during the winter with snow, while another part in summer is burnt up by heat; and there is only a very small part—chiefly the northern portions of Holland, Belgium, and those countries of Schleswig-Holstein which have been so politically interesting during the last two or three years—which can be looked to for a great supply of butcher-meat for the people of this country. Now, whatever advantages are enjoyed by the British islands as a whole, as compared with the continent, are specially enjoyed by the West Highlands, as compared with all other parts of the country. We have a very moist climate, and we have what may be called perennial grass. We have a very mild winter. I have often been here in winter,

and I think I may safely say that the years are rare in which we have six weeks of snow lying on the low ground of this country. No doubt on the tops of the hills there is snow lying a considerable part of the winter; but the lower slopes of the hills and all the low ground are, during a great part of the winter and spring, entirely free from snow. Now this is an advantage enjoyed by very few parts of the country indeed. Even as compared with England, whenever we have a hot and dry season—and the last two years have been extraordinarily hot and dry seasons in England—I never come to this country from England, as I generally do in July or August, without seeing with ever fresh astonishment the greenness and richness of our pastures. They always remind me of the expression of the Psalmist, "Thy paths drop fatness; they drop upon the pastures." It is extraordinary the richness of the pastures in this country in a dry season, as compared with that on the continent, and even in England. While a great part of the pastures of England are extremely burnt up, I do not think there has been any drought in this country which could be at all injurious to the pasture. The hills were extremely rich in grass; the hay crops were very admirable, although not so abundant as in some years; and turnips, a failure over a great part of the country, seemed to me rich and luxuriant in the lower part of this country. In short, as regards the production of sheep and cattle, there is no doubt whatever that in this moist climate of the west coast of Scotland you enjoy advantages such as are enjoyed by a very small portion of the world indeed; therefore I say that, as far as regards the question of supply for this rapidly increasing demand for butcher-meat, I think you have advantages which, if they are well husbanded, will enable you to compete with any possible production which can be brought against you.

THE DWELLINGS OF PIGS AND PEASANTS.

At the annual meeting of the Halberton Farmers' Club, a day or two since, the Rev. Canon Girdlestone, the vicar of Halberton, made a speech, in which he spoke of the value of such clubs, the improvement of cottages, the cattle murrain, and other kindred topics. He said one special subject which deeply interested himself, but had not attracted the remarks of any previous speaker, in some measure concerned the owners, and in another measure the occupiers, of land. There was no doubt that each had a share of the responsibility. It was a very important subject—he meant that relating to the dwellings of the labourers in the agricultural districts. He was enough of a farmer to know that if he wanted to have his horse in good condition he must give him a good stable, and in his stable place a good stall. He must have the stable well drained and well ventilated, and made snug and comfortable. He was enough of a farmer to know that the same treatment must be adopted, more or less, according to circumstances, with other classes of animals. The squire of the parish he held for many years in Lancashire, a man of old family, was an amateur farmer, and he bestowed his attention especially upon pigs. The pigs had not sties to live in; they had positive palaces, actually had a green park to run in, and were washed with soap and water two or three times a week. What was the result? Why the animals that were considered to prefer dirty habits became more clean in them, and grew so fine that the squire won prizes at almost every agricultural show in the county, and made large sums of money by his pigs. He was sure they would agree with him on the general principle, which they saw developed in every part of the country, that in order to have first-class animals they must give them first-class accommodation and a large portion of attention and care. Now, whilst they were all alive to that part of the question—and he did not believe there was a farmer present who would say nay to the principles he had laid down, as to the care that was taken of their cattle—he would ask them what was the condition of the agricultural labourer? He would ask them to compare many of the labourers' cottages with the stalls in which they stabled their

horses, the sheds in which they cared for their cattle, or even the sties where they housed their pigs. He had no hesitation in saying that in a great number of instances the brute creation had the preference over human beings. They might say what was that to them? the cattle were of importance to them, and if they did not bring them up carefully they would lose their profits. He, however, maintained that the housing of the labourer did matter a great deal to them in every respect. They could not expect to have a faithful, honest, intelligent servant unless he was well cared for, at least as well as the cattle on whom so much attention was bestowed. He took it that in many cases they could see the houses almost in ruins, with the roof like an umbrella which let in more rain than it kept out, with the floor so full of holes that the tidiest housewife could not possibly keep it clean; a single room, in which there were sleeping together father, mother, and grown-up sons and daughters. He asked them what they could expect to be the result of that. It was not strange that their labourers frequently preferred the fireside of the public-house to their own, because their own was so uncomfortable. Many of their young women became mothers before they were wives, and had a herd of illegitimate children following them about, who had to be provided for at the cost of the parish. They must not be surprised at such results, for they were the necessary consequences of such a state of things. These matters were of great pecuniary interest to themselves, because it would increase the amount of their rates, which every farmer in the parish was constantly telling him was the only thing that stood in the way of improving their farms. But there was a much more important principle than that involved, for it must be remembered that there was a place where they had to give account for the moral and religious treatment of every single soul with whom they were brought into contact as masters. The present was an age of progress, and progress must be stamped on the very future of such societies as the present, and they might depend upon it that if they wished that parish to prosper they must progress also.

STEPPE MURRAIN—ITS NATURE, PREVENTION, AND CURE.

Cattle are subject to four maladies known under the popular name of "murrain," viz.:

1. Vesicular murrain, or mouth-and-foot disease.
2. Pulmonary murrain, or lung disease.
3. Steppe murrain, or contagious fever in cattle.
4. Carbuncular murrain, malignant pustule, or Siberian cattle plague.

Of these several varieties of murrain, the 3rd—steppe murrain—is the subject of this paper.

Very little is yet known, scientifically speaking, of steppe murrain. A long experience has enabled political and agricultural writers, veterinarians, and medical men to talk fluently of certain outward appearances, and also of what they have seen and done. But the greater portion of this talk is unworthy of the appellation of science, strictly speaking; for many discoveries have yet to be made before the true character of steppe murrain is understood. Indeed no small part of medical science (in the common acceptance of the phrase), as applied both to man and our domestic animals, belongs to the same superficial view that is thus taken of this disease; and the reason is simply because Experience has hitherto been the master teacher. When left to themselves, instinct teaches our cattle, when ailing, to eat certain medicinal plants in their pastures, in order to effect a cure. And in the olden time medical men were not ashamed to follow the cattle thus grazing, in order to ascertain the medicinal properties of the plants in question, and then by experiment on themselves and their patients to follow up the most successful method of compounding and exhibiting such medicines. Up to a very recent period, an experimental knowledge of this kind was all that constituted medical science.

Of late years chemistry and the microscope have done much to throw scientific light upon the subject; but much more remains to be done before we know the medicinal properties of even our daily food—properties that are essentially necessary to preserve us in health. And with regard to the food of our cattle, our chemical knowledge in this respect is still farther behind. As to the malady under consideration—steppe murrain—we neither know its chemistry nor the chemistry of its prevention or cure, no remedial means having been discovered up to this date by experiment as above.

From these observations it will readily be inferred that our remarks on the nature, prevention, and cure of the contagious maladies that are now decimating our herds and flocks—and even ourselves, for two veterinarians have been cut off—must have for their object the reconciling of facts so far as discovery in veterinary science has already attained in the knowledge of this class of diseases, and the stimulating of further discovery so as to obviate the ruinously heavy losses now being sustained by the owners of diseased cattle.

First, as to the nature of the disease. The almost unanimous opinion of the veterinary profession and also of medical men both of this country and of the Continent of Europe is that it is the Russian "Steppe murrain," *alias* cattle plague, *alias*, in German, "rinderpest," which has been imported by some means or other from those provinces of the Continent where it is now raging. And, although this opinion has met with much opposition, the counter-arguments thus raised fall to the ground as untenable, being nothing more than the baseless fabric of a sceptical vision.

Of the untenable objections raised to the above professional opinion, the following may be instanced and briefly disposed of in this place:—

1. "The importation of steppe-murrain from the infected provinces of the Continent has not been established, and therefore it is not the disease." But the fallacy of this objection is so manifest as hardly to admit of a refutation; for those who thus reason the matter may as well argue that because the Ethnological Society cannot prove how a Cossack of the Don got to the British capital, he must therefore be an Englishman! In short, if the disease is Russian steppe-murrain, then it cannot be English murrain, and *vice versa*. And, with regard to the introduction of the former into this

country, it may have been imported in some one or other of the different kinds of corn and seeds, in wool, hides, tallow, and other imports of this kind from the infected countries; or it may have been imported in flax, or some other fibrous material, or in the wearing apparel of travellers, or of those engaged in commerce, or in manufactured goods, &c. When these several sources are practically investigated, the surprise will be that England has been so long in catching contagion from the Continent.

2. The second objection raised is, that "London and other large town dairies, cattle markets, and lairs, &c., are in such a filthy, over-crowded, pestilential state as to be capable of generating disease of a typhoid nature, and therefore the cattle plague now raging is in all probability of English and not Russian origin." We have for upwards of twenty years advocated strongly the general doctrine involved in this objection, as to the generation of disease at home, and to an increasing liability to the growth and spread of malignant contagious diseases. The concentration of cattle in the metropolis, also the concentration of the offal of slaughtered cattle, and the concentration of sewage gases in the capital, is a pestilential state of things enough to alarm the most obtuse observer; but granting this, and a great deal more in the same direction, the facts of the two cases in question are so totally different in London and in the steppes of Russia, both as regards cattle, climate, and produce, so that London miasms and steppe miasms and the typhoid diseases which they produce in cattle constitutionally different are also different, so that the existence of English typhus does not improve the existence of Russian typhus (granting that steppe murrain is typhus), any more than the existence of malignant cases of British cholera improves the existence of Asiatic cholera. Hence the nature of the fallacy of the objection. In short, there is a much greater variety of typhus in cattle, as in man, than those who raise this untenable objection imagine. True, there is the possibility of the veterinary and medical authorities, referred to above, having mistaken the Russian plague for the English plague; but the hypothesis is a very unlikely and uncharitable one, and unwarranted by any facts which have come under our notice, for the pathological peculiarities of steppe murrain have been too well identified to be mistaken. At the same time, it must be admitted that the above authorities, and still more so the long list of Government inspectors, have manifested a somewhat conspicuous proneness to follow in the footsteps of the past, blind to those differences of circumstances which give variety to contagious diseases. But it is to be hoped that the breaking out of murrain amongst sheep, horses, and all kinds of stock will induce them for the future to examine diseased animals more closely through English spectacles; for if they do so they may ultimately find some half-a-dozen of varieties, or more, of English typhus in each of our domestic animals, as something of this sort is absolutely necessary to reconcile the diversity of cases now recorded with one another, and with any established laws of nature.

3. The third objection is not a very definite one, but it runs somehow thus: "The contagion is in the air, and that blows the philosophy of our veterinarians and medical men to the winds." When people leave *terra firma* for the clouds, it is seldom worth while to follow them. This method of battling the question belongs to the olden time; and before our ancestors had discovered the constituent elements of the atmosphere and its physical properties generally, it was doubtless admissible; but the modern lesson thus taught by the facts of the case simply inform us that the contagious matter, whatever it may be, is lighter or of less specific gravity than the atmosphere. And the information thus taught is of the highest importance, as it obviously furnishes one line of investigation for determining what the generating miasms and the contagious fomites of steppe murrain and the other varieties of cattle fevers are, in a chemico-physiological sense, assuming that steppe murrain is a contagious fever; for if this could be ascertained, preventive and curative discoveries would follow.

Further refutation of this old aerial dogma would be superfluous. The distance to which contagious matter can be carried in the atmosphere has not been determined. The example of Lord Syney's stock, viz., "three miles," although often quoted, will not bear a close investigation, for the contagious matter may have been carried this distance by dogs, foxes, hares, and rabbits—by rats, cats, weasels, and vermin of this class: by flies, or by various kinds of birds, as carrion crows, magpies, &c.; or the saliva of diseased cattle may have been carried this distance on the surface of a flowing stream or river, as from one drinking-pool to another. The ways by which contagion may be conveyed from one place to another are far more numerous than credited at the present time, and it would be well for the owners of cattle to make themselves better acquainted with the practical details of this view of the subject than they now appear to be; for the manner cattle have been purchased in open markets since the prevalence of cattle-plague was known, shows either a degree of ignorance or of supine indifference that is highly discreditably to both buyer and seller.

Some doubts may be raised as to whether steppe-murrain is truly a case of simple typhus; but until science makes farther discovery as to what typhus in cattle really is, and we may also include the question of what typhus in man is, so as to distinguish scientifically its different varieties, it would be premature to offer a word of comment on this head of the subject.

The period of "incubation," as it has been termed, is another question that is giving rise to much fallacy. The propriety of the term itself as applied to a putrid disease is a very problematical one; for it ignores the chemical changes that manifestly take place in the putrefaction of animal substances, and the new products formed under such processes in animal chemistry; while it solves the problem at issue and all similar problems physiologically, the living organism of the ox or sheep being metamorphosed (we use the expression for the want of a better) either into cryptogamic organisms so small as to be invisible to the naked eye, and of so low a specific gravity as to float in the atmosphere, or else into some sort of vibronic animal life, or *living stink*, so to speak, into which the body of the animal is finally resolved, and of which perhaps the less said the better, in our present state of knowledge; for when chemistry and physiology have made the discovery, thereby determining what respectively belongs to each, then we shall know the ultimatum of the matter. Meantime farmers have to deal with the contagious matter as an unknown poison, which if taken into the system is assumed not to play havoc for some ten days or so! Now, practically speaking, perhaps greater nonsense was never promulgated; for the contagious fomes begin to exercise their forces, whether those forces be vital or chemical, the moment they are taken into the circulation, assuming they are in an active state: if in a passive state, they will pass through the system harmless, if they are not changed in the digestive processes. In either case Nature will do her best to defend herself. If the health is low and predisposed to harm, *i. e.*, if the tissues and fluids are in an abnormal state, and exercise a strong affinity, or an attractive force, as the case may be, for the contagion, she will soon succumb under the former hypothesis. But if health is robust, and the fluids well supplied with those antiseptic, tonic, and other properties that exercise a repulsive force, the contagion will be powerless, so long as the system is kept in this robust state of health. On the other hand, if the contagious matter is deposited upon the coats of cattle, as in the hair of the ox, or the wool of the sheep, in an agglutinate form, as in the saliva or feces of the diseased animal, it may be there for weeks, and even months, and at the expiration of these periods be taken into the system of an animal predisposed to disease, in various ways—as by the contagion being liberated into the atmosphere, and thus be taken into the lungs; or it may be washed off with rain, or rubbed off, and mixed with the food, and thus be taken into the stomach; or it may be licked off with the tongue. Such being the facts of the case so far as known, the reader will perceive the difficulties that stand in the way of preventing the spread of disease by any system of quarantine.

The slaughtering and burying of infected cattle, or the "stamping-out process" as it has been termed, is another very unpopular method of preventing the spread of disease. The question involved is chiefly one of expediency, so that the facts

of the case must be the rule in each example. Personally, we feel a strong aversion to "the stamping-out process" rule; but until a remedy is discovered, the disease must be treated as an incurable one. In a few instances nature may fight the battle successfully, thus restoring a small per-centage of the herd or flock to comparative health; but in this example three considerations have to be estimated before a practical conclusion can be drawn. First, the reduced value of the recovered animals, present and future. If a fat ox or milch cow is worth £20 when infected—£10 when cured—and if after this it does not return one-half the value of the food it consumes, then the owner and the public may both sustain a dead loss. Second, if fifty per cent. of the stock die, then three-fourths of the value of the herd is the present loss. Third, if five animals had been infected at the outset, and if slaughtering these would have saved the remainder, then the owner's loss would have only been £100. Hence the practical conclusion. But the *if* in this example hinges upon a very nice professional question, which we believe has not yet been solved by veterinarians or medical men, viz., If the infected animals are slaughtered before they begin to give off contagious fomes, then the disease will be effectually "stamped out." *Query*, at what period of the disease does the discharge of contagion begin? The primary generating miasm is not contagion in every case, and therefore when the former is taken into the system it requires a certain time to play havoc and produce the latter: how long? Again, there is a period of time between the ingress and egress of contagious matter: what is the length of this period? To neither of these two questions can a definite answer be given; but it may safely be inferred that the periods of time are very different under different circumstances as to the nature of the primary generating miasm—the temperature and purity of the atmosphere, and the constitutional health, food, and physical condition of the animal when infected.

Public opinion in the discussion of the stamping-out practice has fallen into an egregious error, by assuming that the slaughtering of diseased cattle involves a loss of animal food, the reverse of this short-sighted and fallacious conclusion being the truth. Thus, for example, the food of the animals which they consume after they are recovered is, in point of fact, that which represents the animal food of the people, and not the carcases of the animals when infected; for the cattle plague is unquestionably a great gormandiser of flesh and milk. And this, too, is not the most unfavourable view of the subject; for after animals have recovered, they do not pay for the food they consume, *i. e.*, they turn their food to bad account, while the quality of the meat or milk they yield is inferior. Add these considerations together, and the nature of the fallacy will appear manifest.

If, on the other hand, the disease is in an advanced state, and if the atmosphere is in a highly putrid and pestilential state from the discharge of contagion, and if the pestilence extends far and wide, then the slaughtering practice becomes more and more difficult to be carried out successfully, as other herds and flocks are liable to become infected.

Until a cure has been discovered (and even when it is) every attention should be paid to preventive means, and to prohibiting the selling of calves and lambs, so as to supply stock for the conversion of farm produce into animal food for the future; but into the details of this we cannot go at present.

A FIRST-PRIZE STOCK BREEDER.

REMEDY FOR CRACKED HOOFS.—Take a piece of copper four inches long and two inches wide, and drill eight holes, four in each end, so as not to interfere with the crack, and screw it fast to the hoof, crossways of the crack; then take a hot iron with a sharp edge, and burn the crack at the edge of the hair, till it goes through to the quick. After this let the horse run on pasture, and it will begin to heal up in a few weeks. This remedy I have tried, and it did the work complete, and I worked the horse all the time. Care should be taken to close the crack tight before the plate is fastened on. So says a practical farmer of Pleasant Valley, Ohio, in *Country Gentleman*.

THE PIG.

(Concluded from our last.)

The animals of this variety of swine afford the best symmetry that can be seen of the pig carcase. The greatest degree of activity belongs to it that is exercised by domesticated swine, and it very much conduces to the health of the animal and the soundness of the flesh. The widening of the carcase has lightened the belly, and strengthened the legs, and thus have been removed the very general objections to heavy swine, the want of some degree of activity and of a sufficient leg. These qualities are possessed by the variety now described, as fully as may be consistent with the very glutinous and obese propensity of the hog genus of animals.

The improved pig of Berkshire is the most faultless of all British swine, none being more generally useful, or possessing so many points of excellence. The size is the smallest medium bulk; colour black, with white spots on the belly and flanks, with a tawny red tinge on the same places. This variety of colours shows a mixed descent from the pig of Naples and China, and the old and indigenous hog, with the tawny flanks and snout. No other pig possesses the general parts of the body in the same proportions of just adaptation on the same level distribution of fat and lean flesh over the carcase. This is a valuable distinction in producing an agreeable diet of animal food. The animal is most peculiarly the labourers' pig; convenient in size, easily maintained, flesh well mixed, and spread over the body; quick in fattening, and cheaply replaced. For small farmers, this recommendation is also to be applied.

The small breed of pigs has been obtained by crossing the least sized variety of the English improved hog with the swine of China. The delicacy of flesh has been imparted by the foreign swine, both by the Chinese and Neapolitan animals, as warm countries only produce pigs of that perfection. These animals were early imported into Britain, and the value was soon observed and appreciated. A continued use of the animals has stamped a variety of pigs in Britain known by the name of the small breed.

This variety of swine is mostly white in colour, as both the English hog and Chinese pig are nearly white. The delicacy is very great, that quality of the Chinese breed having been very largely communicated to the improved progeny of the mixed blood. The size is small, and the bulk diminutive; but the number of animals that can be maintained and fattened on a certain quantity of food, makes compensation for the want of size in the carcase, and for the weight of production. The great use of the breed consists in attending the young pigs for roasting, the quantity of flesh on the same bulk very far exceeds any other animal form. The most delicious fresh pork is also afforded by the small breed of swine; not only the delicacy of flesh suits that purpose, but the size and form of the animal join in constituting a most eligible article for the tables of the rich, and the secondary degree of domestic economy. For bacon and hams the use is small; the size is below that condition of being prepared, and the flesh is weak to be salted. The largest carcasses of the small swine are sometimes prepared for future use; but the common purpose is for fresh pork and roast pigs, in which capacity the breed is most admirably adapted. The breeding is mostly confined to the establishments of gentlemen farmers, who relish the fine articles in preference to value and profit. The breeding from near affinities has reduced this variety of swine to a very delicate existence—the hair or bristles has nearly altogether disappeared, and has been succeeded by a scrofulous skin, and a redness beyond the natural condition. This state is deficient in the constitutional vigour that is necessary to discharge the animal functions. The pigs of the small breed are exhibited in a very superior excellence on the Royal farms at Windsor, wholly white in colour, and of the large size of the breed, not reduced into delicacy, nor dwindled into insignificance of bulk. For fresh pork and roast pigs the animals are most superior, and afford small hams of much preference. A vigorous con-

stitution is shown, of which the want forms a heavy objection to many refinements of animals.

The three kinds of pigs that have been described, comprehend the whole classes that are used in Britain, and every modification of the animals can be easily referred to some of the kinds now mentioned. The quality of the flesh is an inseparable attendant of the animal condition in a large, a middling, or a small bulk of carcase. No other animal of the farm inherits so very pertinaciously this property, though it belongs in a greater or less degree to every animal existence. A near consanguinity of breeding very soon diminishes the value of the pig; the size is dwindled, and the constitution is enfeebled, the flesh loses quality, and the vigour is wanting which upholds the system, and enables the proper discharge of the natural functions. This invaluable quality must be possessed by all thriving states of animal life. An activity is also required, and a disposition to move about in some degree less or more. Some exercise promotes a healthy circulation, and assists assimilation and digestion. Though short and fine in the bone, the legs of swine must be sufficient to support the carcase; the head must be small rather than large, but not disproportionately reduced, as in some kinds of small pigs, the back straight and wide; the skin thick, fine, and gelatinous; coat glossy, with no eruptions on the hide; hair or bristles rather thinly placed on the body, long, and fine to the touch, not coarse and harsh; neck short and thick, a great mark of the fattening propensity in all animals; cheeks full; body deep, compact, full and plump; ears erect, quick, pointed upwards, and not slouching forwards. Width of carcase is the chief essential of a pig; and breadth of loin and breast, a cylindrical squareness of form, with a near uniformity of size, and an abundant propagation. A refined delicacy loses the robust properties which constitute a prosperous existence: to combine the conjunction of the double inheritance is the grand object of all profitable breeding.

The most eligible production of improved swine in Britain may be found among the animals of the white colour of the middle-sized breed, with a good coat of hair in bristles, of a fair length and quality, and fine in the pile. Black pigs are finest in the skin, are less subject to diseases of the coat than white colours, and are less affected by the rays of the sun; but the white skin is most pleasing to the eye in all flesh that is used with the skin unremoved, as with swine and poultry; but this objection does not much prevail. The great preference of the middle-sized breed consists in affording roasting-pigs and fresh pork in the young condition, and large hams and bacon in the matured age. These purposes being duly served, affix a value that requires no further demonstration.

The very large consumption of the flesh of swine as an article of human food, in the fresh and salted condition for the domestic use, and in the latter state as an article of exportation, and for naval stores, attaches a very great importance to the breeding and management of pigs over the United Kingdom of the British isles. Every quantity of land in the hired cultivation of the extent of 200 acres and upwards, of which a fair portion is capable of producing crops of roots for winter food, should be arranged to constitute a regular manufactory of prepared articles of sale, breeding, and fattening the number or animals that can be maintained on the extent of ground. Among the animals that are thus entered into the use of the farm, the pig holds a place that is equal to any other of the articles that are manufactured into value. The accommodation given to swine must be adequate to serve the purpose of separation, rearing, and fattening: the houses are low to suit the stature of the animals, and the yards are less extensive than for cattle. The systematic arrangement of managing animals requires that each kind be separately accommodated, and the low bulk of swine demands this removal more than the larger animals of the farm, but which are treated with separation. In the management that is now to be detailed, the piggery is wholly separated from the far-

mery, but still adjoining to it, and forming a part of the erection.

A small piggery is required to suit the small extent of farms, accommodating one or two sows for breeding and the offspring in the store and fattened condition. A house contains the food for application, sties for fattening two animals in each division, a yard for store pigs with sheds for shelter, and a pond of water in which to roll and wallow. The food is meals, wheys, and boiled potatoes in the yard, with clovers and vetches in summer, and roots during winter.

On farms 300 acres and upwards, a boar and three brood sows are accommodated in four sties, placed on the end of the fire-house, and forming with it the width of the piggery; the lodging is in an open yard and a covered shed, being the best accommodation yet devised. The young pigs are nursed by the sows till grown, castrated, and weaned, and then turned into the store yards, fed during summer with clovers and vetches, and in winter with turnips, potatoes, beet, and cabbages, but chiefly with raw potatoes. Ample littering is supplied in the rough straw dung from the stables, which affords a warm bed for the pigs, and will produce a large quantity of dung in the store-yard, which is provided with shelter-sheds against the inclement weather, and a central pond of water in which the pigs delight to roll and wallow. There is a double row of fattening sties for two pigs in each apartment, into which the animals are drawn from the store-yard as required to be fattened. This is done by means of cooked food in steamed potatoes mashed with meals, and prepared in the fire-house, cooked in vats, and carried along the pavement road between the rows of sties in a light four-wheeled iron waggon, and delivered by a spade through the spout-holes into the troughs placed for the pigs in the open yard. Two meals a-day, in the morning and evening, will suffice for short days, long days will require three feedings. Experience has shown that of all farm animals, pigs are most benefited by cooked food; and it is here solely used, except during the last month of feeding. One daily meal is given, in dry grains, of beans, oats, or barley, in order to consolidate the flesh, and bind the muscular frame. Beans are most useful, as the seeds contain the tannin principle in the pericarp, which binds the fibrous bodies into a more firm consistence. The average progeny from three brood-sows may be sixty pigs yearly. Two lots of fat pigs, sold yearly from the sties, will be about fifty. The surplus pigs are sold as lean stores. The fire-house is floored, to contain the meals and grains; the roots and steaming-vats are on the ground-floor. An end-door in the house passes the cooked food, along a pavement road, to the boar and brood-sows, which latter are amply fed during the suckling season with liquid food, as milks and wheys, thickened with meals. Such an establishment as now described will employ part of the time of the cow-maan and lad both during winter and summer. Water is brought to the steaming-house in pipes from some higher position; and meals and roots are in a convenient access. The fattening season begins with the month of October, and ends with March, allowing two fattenings of pigs, as the animals are always in a very forward condition in the store-yard, and ready for the feeding-sty.

It is beneficial to allow some few store pigs of a small size to live in the cattle-feeding yards, and roam at pleasure from place to place, picking up for food the crusts of turnip-bulbs that are refused by the cattle, and the grains that may come among the straw and escaped from the scutchers of the thrashing machine. Some few turnip-roots or raw potatoes being given to these stray inhabitants, will assist the growth, which is much promoted by the nesting of the pigs in the yard adjoining the stable, of which the litter is discharged in a rough condition, with the warm dung of the horse, that is very agreeable to the nature of swine. It will be advantageous that the yard next to the stable is wholly adapted as a store-pig habitation, and provided with the necessary water and troughs for containing the raw kinds of foods. A manure of most excellent quality is thus manufactured; the cold saponaceous excrement of the pig is mixed with the hot fermenting dung of the horse, which corrects the extreme quality of both substances into a medium of a better nature. The labour of swine with the snout is almost incessant, by which the excrementitious substances are minutely reduced and most intimately blended. The manufacture thus done exceeds all hand-mixing of materials. If this yard is not formed adjoining the stable for store swine, the straw dung

of the stable is carried to the store-yard of the specially-designed piggery, as is now represented, and spread as litter evenly and regularly over the surface, when an excellent mixture happens of the hot and cold excrements, which are corrected into a medium quality of a very great value and of a large quantity from the straw afforded as litter. Much of the profit derived from swine arises from the bulk of the most excellent manure that is made by the animals, when duly accommodated and provided with food and litter. No animal of the farm is so useful in that respect, nor does any quadruped void so large a quantity of solid and liquid excrements in proportion of the bulk of carcase. The organs are fitted for quick digestion, which induces a voracious appetite, that is little discriminating; but a general devourer of juicy articles and rejecting dried forage, as the animal does not ruminate. The variety of food consumed by pigs imposes little trouble in the preparation.

Pigs are very multiparous, the gestation of the female being often considerably advanced before the preceding litter is weaned. But the simultaneous processes of breeding and suckling are too severe to be supported by the animal, and the progeny is best restricted to two litters in the year, which gives some recreation between the bearings, as the production is in seventeen weeks after impregnation. A very numerous progeny is not eligible, being often puny and delicate; eight, and not exceeding ten pigs, are the best litter, when the chance is of being strong and healthy. Sixteen pigs from a sow yearly are better than twenty-four, when deaths will be more frequent, and the lives less robust. During the time of suckling, the sow requires a very attentive supply of juicy and liquid food in milks and wheys, thickened with barley-meal; water alone may be used in forming the thickened warm food, and assisted by the liquids of the dairy. On the pigs being weaned, dry food, as oats and beans, are given to the sows for the purpose of promoting the salacity, which is much forwarded by that application. The pigs are allowed for a time very ample food in broths and gruels made with warm milks, wheys, and water, thickened with meals of beans, barley, and oats ground and mixed for the purpose. When parted from the sow, it is beneficial that the pigs are confined in a shed or styes, in order to feed for a time with food similar to the milk of the udder, and have a part of the food of the store-yard to learn the eating of the fare to be used when turned into that congregation. Being thus strengthened by age, and accustomed to the food, the transition will be easy from the sty to the store-yard, and inflicts no damage on the progressive growth of the animals. The fire-house for cooking the food gives much convenience in providing warm meals for the special purposes of the piggery. In small establishments the kitchen of the farm-house will afford those warm provisions, and the piggery is placed at a near distance from the back-door of the kitchen. In that case some vats are placed to receive meals and dairy wash, which become thickened by remaining, and being again made thin with warm liquids, a healthy food is prepared for pigs of all ages. The cooking-house, as seen in the design now shown, supersedes this necessity; but these erections suppose large establishments and a systematic management, both in breeding and feeding the swine. The same rules are to be observed in every case of feeding pigs; the largest establishment is only a greater extent of the smaller practice, varied in some points of application by the more ample means that are afforded, and the number of animals that are to be provided with food and accommodation. These differences cause some deviations, but still attached to the main purpose.

It is acknowledged, almost without a single doubt being expressed, that pigs, before all other animals of the farm, produce the largest quantity of flesh meat from the food that is consumed, and that the pig eats the greatest variety of food which is the least troublesome in the preparation of use. With the exception of dried forage food, as hays and straws, on which articles alone cattle and sheep are not readily fattened, swine devour promiscuously almost every leaf and root, rejecting little, and consuming very largely. In the store condition of the animals, raw food is preferred, as the juice is required to distend the growth in the fattening process; cooked food is required in order that flesh may be easier and more speedily formed. Even in that condition grains are found necessary to impart firmness to the flesh, and bind the fibrous texture of the animal frame. The experience is ample, and is daily

practised, of rearing and fattening swine in much perfection with unprepared roots and grains, and without any confinement of the animals; and as the process of fattening is slower, the flesh is firmer, and more fixed and concentrated. This mode can only be done on a small scale, and with a few of the animals to be bred and fattened; the extensive manufactory of swine demands a separation of the age and purpose of the animals, and the accommodation necessary for the receiving and fattening being done in a separate combination.

The meal of barley fattens pigs better than any other food that is known, the great quantity of starch, about 60 per cent., producing a larger portion of fat in the animal than in any other fattened carcase. The proportion of fat to lean is produced by the pig more largely than by any other animal, and by barley-meal better than by any other food, though it contains very little oily matter, and is superior to oilcake, or any other food of the kind. The pig sleeping in the shed after a full diet of thickened barley-meal in the yard, solves the problem of chemical philosophy on the conversion of starch into fat. But the peculiar organs of the pig are required for the process, as barley does not produce the same result with any other animal.

No fattened animal is so extensively spread in the use as the pig; the ox and the sheep are only kept on extents of cultivated lands, and by the cultivators themselves, whereas the pig enters into every human dwelling, and becomes a part of its furniture. The size of the animal suits the convenience of any habitation; the food, both in quantity and quality, is within the reach of almost the poorest inmates, and the unscrupulous taste of the pig is adapted to the little variety of food that can be afforded, and the limited means of procurement. On small farms the use of swine is very great, being in many cases the chief support of the establishment, especially when near to the demand of towns and naval stations. In these cases, the management is more regular and systematic, though on a small scale, than on more extensive farms, where cattle and sheep are more favoured as fattening stock at least in the fair ratio; the breed is kept, and the progeny reared into forward stores, or fattened into bacon. The demand is found to suit the use of the flesh, and the attention is consequently turned to that article as a manufactory of farm produce. In this way the root crops are advantageously disposed, and the profit is found to be very considerable.

On dairy farms, where the produce is large in milks and wheys, pigs are indispensable consumers of these articles, which no other animals of the farm are adapted to use. Pigs are consequently very extensively reared and fattened under these circumstances. The liquids of the dairy in the thin mixture with meals nurse the young condition into small pork; and the thicker food of meals and milks fatten the animals, with some raw grains to finish the process. A very large quantity of animal food is thus produced, and from articles that, but for pigs, would be altogether lost and thrown away, which consideration very much raises the value of the pig as a domestic animal to be reared and fattened. The variety of its food comes here into a very large consideration.

As the flesh diet of the labouring class of society, pigs are far the most useful of all fattened animals, and not in the cheapness of the flesh, but in the way of its being procured by the poor inhabitant of the cottage. If not a piece of rented land, at least a garden ground is attached to every human dwelling. In thickly-peopled countries of labour on the farm, a quantity of potatoes growing in the farmer's field forms a part of the yearly wages, and also a cow kept on the farm, which belongs to the labourer or the farmer. The vegetable produce of the garden, the potatoes of the field, and the milk of the cow, all produce a food for the pig, and in remnants that could not otherwise be used, but be lost in any application. Accordingly, it is essential that every cottage have accommodation for a pig, in which the animal can live and be fattened, and by the usual arrangement of two in a year, or three in two years. Two small pigs of the middling breed in the year will best suit the poor man's purposes. Equal in use with the milk of the cow to the young family of the labourer, the flesh of the pig may be a more substantial diet to the working part of the people. The offals afford a fresh meat, and are made to last for a time; part can be cured; while the hams and bacon afford a ready, wholesome, and substantial food throughout the year. It is this readiness, and the mode of procuring the meat by the home-fattening of

the pig, that confers the very especial value on the animal for the use of the labouring population. The home production of it, with the articles of the wages of labour, prevent the market purchase of flesh, and affords a recompense that is beyond the value in money. The bulk of the pig is convenient to the purpose of the cottager: the variety of food eaten by the animal suits the means of maintenance; and the quantity of flesh produced from the food consumed is not equalled by any other animal, and no other flesh-producing quadruped relishes the food of the pig, which would be altogether lost but for the swine to consume it. The flesh of the pig is almost the only animal food within the reach of the labouring population. Being manufactured at home, the money is not wanted for the direct purchase—it is ready at all times at home, and carried to the field of labour; and, being generally nutritious, it is never refused by any fastidious liking, or reserved to please any unreasonable choice. The harmony of the hearth and domestic contentment are very much promoted by the ready article of bacon in the cottage of the labourer. The wife is pleased to have a ready meal for all demands; and the husband reckons on a supply that never forsakes his abode. The provision does more to prevent marauding and poaching than whole volumes of penal statutes. The tame animals supply the want of wild ones, and exhibits the social example of competency, preventing crime, or, rather, an usurped prohibition. At all events, the provision of competence is seen to produce the expected results.

The pig is a most general cosmopolite, inhabiting a great variety of climates; and in no locality is the domestication refused by Nature, provided the food in some kind or quality is afforded, and the necessary shelter erected. Cattle and sheep have their peculiar likings, which must be gratified in order to obtain a profitable use of the animals: the kinds of the animals must be adapted to the influences of the climate and the capabilities of the soil, along with the general surrounding circumstances. But the pig does not require any large consideration for its maintenance. The support is easy, and the accommodation inexpensive; and for its general usage no very particular provisions have to be regarded.

No description or notice can be formed of the animals of the farm without a very large and varied estimate being made of swine, as constituting a most important and very considerable portion of the fattened produce of cultivated lands. The offal nature of the food consumed by store pigs, both in the quantity and quality, forms a very great recommendation; while the variety of general aliment is a property of swine that exceeds every other animal, and is almost exclusively confined to the pig. This quality, along with the easy adaptation of the animal to the circumstances of influence, much advance the estimated value of swine. The convenience of its use in small habitations, the quality of the flesh, the quantity produced from the kind of food, and very procreative faculty of the animal have fixed a natural value on the pig, that cannot be challenged, nor can be in the least degree impugned. Practical opinion never exhibits two sides of the question, and every written record bears testimony of the universal entertainment. No fattened animal produces so much flesh from the same quantity and quality of food that is consumed, nor does any other beast carry the amount of meat on the small quantity of bone that forms the carcase of the pig. In these respects the pig exceeds all other fattened animals of the farm.

CLEAN PIGS AND DIRTY PIGS.—Pigs enjoy the reputation of having a real liking for dirt; and, certainly, the way in which they are kept on some farms would show that their owners are determined to give them ample opportunities for carrying out this liking. No notion can, however, be more erroneous than this, as none is certainly so productive of loss to the keeper. Let any one not convinced of this try the two modes of pig-keeping—the dirty and the clean—the food in both cases, and other general treatment, being the same; and the result will show him which of the two is the best in the end. A great deal depends upon the mode in which they are housed. Mr. Raines, of Mills, adopts the following:—A large onthouse is enclosed at the sides, so as to be warm and dry. The floor is paved and sprinkled over with burnt clay, and ashes obtained by burning

weeds. In this the pigs are fed; while for resting and sleeping they have a compartment railed off at the other end, and which is amply provided with clean straw. In another case, the principle of box-feeding has been applied, the pigs being kept in a pit, into which the manure from the ox or cow stables and the horse

stables is put. The pigs tread this down, and enjoy themselves amazingly. In one case, where this plan has been adopted, the farmer states that his pigs "have given him a profit by their meat, and left the dung—as good as guano—for nothing.—*Scottish Farmer.*"

ON THE SANITARY STATE OF TOWN DAIRIES.

The common practice pursued in the management of milch cows in the metropolis and our other large towns is a long way out of date. However spacious buildings may be, even granting that cows were housed in separate apartments, and these equal in architectural style and dimensions to the best rooms in Buckingham Palace, and the dietary free from objection, the smoky, dirty, polluted atmosphere of towns, and the noisy turmoil, together with the other et ceteras involved in town life, are incompatible with the sanitary requirements of a milch cow. Very little requires to be said in order to prove that the manufacture of milk is a work that imperatively demands the pure air and comparative retirement of the country, the full enjoyment of the blessings of country life in this respect being no less essentially necessary to the health of milch cows than it is for the health of the inhabitants of large towns and the pecuniary interest of cowkeepers, because upon such depend the quantity and quality of milk, the profits of the dairymen, and the health of their customers. And these data apply with as much force to the cows of private families as to those of public dairymen. No doubt, in both cases, many establishments could be pointed out, in which cows are in good condition, and in the enjoyment of apparent good health, and yielding, at the same time, an abundant flow of thick milk, as indicated by the lactometer.

We have on more occasions than one been told this, when reasoning the matter with the cowkeepers themselves, while examining the dairies of the British capital during the last eighteen years. But it must be borne in mind that fatness is no true index of health: much less does the lactometer give a true indication of rich milk; for, when we appeal to the books of cowkeepers, they prove, without a single exception, to the contrary—that milch cows in the capital are short-lived animals; while the specific gravity and thickness of cream are due to an excess of saline and abnormal fatty and other matters that rise to the surface of the milk when kept to throw up cream. To those who know no better, such milk may "pass muster;" but it has precious little of the flavour, general richness, and nourishment of country milk, when the cows are properly fed on natural food. In short, healthy suburban detached residences for the milch cows of the metropolis have become as essentially necessary in our social economy as suburban detached residences for our "city princes," and in both cases for similar sanitary reasons.

Season tickets for cowkeepers with their milk-cans a few miles into the country twice a-day will be no new proposition ten years hence, but an established realization in the march of improvement. In point of fact, it is so at the present date. There may be a greater variety of ways in carrying out the proposition into practice than at present; but the progress of the general principles involved in the enunciation are daily becoming more and more a matter of certainty in the general economy of the trade; for the conveyance of milk in from the country twice a-day is a practice that is rapidly increasing; and were landlords and their tenants to turn their attention more closely to the defects of town dairies, the requirements and increasing demands of towns, and to the establishment of dairies on the most approved plans at all the railway stations along the various lines within the limited distance of milk conveyance, the supply of genuine country milk would soon supersede altogether the crude, abnormal, saline produce of intramural dairies. Towards the circumference or inner circle of the suburban districts, cowkeepers may rent a small paddock each, for example, or purchase the fee-simple, and, upon these, erect proper household accommodation for their stock, and then bring in milk in their own carts. But in the more central districts of the metropolis the progress of things rather indicates a more extended subdivision of labour between town and country—the former (the town branch or division

of the trade) being confined exclusively to the retail commerce of milk, in supplying milk-walks with their demands twice a-day; while the labours of the latter (the dairy farmers of the country) will be exclusively confined to the produce and wholesale of milk, including its regular conveyance and delivery in town. In other examples, a large dairy-farmer in the country may open milk-walks in town, and thus bring in his milk by rail, and retail it daily; and we may add that the examples already in existence of each of these plans are too numerous to be mentioned individually.

This, however, is not exactly the principal view of the subject to which we wish more particularly to direct our present observations. Enough has been said to show that the removal of town cows to the country involves a great work of progress in the supplying of the metropolis and other large towns with an abundance of wholesome milk. While, on the other hand, the special object of our remarks that follow will further show that the growing prevalence of contagious diseases and the heavy loss generally sustained from a low degree of health, and the consequent ruinous tear-and-wear upon cow stock, more especially in the metropolis and a few other towns, will compel cow-keepers to remove their stock to the pure and unadulterated atmosphere of the country, and to adopt a more natural system of dietary than is now in force. The heavy mortality amongst milch cows, under the cattle plague now raging, and the liability of milch cows to be affected by typhoid diseases, when confined and fed as they are at present in a close and impure atmosphere, are such as to justify the prohibition by statute of keeping milch cows within—say, for the sake of argument—a five-mile radius of St. Paul's at this date. This limit to extend as the area within this circle is filled up with buildings; the statute to apply to all other towns. In short, Parliament must interfere, and compel town dairy-cows to be kept in proper buildings in the pure air of the country, to be fed on proper food, and to be free from crowding and the other proximate causes that generate pestilential miasma, muscular and nervous debility, and finally typhus fever and other contagious diseases. It will also be necessary to prohibit milch cows and young dairy stock from being bought and sold in the metropolitan cattle market, and in all similar cattle markets, where crowding and exhaustion are experienced.

It will be no easy matter, judging from past experience, to bring the cow-keepers of the capital to subscribe, either to the growing necessity of a country life for their cows, or to the propriety of statutory measures to enforce the practice; and the same may be said of the cow-keepers in all our other large commercial and manufacturing towns. We can readily imagine, for example, a thousand objections being raised to both propositions, based on the utility of the former and on the arbitrary unconstitutional character of the latter. But when such objections are examined from a practical and scientific point of view, they only amount to a humbling degree of ignorance and prejudice, with innumerable antiquated habits that are fast giving way to the improved practices against which those very objections are levelled. Thus, it will be argued that dairy-stocks, beyond the five-mile circle specified, have suffered as much from the cattle plague now raging as those situated within that radius, and that cows in the latter examples are just as healthy and free from any predisposing cause to typhus as cows in the former, and therefore the practical conclusion will be drawn that it would be both unreasonable and unjust to remove cow-keepers the long distance of half-a-dozen of miles from their milk-walks, as such would amount to twenty-four miles daily. But however closely tied down and professionally blind certain classes of the community may yet be to antiquated prejudices and short-sighted habits in the daily routine of their affairs, and however barbarous may be their notions relative to the dietary and health

of horned cattle, all who know anything experimentally about town life and country life in a sanitary sense, and the physiological requirements of a milch cow, must perceive the fallacy and untenable character of such objections to the improvements in question; for, granting that country dairies are badly managed, that does not prove town dairies to be conducted in the most improved, economical, and profitable way. In short, both town dairies and country dairies are subject to vast and needful improvements, as much for the profit of the cow-keepers themselves as for the health of their cows and the pecuniary and sanitary welfare of their customers. If it is true, as political journalists generally argue, that the cattle plague is neither less nor more than typhus generated in the London dairies and cattle markets, including its lairs, &c., then the practical inference to be deduced is manifest, for cow-keeping and marketing are in a very rotten state, and the losses now sustained by London cow-keepers no more than what they justly deserve. But whether the cattle-plague was generated in the London dairies, or imported from Russia in live-stock or agricultural or other produce, from the Black Sea or Baltic, or from Egypt, the East Indies, &c., is only a question of degree; for, according to the former hypothesis, the rotten state of the London dairies is the generating cause, while, according to the latter, it would be the predisposing cause—assuming always that the steppe-murrain of Russia is in verity a typhoid disease, produced by pestilential miasmata, and not a nervous, spasmodic disease, produced by the sting of an insect, as the "tsetse" or the like, under a vitiated state of the solids and fluids; for there cannot be a doubt that the food and general management of milch cows in the dairies of London, and in many country dairies also, are sufficient to produce the predisposing cause—muscular and nervous debility, and, next, typhus fever itself. Now most medical men, who have studied the prevention and cure of typhus in man, must be perfectly aware that, in the former case, pure air, a generous, wholesome diet, and plenty of breathing-room, more especially over-night, in the absence of the stimulus of light, and under the lower force of vitality during darkness and sleep, form the rule—conditions wholly incompatible with town dairies. Consequently, cure, or rather, the assisting of Nature to cure herself, resolves itself into a very hopeless task, if not an absolute impossibility, in the overcrowded area and confined, polluted atmosphere of a London dairy, and, we may add, the vast majority of country dairies also, and even the open fields of the country, when management in other respects is defective, and the system, consequently, in a vitiated state.

The secretion of milk is a natural process that involves a large amount of nervous action, and, consequently, tear-and-wear of the whole system. Hence the reason why great milkers consume a large amount of food, and why they are, nevertheless, thin, being often compared to "nothing more than skin and bone," and why they are so soon worn out. Hence also the reason why milch-cows are so easily agitated, and even irritated, by any exciting cause from without or from within, as by a change from a rich to a poor diet, and the like. The change of a cow-man, for example, or the change from one place to another, as when sold in market, has been known to put some fine milkers almost dry for a short time, although the change thus experienced by them was in every other respect to the better. Not only, therefore, do milch cows require pure air and a plentiful supply of rich natural food, but also the most gentle and uniformly-kind treatment that can be given them; and perhaps no creature in the world is more sensible of such kindness, or more thankful for it, her sole

pleasure, as it were, being to labour night and day in order to return her owner the greatest possible remuneration, both as to quantity and quality of milk.

The function of a milch cow is thus a very interesting proposition, but one that is very little understood in a scientific sense, or attended to in a practical one, by the vast majority of cow-keepers. This is much to be regretted, no less on their own account than on that of the general public; for the upshot is, that not more than half the quantity of milk is consumed that otherwise would be used, were milch cows treated according to their physiological or natural requirements, so as to produce rich, well-flavoured, wholesome milk.

Although the cow is naturally the habitant of low-lying pastures, and will even wade to the knees to obtain the succulent grasses produced by springs and flowing water, she is nevertheless extremely sensitive to a pure atmosphere and dry bed; for, after she has filled her belly with such grasses, she will go a long way to obtain her natural wants in both these respects—viz., a dry bed and pure atmosphere, in which to lie down, ruminate, and fill her udder with the rich beverage she yields as the produce of her industry.

How different is the experience of the milch cow in the British capital, even in the most favourable examples! the whole system of dairy management, if system it can be called, being diametrically opposed to her natural requirements. To say that John Bull had offered a golden medal for the most effectual system of generating typhus, and that the cow-keepers of the capital, one and all, were competing for the prize, may be considered, perhaps, an exaggeration; but it nevertheless embodies a very faithful exposition of the facts of the case. True, pure air in London cannot be had for any money. But is not this the very key to the true solution of the point at issue? for if a proper site is chosen, pure air can be had in the country for nothing. And even in the country, pure air in a cow-house is a much more comprehensive question than is generally imagined; for milch cows require a much greater amount of household accommodation than they now receive, or what is now proposed for metropolitan cows—viz., 1,000 cubic feet; and when sickness occurs, they require a still greater area of house-room, as compared with ordinary occasions of health. If cow-keepers will only visit our hospitals, and measure the area of house-room apportioned to each patient, and then multiply that area by ten, for the requirements of a milch cow, they will at once perceive the force of our general argument, that to erect buildings in the capital, suitable for cows during the typhus-breeding months of summer, is an absolute impossibility, practically speaking; for it is in the country, and only in a few select parts of it, that milch cows can be accommodated with those atmospheric conditions that are essentially necessary to their health and the secretion of a plentiful yield of rich milk.

The work of improvement is evidently one of degrees, even granting that statute law should interpose to enforce its completion within a given time. But, whether Parliament interferes or not, the work is already in progress; and the sooner it is finished the better for all parties interested. Short-sighted cow-keepers may conclude otherwise, and cling to their antiquated and unhealthy cow-hovels until a diminishing business compels them eventually to sell for a "losing whistle;" but the cattle-plague now raging will open the eyes of the more thoughtful to a timely sense of future duty and interest; and it is to be hoped that, upon the whole, this will be the general rule in the British capital—the securing, without delay, of healthy paddocks near railway stations for dairy homesteads.

IMPERFECT RIVER DRAINAGE.

The season reminds us of the expression of sympathy we again owe to those of our fellow-creatures who are doomed to live in our undrained river valleys. The populous low grounds of the Ouse may be taken as an example. Here we have the two county towns of Bedford and Huntingdon whose inhabitants must of necessity suffer seriously from the present state of that river. Kimbolton, with Kimbolton Castle, the

baronial residence of the Duke of Manchester, situated on one of its tributaries—the Kym—is, perhaps, worse than either; while hundreds of cottages, besides other towns, villages, and hamlets, are about as bad as bad can be. Looking down from the high grounds into this valley, as we have frequently done about daybreak this season, and casting the eye along the slumbering fogs in which so many human beings uncon-

sciously spend almost every night, and sometimes the greater portion of the day, and then turning to the chemical question which such a state of things involves, "one's flesh," to quote a rather common but significant phrase, "begins to creep upon the bone" at the thought of consequences. Fortunately for many of those who live in such low-lying districts, very little is yet known, chemically, by them of the direful influence of the pestilential gases that arise from decaying animal and vegetable substances, and the peculiar agency of these fogs in the production of disease. When those accustomed to breathe the pure atmosphere of higher levels descend into such miasmatic grounds, they feel a sensation not very easily described; and, when they return home, they again experience relief; but the inhabitants who reside constantly in such districts are not sensible of what they actually experience, owing to the effects of habit upon the constitution. They are, however, by no means exempt from suffering, although unconscious of the proximate cause of their malady. There may be a general credence in the district that the low standard of health is attributable to its impure atmosphere, and that this impure atmosphere is caused by stagnant water from imperfect drainage. So far is mere traditional "hearsay," handed down from time immemorial; but ninety-nine out of every hundred know comparatively nothing of the chemistry involved in such phenomena, or they would not sleep a single night in such low-lying pestilential habitations, at least those of them who could afford to rent a dormitory on a higher level—one beyond the reach of the noxious gases.

The case is a very strong one, involving not only the violation of one of nature's laws, but also the expiatory punishment which such merits at the hands of Retributive Justice. The loss is heavy, falling not less upon the purse than upon the person; for, while the bills of the family doctor are high, incomes are low, and the labouring population so enfeebled as to be unable to do a day's work; so that labour is much more expensive than it otherwise would be to employers. Horses and working cattle are similarly unfit for duty; while the loss on breeding and fattening stock is, in many situations, very heavy; consequently, the sum total of the losses on both sides is something considerable.

It is a matter of much regret that the proper steps have not been taken to estimate these losses practically. Were those interested sensible of the loss they thus sustain annually, more would be said about river drainage, and the imperative necessity of its being thoroughly executed without delay or any regard to the short-sighted and selfish opposition that is often allowed to stand in the way as an effective barrier. This is no less applicable to landowners, farmers, and their labourers, than to the inhabitants of such towns as those already mentioned. The dogged indifference with which both town and country entertain their respective positions in this respect is certainly highly reprehensible. If no doubt arises from the sacred regard which in this country is extended towards private interests—to the peculiar doctrine generally entertained of the inalienable rights of land, especially the more valuable "nooks and corners" occupied for manufacturing and commercial purposes, and to the somewhat easy manner we take the invitation to rise and go along with the times. But although such a spirit may be highly commendable in every case where it accords with public and private interests; yet in the example before us, it has long ceased to be applicable, every obstruction to river-drainage having out-lived its day and generation, any claims to rights appertaining thereto being nothing more than the last struggles of nature in throwing off the mortal coil—the unconscious movement of the foot and leg, as it were, when the heart has ceased to perform its functions—the remains of what was once a noble structure of great public and private usefulness, but which has now ceased to live, and must therefore be consigned, like other remains, to its final resting-place, in order to make room for the offspring of the present age.

That mills, canals, bridges, and the other ninety-and-nine nameless obstructions to river-drainage were great things in their day, is now matter of historical fact that admits of no proof to the contrary; and more than this, for there is something so genuine about the old mill and its appurtenances, the canal sluice, the barge and its companions, &c., however antiquated they may be, that, when gone, will be missed by many a friendly eye to thorough drainage. When that day comes—and come it must—it were difficult to anticipate the

theme of the poet or the shade of the landscape-painter. No doubt new scenes will arise in place of the old, each possessing its own meritorious charm to the artist and the lover of the picturesque; but the old lordly willows that have enjoyed the admiration of more generations than one, with the old millers and their mill-carts, will be nowhere to be seen. These, with a long list of splashing mill-wheels and the busy train of canal-craft, will have ceased from entrancing our imperfectly-drained valleys with their betwitcheries, and for them a modern bard may sing of "passing clouds shedding tears," or artist's pencil portray some chaotic exegesis of the passing moment; and what is more, we can well afford to sympathise with all who may thus be called upon to experience affliction or bereavement of this kind before the change has actually taken place. Up to the last hour of the present drama this is no more than natural; but when once the curtain falls, and new bridges begin to span our rivers, leaving a clear water-way, from source to confluence, for thorough drainage, the new scene will not be devoid of its engineering and agricultural attractions, and to these we must now proceed to turn the reader's attention.

It is only when our river valleys are properly drained, and the profits of the new system have begun to flow in, that our present losses can be practically estimated. In other words, when once we pocket the difference between no-drainage and drainage, if we may be allowed the expression, then we shall know the amount of our present loss and of our future gain; and, besides the *£ s. d.* view of the picture, the more cheerful appearance of the landscape will bear a comparison at least with the present. Just now it has been shown that neither the inhabitants nor the cattle enjoy that degree of health which they will obviously do under a proper state of drainage and aeration of the soil; and, with the exception of a few aquatic plants, as the willow and some grasses, the present unhealthy state of the vegetable kingdom will also be changed to the better. In both cases the difference will thus manifestly be greatly in favour of the future—an ugly abnormal state of organism giving place to beautiful symmetry, both in the animal and vegetable kingdom.

The soundness of these conclusions is amply borne out by many examples where the drainage of low-lying districts has already been effected. There is not in the kingdom, perhaps, a single county which cannot show its example of great improvements having been effected in the health of man and beast, and also of the different crops produced by drainage, harvest being greatly more abundant, and in some places nearly a month earlier. In every case, the change that has taken place is so much in favour of drainage as to render detailed argument in its support superfluous.

The rationale of these changes, already alluded to in part, although not yet ascertained in all its chemical details, is, nevertheless, sufficiently known to entitle it to the appellation of a practical demonstration. Thus, in the case of undrained land full of vegetable matter, the decomposition that takes place in an excess of water gives rise to the "Will-o'-the-Wisp" or "Jack-o'-Lantern," that yet haunts so many of our valleys (phosphuretted hydrogen), and also to sulphuretted hydrogen gas—one of the most poisonous of all the gases; for air containing only 1-1500th of its volume of it was found to kill a small bird instantaneously, 1-800th to kill a dog and 1-150th a horse. Now, in these two gases we have to draw attention to the conversion of some of the most valuable fertilizing elements of manure, viz., the phosphorus, the sulphur, and the hydrogen, into pestilential malaric no less deadly to ourselves than to our cattle and cultivated crops. Whereas, on the other hand, in the case of properly drained and aerated land, the oxygen consumed in the process of decomposing vegetable matter is obtained partly from the atmosphere contained in the pores of the soil, and partly from the moisture it also contains, so that the nitrogen of the former and hydrogen of the latter are liberated along with the sulphur and the phosphorus in a nascent state, in which process one of the richest ammoniacal manures is formed, thus accounting for the great fertility of such soils, not unfrequently reported by practical writers to be "inexhaustible," the weight of crop and amount of cropping exceeding that of the best artificially-manured land. Hydrogen and nitrogen thus liberated have long been known, by various processes in the laboratory, to unite—forming ammonia. Henry, in his "Elements of Chemistry," gives an account of no fewer than three such pro-

esses. The Society of Arts has offered a premium "for the production of ammonia or nitric acid from their elements, by methods which would admit of practical application;" and in its *Journal* of May 20th, 1859, will be found a paper by Alexander Williams, Esq., of Neath, "on a new method of manufacturing ammonia," which corroborates the natural process to which we have above directed the reader's attention.

The productive value of low-lying land when undrained, it will thus be seen, is very different from the productive value of the same land after it has been thoroughly drained and aerated, or broken up so as to admit of the free circulation of the atmosphere to the roots of the growing plants, and to decomposing vegetable matter. Many appear disappointed at the effects produced by the drainage of low-lying meadows and grazing lands, and hastily conclude that the present system is better for the farmer. But premature conclusions of this kind are deduced from mismanagement; the newly drained grounds in question not having been aerated so as to supply its quota of oxygen and nitrogen in the above process of manufacturing ammonia in Nature's laboratory, *the soil*. Imperfect as are the details we have given above of this natural process, enough it is hoped has been said to show the reader the important part the nitrogen of the atmosphere, or rather the air itself, plays in its successful completion; for without a suitable supply of air, sulphuretted hydrogen and phosphuretted hydrogen would be produced as at present, so long as the land contained moisture; and afterward, during the drought of summer, moulding and emaciation would be the results. Under such circumstances the case is certainly worse for the farmer than at present. We have had occasion to examine professionally numerous examples of this kind, where the tenant

had less hay and pasturage after drainage than previously. But this is no argument for the contrary practice of drowning land, for the grasses that generally grow on wet meadows are not those adapted for them when newly drained, so that a twofold change has to be produced before profitable results are obtained; for, in the first place, the generality of newly drained meadows require to be aerated, and in the second place to be stocked with herbage suitable for the improvement. Sometimes the opposite extreme is experienced, newly drained meadows being open and spongy from an excess of undecomposed vegetable matter, in which case the application of clay, sand, lime, bones, &c., is had recourse to, and not unfrequently paring and burning. But details of this kind are foreign to our present subject.

The conclusion at which we have arrived is thus a very brief one: fresh air is no less a blessing to the plants that grow in our fields and to the manorial resources of the land than to ourselves and our cattle. But we deny our great river valleys this blessing, *pure air*, by keeping the soil full of stagnant water, thereby converting their productive resources of health and wealth into their contraries—pestilence, bad health, and poverty. The loss is incalculable to the whole population that inhabit these undrained districts. The small advantage now derived from mills, canals, &c., is like a drop in the bucket when compared with it, and is no longer adequate to preserve the balance of public rights in a state of equilibrium. In short, mill rights and canal rights in our great valleys have long outlived their day and generation, virtually now ranking with things obsolete, while the grievances of those who have so long suffered from imperfect river-drainage demand immediate redress.

HOW TO TREAT GRASS LANDS.

Mr. OLIVER, of Penhallow, read the following paper at one of the meetings of the St. Austell Farmers' Club:—Should a farmer nowadays complain of the low price of grain—which he is certainly justified in doing—he is likely to meet with this sharp retort from consumers, "Why don't you lay your land down to grass, that we might have shamble meat cheaper? Surely the price of beef and mutton is high enough!" thinking, no doubt, in their ignorance of agriculture, that by increasing the breadth of grass land we should increase the quantity of stock; but, as practical agriculturists, you are fully aware that the arable land of this country will carry a much larger amount of stock, when properly cultivated, than when laid down to permanent pasture. If, therefore, in a national point of view, cereal crops will pay the expense of cultivating, such land should not be laid down permanently to grass; for by so doing there would be a diminution of both labour and produce. Moreover, should these suggestions be adopted, consumers in this country would find themselves rather awkwardly situated in winter, when foreign stock cannot reach our shores, if winter fattening were discontinued, as it must necessarily be, on grazing farms.

1. In treating on the subject of grass land, I do not intend to confine my observations to permanent pasture, but to grass land generally, and will commence with seeding.

Previous to seeding, the land should be carefully freed from weeds; and in order to accomplish that object, as well as to prepare a compact and suitable seed-bed, the surface should be well pulverised. In selecting seed, particular attention should be paid to the kinds of grass found to flourish, and such as are readily eaten by stock on adjacent land of similar quality; for it is surprising what effect soil and climate have on vegetation. Grasses which are eaten by cattle with avidity off certain soils will be rejected when grown on soils of a different character; hence the necessity of studying nature in the selection of seed. Seedsmen, however, frequently proffer a mixture regardless of the character of both soil and climate, which to me "savours strongly of the shop." I have seen many fields, that have been injudiciously sowed down for permanent pasture with those mixtures, rendered almost valueless for many years, although heavily manured, by the coarse, inferior grasses domineering over the finer sorts, so that it has been found necessary to rip them again at a considerable sacrifice. Old grass land, in the

light soils and humid climate of Cornwall, is generally found to abound in soft grasses, chiefly of inferior quality, ill-adapted to the fattening of either cattle or sheep, especially woolly, soft grass (*Holcus lanatus*), which is of little value. It is, therefore, necessary to introduce some of the hardier kind of grass, such as the foxtail, catstail, or timothy grass, which appear to be well adapted to our loam soils; cocksfoot, a grass calculated to keep the digestive organs in order; rough-stalked meadow grass, &c. These grasses should, however, be but sparingly used with Italian and common rye, mixed with different kinds of clover (especially Cornish mail, which will remain much longer in the land than any other variety), so that, when the short-lived sorts die off, those which I have named, with others indigenous to the soil, may fill up the vacancy. The quantity of seed recommended by seedsmen is, I am persuaded, much too great. Grass crops suffer from being planted overthick in the same proportion as grain or root crops. Much care is required in sowing grass-seeds. It should be done by broadcast machines; and even then, to ensure its being rapidly sown—which is a matter of great importance—the land should be twice sown, by taking half the machine's breadth only at a turn. Rich soils, intended for permanent pasture, should be sown about the end of July without a corn crop. Good arable land should be sown about the middle of May with a corn crop, or earlier, if with wheat, and the crop be forward. Light, plain land, which should be but seldom tilled, is most profitably seeded down about the middle of July, without a corn crop, adding two quarts of rapeseed per acre, which affords much keep in the autumn or following spring. I would observe, by the way, that, when coarse upland pastures require to be "renewed," and are broken up for that purpose, the natural or indigenous grasses should by no means be destroyed, since grasses of a superior order cannot long exist on elevated poor land; and while it is impossible to purchase the seed of many of the native grasses, it is more economical to propagate from plants.

2. The manuring of grass land is a very interesting question; its effects are really wonderful. "Muck" is said to be the mother of manure; we will therefore first consider its varied effects, which will, of course, in great measure depend on its preparation, composition, and application.

This brief paper will not admit of my dilating on the two

former questions; but, with regard to the latter, I would observe that, in order to improve a coarse, old pasture, dung should be well fermented, or, still better, decomposed, by being previously mixed with rich calcareous or aluminous soil, and applied in the autumn, the grass being first eaten close. Should it, however, be desirable to increase the quantity, recently made and slightly fermented manure should be supplied in the spring. On rich arable land I consider that farmyard manure is most profitably applied on the second year's grass, slightly fermented, in the spring; but on plain arable land I think it would be more advantageously applied in a similar manner to the first year's grass. As a rule, I am decidedly of opinion that farmyard manure is most profitably applied to grass land, taking into consideration the facilities afforded for its application, in the autumn and spring, when teams would frequently be unemployed—economy of labour being a matter of great importance. Many persons are of opinion that when dung is applied to the surface of land much of its manuring properties escape into the atmosphere. Experience and observation have, however, long taught me to think otherwise; and Professor Voelcker has lately, by a series of experiments, distinctly proved that it is benefited by exposure. Some years since I manured a field in February with recently-made yard manure. We had a continuance of cold, dry wind for about two months after. During that time the manure was frequently brush-harrowed, so that it had the appearance of short, dry straw; nevertheless, its effect was manifest long before any rain fell, and afterwards it was extraordinary—so much so, that I feel confident that I never applied manure to greater advantage. Lime is, no doubt, a valuable rectifier of rich old grass lands, by acting upon and decomposing inert vegetable matter, and neutralising acidity; but I consider it to be much more valuable when mixed with salt, having seen some wonderful effects from the application of that compound, to which sand is a great acquisition. I mix equal quantities of fish salt and quicklime, and then cover the heap with half the quantity of sea-sand, which prevents evaporation, fermentation being very great for many days; but when it has subsided I mix the whole well together, and subsequently apply it to the land by means of a manure distributor with great effect. If land be mossy, it should be well harrowed with a close, short-tined harrow previous to spreading the manure, and subsequently be chain-harrowed and rolled. Peruvian guano and nitrate of soda are both very stimulating manures for grass land; but, since they have a tendency to promote the growth of coarse grass, old pastures so manured in the spring should be eaten close with stock up to the middle of June, in order that the finer grasses may have an opportunity of taking their place, or the pasture is sure to become coarse, when the manure is frequently blamed instead of the management. Grass produced by these manures is readily eaten by both cattle and sheep. Bone, however, I consider to be generally the best manure for grass land in Cornwall, our humid climate being rather calculated to produce quantity than quality; and since a large amount of dairy produce and young stock is annually exported, requiring for its production a large quantity of bone-earth, that constituent must necessarily be employed to keep up the fertility of the soil; for, although there may not be a very perceptible falling off in the quantity of grass, the quality frequently becomes inferior from want of phosphate of lime, which, no doubt, is also essential to the health of stock. There are many instances in this county where the judicious application of bone manure has caused old grass land to carry double the quantity of stock that it formerly did, and that, too, of very superior quality. Previous to application, bones should, if convenient, be slightly decomposed either by fermentation or by mixing with the heap a quantity of liquid manure, the mass being well covered for a time by ashes or mould, which, when fermentation has ceased, should be carefully mixed, or sulphuric acid may also be used for the purpose; or it may advantageously be mixed, some months previous to being spread on the land, with way-soil or the cleaning of ditches. Bone manure should be applied early in spring, old grass land being well harrowed before and after. Such land should subsequently be cut for hay, since the bone will for a time interfere with the feeding of stock; and long grass has a tendency to fix and bury the undecomposed pieces of bone. Adulteration is, no doubt, a great check to the application of artificial manure generally, which in many cases is difficult to detect save in the deficiency of our crops. The safest plan, therefore, is

to patronise respectable manufacturers, and not suffer ourselves to be gulled by vendors offering cheap goods, which are not unfrequently nasty.

3. The storking or cutting of grass land requires some consideration, which will, of course, depend greatly on its character.

I consider, however, that under all circumstances it is unwise to eat young seed plants with sheep until they have taken a firm hold on the land, since sheep are apt, by biting close, to pull up a considerable number and injure others. Young cattle are, therefore, preferable to take the first cropping, since, while fastening the land, they do not bite close. Grass intended for permanent pasture should not be cut the first year, but be stocked close, in order that the finer grasses may have an opportunity of taking their place, which are frequently smothered when the crop is cut. Old pasture land should be occasionally mown, but in all cases early; otherwise rank grasses are sure to dominate over the finer varieties, and the sward consequently becomes coarse. On shallow, quick, arable land, the first year's seeds should be cut. If eaten, the land, being exposed to the scorching sun, frequently produces but a light crop of grass, while, if shaded, it would have produced a heavy crop of hay.

4. The mechanical condition of grass land is a subject worthy of notice, since it has great effect on the character of its produce—light land being congenial to the growth of bent and inferior grasses generally, while firm land is favourable to the leguminous grasses, and those containing the largest amount of nutriment.

I therefore consider it prudent to stock our dry old pastures heavily with mixed stock during the winter, and find that the part which gets the greatest amount of treading invariably produces the best quality of grass the following summer. My old pastures at Trescowe are frequently infested with the grub of the cockchafer and other worms, which render portions of the land very light, thereby exposing themselves to the prey of rooks, and at times apparently destroy all the grass of a considerable breadth of land; but for many years past, on discovering the location of the grub—which is perceptible from the dry, coarse nature of the grass—when the land is very wet in winter, I have roots carted on it, and there consumed by cattle, treading the land very firm, which entirely destroys the baneful effects of the insect, and causes the land to produce grass of superior quality for many years. Grass land is frequently rendered too light through the instrumentality of earthworms, by driving into the subsoil and depositing the fine mould on the surface—a valuable process, if kept within bounds, but, like miners generally, they are apt to do great injury by cutting off a sufficient supply of water. They must, therefore, either be destroyed or their effects counteracted by some mechanical means. The mole is, no doubt, very useful in destroying grub and various kinds of worm which injure our cultivated crops. Moles will occupy land no longer than they find food. I have seen many crops of both grain and roots saved through their instrumentality, but am not aware that I ever saw one injured by them. The chain-harrow is an excellent implement for spreading the earth deposited by them on the surface. Nature's little drainers, the earthworm and the mole, bring to mind the necessity of draining wet land previous to laying it down to grass. Stagnant water not only prevents the growth of superior grasses, but promotes the growth of those of an opposite character. All wet low land should therefore be drained and trench-ploughed previous to being laid down to permanent pasture.

5. In conclusion, I would observe that I consider it desirable, with the existing price of agricultural produce and labour, to increase the breadth of grass land in Cornwall in the following manner:—

1st, By allowing arable land to remain four or five years out to grass, instead of breaking it up at the end of two or three years, as is now commonly done. By adopting that plan much better crops would be grown than at present, and there would be less complaint of clover-sick land, rotten roots, and light grain; while the expense of cultivation would be considerably diminished. Much land in Cornwall would produce good pasture for four or five years, that is not sufficiently strong to lay down permanently to advantage. 2nd, A considerable quantity of our elevated thin soils, kept under the plough, certainly cannot be properly cultivated with the present price of grain. Such land should be boned, laid down

to grass, and not tilled, save with the view of renewing the pasture; and that should not be hastily done, since the decay of certain grasses frequently makes room for those of a superior order. 3rd, Much of our deepest, best arable land might undoubtedly be laid down to permanent pasture with advantage; but, since laying down land for permanent pasture is an expensive process, and is a permanent improvement to the farm, enhancing its rental value, I consider that it is only fair

and reasonable that landlords should assist their tenants in accomplishing this desirable object, by supplying the necessary quantity of bone manure, the tenant paying, say, 5 per cent. on the outlay. If that system were adopted, the value of an immense quantity of land in this county might be doubled; whilst landlords, their tenantry, and the community at large would be greatly benefited. Permanent improvements are certainly the duty of landlords, and not of tenant farmers.

RAILWAY AND STEAMBOAT CONVEYANCE OF CARCASSES.

Although the conveyance of animal food from the provinces where it is produced, to our large manufacturing and commercial towns, where it is chiefly consumed, undeteriorated in quality or upon improved plans from those now in operation, has become a national question of the first magnitude, it unfortunately cannot be said that those engaged in the trade—such as railway companies and steamboat companies, farmers' carcase salesmen, &c.—have yet taken this view of it, practically speaking. Indeed, taking the British capital as an illustration, it can hardly be pronounced an exaggeration to say the trade is about as barbarous as can well be imagined in all its multitudinous ramifications. And this, too, is not even the most objectionable feature of the practice now in force; for when prospectively viewed it appears as if it were determined to move in the opposite direction of improvement, as the present mode of conveyance is daily growing worse and worse with the rapidly-growing increase of supplies. Our readers may well say, "This is not a very flattering exordium to any class engaged in the carcase trade, home or foreign;" but the time has obviously arrived when the plain facts of the case must be allowed to speak for themselves, in order to awaken the ear of the public to a national sense of duty; for an abundant supply of wholesome animal food for the Metropolis and our other large towns has already become the leading question in the political economy of the country. Not a few of John Bull's somewhat petted and pampered children are even becoming alarmed lest the growing prevalence of disease amongst our domestic animals should so interfere with supplies as not only to reduce their own daily allowance, but also permanently to enhance the price of labour now being demanded by the working-classes, so as to enable them to obtain what they require. What between cattle plague and high-priced meat on the one hand, and strikes for higher wages on the other, a large portion of the English public is so panic-stricken as almost to be afraid to face the future.

Grumbling is proverbially the native privilege of every free-born subject of the realm. There cannot be a question raised about this to the contrary. But grumbling after things go beyond a certain limit becomes very un-English, and this we aver is the true character of the groundless fears and apprehensions now being raised relative to the approaching scarcity of wholesome animal food; for in this case, as in all others of a similar character, Necessity will be found to be the mother of Invention; for if any ingenious inventor would only come forward and produce a method of conveying carcases by railway and steamboats free from the injury at present sustained, the discovery would hush into silence the hurricane of alarm that is now sweeping everything before its ruin-spreading course. So long as English farmers and dairymen and Continental farmers and live-stock dealers continue to congregate cattle together in increasing numbers at embarking and disembarking ports, and in fat-stock markets and town dairies, what can be expected but an increase of contagious diseases of a typhoid character? The contrary experience would fall nothing short of a miracle! But supersede this antiquated and highly objectionable plan of live-stock marketing, by improvements in the conveyance of carcases, as suggested above, and by a more natural and wholesome dietary for fat stock and milk cows, so as to enhance the quality of their flesh and milk, and the contagious diseases that are at the present time decimating herds and flocks (thereby lessening the future supplies of animal food to an enormous extent) would soon disappear; supplies would at the same time be greatly increased both in quantity and quality; consequently the profits to all parties now engaged in the commerce of animal food would be

greater than what they are at present even in the absence of disease; while the advantages to the consumer would be still more satisfactory. Such being the manifest conclusion, the practical course which farmers and the public ought to adopt is self-evident, viz., private sales or markets for breeding lean stock and milk cows, greatly improved dead-meat markets in all our large towns, and a proper method of conveying carcases to market by railway and steamboats.

In confirmation of the soundness of the above conclusion from a practical point of view, we have first to observe that of late private sales by auction or otherwise have been greatly on the increase amongst the agricultural body, almost all our improved breeds of cattle being thus sold at home where they are bred, and the intelligent observer of the progress of science in this branch of farm practice—one which is rapidly growing in importance—cannot fail to perceive that public markets are not the places that are suited for the exchange of our improved breeds, and that eventually Donnybrook and all the old uproarious public markets, with their rags, filth, and dirt, must give place to private sales. Our Metropolitan Cattle Market, for example, when seen in the light of progress, truly belongs to an age long gone by. The carcase trade, again, is anything but what it should be; nevertheless, as a branch of commerce, it is annually increasing, and fast superseding the live-stock trade, as has already been shown. And if such is the result under an antiquated method of conveying carcases, and even deplorable state of things generally, what would the result be under all the improvements contemplated in the different departments of the carcase trade?

Improved carcase-vans for common road and railway conveyance of dead meat, and improved steam-boats built for the express purpose of conveying all sorts of fresh animal-food from the continent of Europe and other places, together with improved slaughter-houses, setting-houses, and dead-meat markets, is no new proposition. With regard to the British capital, the subject is as old as that of the removal of Smithfield Cattle Market and the improvement of Newgate and Leadenhall Dead-meat Markets; and about the time of the Exhibition, 1851, in Hyde Park, we were told, by no mean authority, that so long as the Corporation of the city of London had the control of the markets the desired improvements contemplated were beside the question! The out-of-date character of the Live-stock Market, since then opened, and the no less antiquated character of the Dead-meat Market, now in progress of erection, certainly afford tangible proof of the soundness of the conclusion; and, further, the proposition of a CATTLE PLAGUE HOSPITAL is in perfect harmony with the above antiquated anomalies. The commerce of a suitable supply of animal food (including milk) for the British capital is a national proposition that has greatly overgrown the capabilities of the old Corporation of London to govern. A new tribunal is therefore absolutely necessary, in which the producer or agricultural interest should be better represented—a tribunal which would give more encouragement to private enterprise than a huge jobbing monopoly under "the cat's-paw" of few cattle-market hawkers, both of whose interests are, in a great measure, diametrically opposed to the carcase, conveyance improvements in question by railways and steamboats.

The subject requires to be thoroughly canvassed *de novo* in the provinces and in the columns of the agricultural Press. Farmers are very much to blame for their surliness of action in the matter, for were they to make themselves practically familiar with their present losses, and to let the engineering world know what they want, and their readiness to support

progress, the improved carcass-vans and steam-boats for conveying carcasses free from injury would soon be invented and placed in active operation, the former on every railway in the kingdom, and the latter between all the embarking and disembarking ports—from which and to which cattle are now conveyed—under the cold-blast-chilling, sweating, fasting, and inoculating processes. Whatever city corporations, cattle-market-bankers, with their salesmen and butchers at the other end, may say to the contrary, these are not the processes which animal food requires to undergo either for the interest of the producers or consumers.

At present, dead meat also undergoes two of these processes, viz., sweating and inoculating. We repeat, it requires no second sight to perceive that neither the purse of the farmer nor the stomach of the consumer requires chemical processes of this kind to qualify animal food (dead or live) for the English market. Moreover, the concentration of all sorts of carcasses into one large market—a market that is annually increasing in its demands—is just as objectionable in a sanitary point of view as the concentration of all sorts of cattle into one live-stock market, and the concentration of sickly dairy cows into large hospitals for the cure of typhoid disease. Surely we may take it for granted that the agricultural body generally are further advanced in chemistry and physiology than the sweating and other processes of the metropolitan live stock and dead meat markets imply. At all events, it is high time that they were so; for both these departments of the commerce of animal food is in a very unsatisfactory state at the present time, reflecting the highest degree of discredit to all concerned, more especially the agricultural body, who are evidently “selling their hen in a ratny day.”

Improved carcass-vans for common roads and railways, and carcass steamboats being the work of future discovery, nothing can be said about their construction at present. There are, however, certain principles that must be attended to in their construction, and also in the methods of conveying carcasses, which may profitably be discussed, together with the many shortcomings of the present system, both by sea and land; and farther, as numerous objections will, no doubt, be raised to the proposed carcass trade by those interested in the live-stock trade, more especially at the present time, when contagious diseases prevail, these also may be profitably disposed of in a single paragraph.

First: Different qualities of meat must be conveyed separately, and provision should be made for such in the construction of carcass-vans and steamboats for the conveyance of dead meat. In other words, there is a large proportion of animals in a less or more abnormal state of health, whose carcasses, when slaughtered, are liable to undergo certain chemical changes, equally different from each other; others to produce fungi; others protozoa; and these, if brought into close contact with the carcasses of sound, healthy animals, inoculate them, thereby producing the same chemical change or crop of fungi, &c. Obesity, for example, is a disease, and the carcasses of obese animals will inoculate the best meat, thereby reducing the two to a common equality. Without, therefore, going farther into detail under this head, we at once come to the practical conclusion that difference of quality must be scrupulously attended to in the conveyance of dead meat of every kind, both by sea and land, and for our metropolitan and other markets.

Second: Carcasses must be protected from the extremes of temperature—from the extra heat of summer as well as from the frost of winter.

Third: Carcass vans and steamboats must be thoroughly ventilated by artificial means, vitiated air being removed, and pure air supplied; and in effecting this the small penetrating dust of railways, and the moist and often polluted air of steamboats, must be excluded by charcoal filtration or other processes.

Fourth: In times when contagious diseases prevail amongst live stock, such as the steppe murrain at present, it may often be advisable to fumigate carcasses, and even to convey them in a disinfected atmosphere, although they have been entirely free from disease when first hung up in the setting-house. According to the organization of the carcass trade proposed, unhealthy animals would be virtually wholly excluded from the dead-meat market; for farmers would be obliged to give up rearing and fattening such animals—an alternative which would be greatly to their advantage.

Fifth: The sides, quarters, or legs of carcasses ought not to be allowed to lie upon or even touch each other in the carcass van or in the steamboat, otherwise they will very soon generate disease; and the meat will suffer less harm if carried suspended in the position in which it was cooled and set than if allowed to lie upon trays or framing of any kind. Land-owners, farmers, butchers, and provision merchants are familiar with the propriety, and even necessity, of attending to this, especially during the warm weather of summer, or during moist warm weather at any season of the year; and therefore it is surprising that so little has been done by them to effect improvement in the present barbarous method of dead-meat conveyance.

Sixth: Dead meat of every kind, including butcher-meat, fish, fowl, and game, should be conveyed directly by through trains to market in the shortest possible time, and, so far as practicable, during night; and it should be conveyed in first, second, and third class carcass vans, according to quality, as previously proposed.

Now, without going into details, which our present limits will not permit, we see no great difficulty in the way of a successful practical solution to each of the six foregoing propositions, so that objections of every kind fall to the ground. Indeed the contrary conclusion would obviously be throwing a reflection upon railway and steamboat engineers which they do not merit. At the same time the facts of the case evidently indicate that their end of the yoke is rather behind than in advance of that of the opposite party, the farmer and butcher; for the present railway and steamboat systems are the very reverse of what the above propositions involve. It is high time, therefore, for railway and steamboat companies to make a move in advance; and we venture to say that if they do so in the right direction they will meet with the hearty co-operation of the agricultural party in every province of the kingdom.

A FIRST PRIZE STOCK BREEDER.

MICHAELMAS RENTS ON CORN AVERAGES.

SIR,—I again avail myself of the return of the close of the farmer's year to send you, for the information of your agricultural readers, and more especially those who may have adopted the system of corn rents, based on the average price of wheat, or of wheat, barley, and oats, a statement of the average prices, founded on the returns published weekly in the *London Gazette*.

For the year ending Michaelmas, 1865, the average prices are as follows:—

	s.	d.	
Wheat	40	3 $\frac{1}{4}$	per imp. qr.
Barley	29	1	”
Oats	21	4 $\frac{1}{4}$	”

The highest and lowest prices during the same period are as follows:—

	Highest price.		Lowest price.		Differ- ence.
	s.	d.	s.	d.	
Wheat ...	Sept. 5	46 7	Dec. 30, 1864	37 10	8 9
Barley ...	Sept. 5	31 2	Jan. 6, 1865	27 3	3 11
	Sept. 12		July 18, 1865		
Oats.....	Aug. 1	24 0	Jan. 6, 1865	18 10	5 2
	Aug. 29				

I remain, Sir, your most obedient servant,
CHARLES M. WILLICH, late Secretary and Actuary
University Life Assurance Society.

2, Montpelier-square, Brompton, S.W., Nov. 6, 1865.

THE PROGRESS OF STEAM IN THE FIELD.

The friend is not always judicious. He is apt to say a little too much, to vaunt the excellences of his friend a little too highly. Possibly this is due to a remote tendency to self-exaltation; but whether this is so or not, the result is sure and certain. Disappointment always follows, and reaction.

When steam first came to the aid of the farmer in the field, a great deal too much was said—a great deal too much was expected. It was to accomplish in no time a complete revolution in all our tillage operations. It was at once to antiquate all that was, to reduce the expenses of cultivation to zero, and to impart to our soil its maximum fertility. The friends of steam were a little too enthusiastic—too sanguine; they made a trifle too much of their lion; and the consequence was that the immature power was numerically quizzed and pulled to pieces. A reaction set in, in fact; and we have heard very little of steam for some time.

It has been, perhaps, well for steam to be thus allowed quietly to work. Some hundreds of sets of apparatus were in private hands before this reaction commenced, and these during a series of years have been silently tested.

The result, we are glad to find, is satisfactory. The very wide expectations formed have not been realized, as a matter of course; but those of a moderate character have been surpassed. A silent and gradual revolution has been going on under the eyes of those men who have had the sagacity and courage to induce it, and every man who has worked his tackle with consideration and judgment is found to rejoice in its possession. They can show a far better balance-sheet than their less enterprising compeers, who have merely depended upon horse labour, and have reason to thank the circumstances that led to the change.

It is astonishing how difficult it is to arrive at any definite conclusion respecting an agricultural experiment, mechanical or chemical, or both. For such experiments in a general way there exists in the year but a few weeks, and therefore, before any reliable result can be obtained from experiments that have to be made amid a series of ever-varying circumstances of soil, climate, &c., several years must elapse. And then, too, so few farmers pretend to any accuracy in book-keeping, that it is really seldom that a man is found competent to institute a comparison with respect to the old mode and the new. It is exceedingly rare to meet with a farmer who by reference to any account can give the history of any one of his fields for five years back, and tell his querist in any one of these years what was the expense of cultivation, of manuring, of harvesting, and what was the produce. And if this cannot be done, how can he possibly give any but the most general and unsatisfactory reply to any one who questions him as to the advantages of steam cultivation? If there be no means for arriving at this special information with respect to the profit and loss account of each plot or area under cultivation, how is it possible to say where the loss or where the gain has been made in the year's transactions? The gain attributed here, or the loss there, may be very falsely attributed; and the apparent benefits of steam cultivation might, if properly analyzed, prove to be actually no benefits at all, but the reverse. In order to ascertain these things men must go into details, and not longer be satisfied with totals. The vague manner in which the expenses of a farm are calculated afford, for instance, a fair specimen of the reckless system of account keeping that must prevail. At any

market, fair, or farmers' club, let the question of horse-keep be started, and it will be found that the estimates of this serious item of expenditure will prove as numerous as the persons asked. Each will give a different reply.* There appears to be as yet no settled conviction on the subject. Most men will studiously avoid the subject altogether, with the remark, "Thank you, I would rather not know what my horses cost me: I know they eat up all the profit, but they are inevitable." So long as a want of fixity is observable in estimating the cost at which horse-power is maintained, there can be, of course, no certainty with respect to the calculation of processes in which horses furnish the motive power. In the same manner, but to a less extent comparatively (because it concerns a very superior class of men), the like uncertainty is found to prevail amongst men who are using steam-cultivating apparatus with regard to the statement of expenses. Very few of the persons who have used them have yet attempted to ascertain their cost; and, amongst those who have, fewer still have arrived at anything approaching to a satisfactory and fixed conclusion. The same might be affirmed of several other items of farm expenditure, which, had they been within the province of manufacturing proper, would long ago have been accurately measured and tabulated. So far as time is required for the necessary experiments, it cannot be avoided that years will elapse before reliable results can be announced; but so far as the announcement of such rules for guidance depends upon accurate accounts and accurate observations, there is nothing to delay the publication of such defined results, but the disinclination to obtain them.

Could the results of steam culture have been compared with those of horse culture for any length of time under the same invariable influences, like the testing of two machines in a room of constant temperature with material of uniform quality, we should long ago have known what we were about, and probably steam would have been far more generally used in farm tillage than it now is. The sanguine, who rarely wait for results, and the far-seeing who arrive at their judgments by a species of intuition, are mainly those who have had courage enough to become steam-plough men. The cautious are yet lingering. They pry over the hedge, and listen for reports. On this hand they are told of profit, on that of loss. So they oscillate between two opinions, and stick to their team till the light in one direction or another becomes clearer. Of those subjects of which men know least, they generally speak most dogmatically. On what conclusions it rests we cannot see; but there seems to be in the public mind a very firm conviction that steam culture is best adapted for heavy land, and will be confined to it. Nothing is more clear than that the steam horse is a God-send to the clay-land farmer. It came to him just when

* The following may be found in an early copy of the *Mark Lane Express*, dated Feb. 11th, 1837. A committee of the Harlestone Farmers' Club report as follows:—"Your committee, in common with every member of the club, was astonished to find that amongst a body of farmers, all residing within four or five miles of the place of meeting, all using a similar breed of cart-horses, and cultivating a similar description of land, such a marked difference in the expense of maintaining their teams should exist, amounting in authenticated statements to upwards of 50 per cent., whether estimated at per head for each cart-horse, or per acre for the arable land."

he began to see that his only hope was in deep culture, for which in horses he held no efficient power. But although it may at once be granted that the heavy clay land of Great Britain could not be developed without steam, it by no means follows that steam cannot be profitably applied to light land. The most surprising success has attended the light-footed motions of the strong steam horse on heavy land: the under-drain, the digging breast, and the winter's tooth together have wrought wonders on such sticky, tenacious clays as are found in Somersetshire, Gloucestershire, and Essex; but, with less to do, they will prove quite as effective where the soil is light and easily worked with horses. It may be true that the apparatus adapted to heavy is not adapted to light land: but, with an allowable accommodation in this respect, the power which is so invaluable in one case is quite as invaluable in the other. There are but few instances in which this can be seen, simply because light-land farmers have generally persuaded themselves that steam could never be of any advantage to those who could plough as deep as they wished with two horses. To one of these few the attention of the reader will be directed. It is not necessary to mention the name, the locality, or the implement maker: suffice it to say that the land furnishing this instance is of the lightest description, and rests on a chalk substratum.

The farm in question, within half-an-hour's ride of London, consists of 600 acres of mixed land, but land mainly under the plough. Of this, 300 acres are under the seven-course shift—potatoes, wheat, oats or barley, green rye, peas or tares and crop after, barley, seeds, wheat; 130 acres are under the six-course system—potatoes, wheat, mangels, wheat, seeds, wheat; 90 acres, under the four-course, lie at some distance, and are worked for sheep. The soil, which varies in depth from six inches to six feet, is not drained, and under all circumstances can be ploughed with two horses. Having thus specified the sort of soil dealt with, and the course of cropping, it may in the second place be well to show what work is usually performed in preparing for each crop. To begin, then, with the breaking up of the wheat or stubble, in September, for roots: If weedy, the plot is scarified and harrowed; and when the rubbish has been well weathered, it is turned down with a ten-inch furrow without difficulty. Manure is also covered in without difficulty, in the same way. The land, in spring, is ridged with horses; the dung is applied; and the ridge is split, and left for the deposit of seed. For wheat after potatoes, only one scarifying is required; for oats, the land is skimmed before winter, and a six-inch furrow, with ten load of manure, is given before sowing; for green rye the land is scarified, danged, and ploughed in September, and sown directly, so that it may be cleared from May to July following. As the rye is cut green, the land is danged and ploughed (generally with horse-power) as it is cleared; and, so long as the season serves, the vacant place is filled up with cabbages, dibbed, and subsequently with turnips, rape, &c. If the cabbages are removed in March, the land is fitted for spring wheat with a single furrow, if in April for barley. For wheat after seeds one furrow suffices. All this work by reason of being done at the proper season, quickly done, thoroughly done, is now effected by means of a ten-horse-power engine and apparatus, and nine horses. Formerly, that is to say so late as 1858, twenty-two horses were employed in producing a result for inferior dimensions.

The apparatus was supplied in the year 1859. The first attack upon the land was a formidable one for the steam-plough, and we may also add for the land: The soil was matted together with weeds, and the pan was exceedingly unwilling to yield to the thrust of the share. In the

register, which has been most carefully kept by one who had no foregone conclusions to serve—by one who took to steam on purely economic grounds—the work done for the first and following years is thus summarised:

For the crop of 1861—

Land under tillage	400 acres.
Days at work ploughing and scarifying ...	70 days.

The number of days in this year would have been greater had not the wet autumn of 1860 interfered.

For the crop of 1862—

Land under tillage	510 acres.
Days at work ploughing and scarifying ...	115 days.
Ploughing on hire	45 days.

For the crop of 1863—

Land under tillage	510 acres.
Days at work ploughing	84
„ thrashing	21—105 days.

It may be remarked in passing that the whole crop was thrashed by the ploughing engine.

For the crop of 1864—

Land under tillage	510 acres.
Days at work ploughing	75
„ thrashing	26—101 days.

Here again the entire crop was thrashed, and it may be further remarked that for these two last crops the work done in acres amounts to 575 in each year.

For the crop of 1865—

Land under tillage	510 acres.
Days at work ploughing	54
„ thrashing	29—83 days.

It is observable that the days occupied in thrashing increase, indicating a larger bulk grown; while the days occupied in ploughing and scarifying decrease, indicating increased facility in working, increased freedom from weeds, increased fertility, and pulverization: the soil, in fact, needing less culture. During the whole of this period the crops were visibly increasing, and at no time did the number of horses exceed nine.

The actual accounts received for the whole period being produced, together with vouchers for the entire expenses, it is simple work to reduce them to a table of annual cost, remarking by-the-by that the "account" includes the supply of several improvements made in the apparatus after the year 1859.

	£	s.	d.
Account	60	0	0
1 year's coal... ..	72	0	0
Oil	8	10	0
Depreciation and interest	100	0	0
	£240	10	0

The account against the nine horses is as follows—

	£	s.	d.
Cost for nine horses... ..	183	0	9
Hay	108	0	0
12 acres of green meat	84	0	0
Depreciation and interest on nine horses, valued at £40 each	45	0	0
	£420	0	9

Thus we see that the thrashing, cartage, and tillage on this farm of 600 acres is done, so far as horse-power and steam are concerned, at an expense of £660.

Many men may be unprepared for such a case against horses on a light land farm, but such we are assured are the actual figures. It may be objected that no allowance is made for manure in the statement; but let it be remembered that the account, on the other hand, is not charged with the straw, the repair and depreciation of implements, and harness used with the horses. Here, then, without attempting to balance the two cases with

exactness, is a power called in to displace and replace thirteen horses.

	£	s.	d.
The annual cost of the power substituted was	606	13	4
The annual cost of the substitute is	...	240	10 0

The apparent gain	366	3	4
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There are three considerations which go largely to increase the sum which, after the above process of subtraction, is left as gain.

Thrashing, when horse-power only was employed, and maintained at a cost of £1,026, was an extra; now that steam has displaced a considerable proportion of the horse power, and reduced the expenditure of certain specified operations to £660, thrashing is included.

The seasonableness and thoroughness of the tillage operations render altogether unnecessary the multiplied acts which used to characterise every system of good husbandry. One deep steam stirring at the right season is made to take the place of several slighter ones. Every year the work becomes easier, more manageable, and the days spent in tillage operations fewer.

Although no account has been kept upon this farm to measure the exact result of steam as against horse power in actual bulk of produce—and such an account for the reason that horse power and steam are used in conjunction is impossible—the owner of the farm is perfectly satisfied. His stackyard and his banking balance show a state of improvement that can only be attributed to the employment of steam.

F. R. S.

MY POTATO CROP.

BY A PRACTICAL FARMER.

Having to plant a rather large breadth of potatoes in the past spring, I resolved to take more especial notice of the growth of one particular crop, chiefly with the view of satisfying myself as to the comparative value of the different manures applied, and the various little deviations of management I had adopted. The field contains about nine acres; the soil an alluvial loam, upon a silty (old sea sand) subsoil. The preceding crop was wheat—a rather heavy one. Adjoining the field is a large public pond. This pond had not been cleaned out for the space of forty years; consequently the accumulations of one kind of matter or another was very considerable, and formed a deep stratum of what is denominated “pond mud.” With more courage than discretion, as I often thought whilst doing it, I undertook to lead out this mud, and to spread it over the surface of this field, which I did, at the rate of about forty loads the acre, except a portion on the east side, which was left uncovered. This was done immediately after harvest, and was laid upon the wheat stubbles, the wheat crop having been mown. During the winter I collected a large quantity of ditch roadings and the rich earth-mud from the cleansing out of a public drain. These I mixed slightly with foldyard dung and pond mud in a dung-heap, and in February turned all over, throwing over the turnings, as we proceeded, a good dressing of lime and salt mixed. This proved to be a valuable compost. I also purchased a quantity of Lawes’ super-phosphate, Peruvian guano, blood manure, and a popular manure from the west of England. The potatoes, imported from Scotland, were of the very best stocks; some from Renfrewshire, and the remaining from near Dunbar—all provincially here called Dunbar Regents. Those from Renfrewshire were as they were grown, except the chats. The Dunbar lot were good seed.

The ware having been taken away, the field was deeply ploughed in the early winter; in the early spring it was cultivated, and slightly but sufficiently worked by harrowing, &c., &c.; but owing to the unusually fine winter it was speedily in good order, having a fine deep mould, and being in the very best state which we like for ridging. We commenced ridging and planting in the early part of April, the ridges being 32 inches apart. On the east side of the field, where there was no pond mud, 23 rows were manured with twelve loads of very good fresh dung direct from the fold-yard, 8 cwt. of the lime and salt compost, and 3½ cwt. of Lawes’s superphosphate, per acre. The two latter dressings were sown by

hand along the open ridges, the potatoes (Scotch Regents) planted upon them at about 14 inches from set to set, and then the ridge was closed. (This was the course pursued throughout the field.) Next to these 23 rows we commenced manuring with the like quantity of good old and well-fermented fold-yard dung; this manuring was continued throughout the field. The 92 rows next to these 23 rows had the same dressing of compost and superphosphate per acre, and pond mud. Next to these 92 rows were 16 rows having a dressing of 3½ cwt. of Peruvian guano (Lawes’s selection), and in the remainder of the 44 rows of Regents the dressing of 3½ cwt. was the west of England manure, all having the dressing of pond mud, and the like management.

My first noted observations were on the 12th of May. The 23 rows had not put in an appearance; the 92 rows exhibited the potato plant from end to end, and growing fast; the 16 rows (guanoed) only just coming up; the 44 rows, rather forward, but not equal to the 92 rows, the whole planting only occupying three days. On the west side of the field was an acre of Rock potatoes, but all manured alike. These at this date were not to be seen, and were last to come up. In a few days, the twenty-three rows slowly and gradually came up, as did also the Rocks; but they continued in the same relative positions throughout the summer, except the “guanoed” part—*i.e.*, the sixteen-rows. These grew the slowest till the middle of July; they then began to show decided strength, owing, I thought, to more moisture from rains and dews; and ultimately they headed the field in haulm. Up to this time, the superphosphate ninety-two rows had a decided lead, being more luxuriant. The whole crop was thrice horse-hoed and twice moulded up. It progressed most satisfactorily throughout, and appeared the most promising crop in the neighbourhood. Its general appearance was so full and fine as to call forth the commendations of every passer-by. On the 5th of August, symptoms of “the potato disease” began to manifest itself. The copious rains in the early part of harvest caused it to spread fast. The field adjoins one occupied by a small farmer, whose custom it has been for years to cut off the tops on the first appearance of the disease, and with very good results. I resolved to try the like course with some rows at several and separate distances. These had the tops—*i.e.*, the haulm—cut off in their greenest state. The adjoining rows left untouched. In other places I had rows, cleared of the haulm, in a partially diseased state, and others when far advanced.

On September 30th we commenced harvesting the crop. I examined three rows adjoining each other, which had the haulm taken off when first attacked and green, the adjoining three rows which were left untouched, and other rows which were cut off when far advanced. I took up the potatoes at separate distances, along the rows, of twenty paces each, and counted them. The first on the three rows cut green averaged 231 good or sound tubers, and 126 diseased ditto. The uncut averaged, in the like distance, 165 good or sound tubers, and 199 diseased ditto. The rows cut when partially diseased averaged, in spaces as above, 211 good or sound tubers, and 171 diseased ditto. In another part of the field the haulm of one row was cut off in its greenest state: the adjoining rows left uncut. In the single row, also cut green, the twenty-pace intervals averaged 295 sound tubers, and 194 unsound. The uncut rows adjoining, in the like spaces, averaged 227 sound tubers and 196 unsound ones.

This little experiment may not be decidedly conclusive to many of my readers; but to myself, who watched it throughout, it was truly so. I have no hesitation in asserting that if our crops were immediately denuded of the haulm upon the first appearance of the disease much good would result, and their safety would be further aided by remoulding up. In accounting for the less number of tubers in the uncut or totally decayed rows, I would say that many were found quite rotten. It may be observed that the disease was very bad throughout the field, averaging, according to experiment as above, 227 sound to 196 unsound—a sorry average of bad ones. The sound and unsound would together have made a good crop, perhaps averaging twelve tons per acre; as it is, I could observe that the mild or looser loam of the field yielded a larger proportion of sound tubers than the stiffer or close loamy parts, and the richer the soil and dressing the greater the loss. It is well worthy of remark, too, that the tubers in the early cut rows were fully equal, if not larger in size, than the uncut rows. Certainly the disease spread very rapidly. There was not much time to cause any great difference, but that difference is in favour of the early topping. On the west side of the field, planted with Rock potatoes, scarcely any unsound tubers

were found, and the crop very good. Does not this indicate that the better the quality of tubers the greater is the liability to disease? I know this is so in a turnip crop in severe frosts: still it is by no means a certain indication. Fluke potatoes, for instance, possess most superior quality, and yet in this season scarcely any tubers are diseased. Rocks and Flukes are this season the freest of all kinds from the "disease," and both are yielding good crops.

In another field of ten acres, all Rocks, I adopted the like management, except that I used "Blood" manure in preference to the "West of England" manure; but I found that, good as its quality was, it did not equal Lawes' Superphosphate or guano. The superphosphate dressing forced the potatoes first into growth; the West of England manure second; guano third; and the blood manure last; and others of my experiment about an average.

On July 2nd I examined my experimental rows; *i. e.*, 16 rows, ten loads old muck, $3\frac{1}{2}$ cwt. super-phosphate, and 8 cwt. compost throughout—good average. Six rows, no manure, but like artificials as the 16 rows—defective. Thirty-three rows, 10 loads old muck, and same artificials—a good average. Fifty-six rows, 10 loads fresh dung and the same artificials—not equal to the above. Twenty-five rows, 10 loads of fresh dung, and same weight of West of England manure—not an average. Thirty-nine rows, 10 loads ditto, and $3\frac{1}{2}$ cwt. guano—second-best in the field. Twelve rows, 10 loads as before West of England (best), 12 ditto as before, and home compost—average. Twelve rows, 10 loads as before of blood manure—about an average. The remainder of the field blood manure, &c.

August 2nd, again examined the field, and estimated the progress of the various rows: The 16 rows better than the 6 rows; the 33 rows better, than the 6 rows, and equal to the 16 rows; the 56 rows better still than either; the 25 rows not equal to the 56 rows; the 34 rows best in the field; the 12 rows second-best; the next 12 rows not so good; and the remainder of the field, all blood-manure dressing as above, about an average.

In harvesting the crop we found that each of the above estimates was fairly borne out. The crop was a good average one, of superior quality, and nearly free from disease.

CHEMISTRY OF BRICK MAKING.

Brick and tile manufacture embraces two processes—the one chemical and the other mechanical. In a former paper we offered a few desultory observations on the latter, and in this we purpose investigating some of the more important details of the former, confining our enquiry chiefly to the quality of the clay, and the chemical processes involved during kneading, moulding, drying, and burning. The object of our remarks being to stimulate progress, we shall, as in the former case ("Mechanical Brickmaking"), purposely avoid noticing or making any reference to any one's peculiar invention or patent process.

There is at the present time an immense amount of rubbish being used up in building that hardly deserves the name of "brick." By means of plastering on the inside and a selection of bricks having unbroken faces on the outside (and in some first and second-rate buildings facing-bricks outside), a passing appearance is given to the whole fabric; but when closely examined, what a ginger-bread concern it is! How short is the period of its duration! How expensive to keep in repair! And how unhealthy and unsatisfactory to the occupier, let him be landlord or tenant! As for bonding the wall, the bricks are worse than useless; so that walls built wholly of them may be said to be without any bond whatever, and therefore ready to split up the middle; and as the outside bricks absorb moisture to excess, they consequently swell and

contract during severe frosty weather and sudden thaws, so that the ultimatum may be more easily imagined than described. Add to this the bad mortar with which such rubbish is too frequently built, and the reader will readily perceive the chemical rationale why such buildings crumble so soon into ruin.

The so-called "practical men," who manufacture and use such rubbish, are never at a loss for an excuse for doing so. But what is its value in the vast majority of cases? We have even heard the latter defend himself by saying, "The sooner the rickety buildings made of his bricks crumble into dust, the better for the trade!" But is not the very contrary of this short-sighted and selfish policy manifestly the rule? Because a few isolated individuals may knock fortunes out of the exception, by a system of jobbing—anything but creditable to themselves and the trade, professionally and scientifically speaking—does that make it the rule?

It would be almost superfluous to say that the most durable bricks are absolutely required for agricultural buildings, along with the best quality of mortar. And the same may be said of roofing-tiles and draining tiles. In practice, the prevailing difficulty lies in convincing both the landowner and tenant what a durable brick really means, when any sort of rubbish can be had for less money. In such cases the schoolmaster abroad is evidently much needed; but even then the battle be-

tween hard cash and chemical philosophy would have to be fought on what may be termed "very doubtful ground." Hence the upshot.

The practical question in the march of chemical progress hinges upon the very little that is often required to make a very bad brick a good one in the manufacture. A landowner, for example, has a brickfield which produces a very inferior article; but by proper machinery for washing and removing grit (small stones and shells), and by the addition of a small quantity of marl, chalk, or lime from a different part of his estate, it would turn out a very superior and most durable brick and drain tile. And this is not all, the more interesting part of the story having to be told; for this latter durable brick would cost him actually less money out of pocket than the former—the inferior, gritty, crumbling one—owing to the command of water and marl, chalk, or lime upon the property. In other cases, where the water for washing, and marl &c. for mixing, have to be brought from a distance, there might be some extra money out of pocket for the improved article, but not nearly so much as is generally calculated; while it is still further below the additional value thus added to the produce of the brickfield.

To those practically acquainted with the details of brick manufacture, the *rationale* of the above conclusions as to cheaper bricks will appear manifest; but to those otherwise experienced it may not be out of place to add that it costs more to make the inferior brick from the bad materials than the durable brick from the good materials; and this extra expense is experienced both in the mechanical and chemical processes—*i. e.*, both in the kneading, tempering, moulding, and drying for the kiln, and also in the burning; while there is a heavy loss of unsaleable refuse in waste, broken rubbish in the former case, but comparatively none in the latter—the whole being readily purchased or used up—to say nothing of how the intrinsic value of the two articles are affected by the improvement.

Much has been said in books about the proper percentage of alumina, sand, and marl, or other material, as lime, &c., acting as a flux, so as to produce a close weatherproof durable brick; but in practice "the rule of thumb" is yet in the majority of cases the most reliable one, owing to the impracticability of determining these percentages, or ever attaining to their near approximation. In other words, an intelligent experienced brickmaker knows better how to mix and temper his clay by observation, than by a chemical analysis, owing to the different substances present in the clay, besides those specified, and the peculiar function they perform in the burning; and also often owing to the stratified character of the clay both before and after washing. The texture of the clay as to its fineness or coarseness of grain also affects the percentages in question, and likewise the degree of moisture necessary to the proper moulding, drying, and burning of the brick. In practice all these things must be carefully taken into consideration; but in books it is hardly possible to give them a hearing.

In the brickfield, therefore, the initiatory step in improving the quality of the clay is to try experiments in washing and mixing it with the best and readiest flux materials at command, such as marl, chalk, or lime. At first, the colour of the clay may deceive the eye as to the percentage of iron which it contains; but an experienced burner, when he sees the bricks coming out of the kiln, will be at no loss as to how far his experiment has been successful, and what additions the clay may require to bring it up to the required standard; and however laborious the work may be—however fruitful in disappointments when the manufacturer is only but a beginner—however trying to the patience it may prove, the work of progress should nevertheless be persevered in; for, when once the grand desideratum sought is gained, the result at all hands during the future is more money and less labour, and a higher degree of professional credit and trade: in other words, it is simply the difference between a good and a bad brick, and their respective consequences.

The next topic for consideration is the texture of the clay as to its fineness or coarseness of grain, and the percentage of water it should contain when ready for moulding. The practical question at issue is a very nice and important one, and has been keenly canvassed both in books and in the brickfield; but, as in the previous case, scientific deductions are of difficult application, in consequence of some clays requiring

more water than others, owing to differences partly in the fineness of the grain, and partly in the other substances of which kneaded clay is composed. Hence the practical man has no alternative left but to fall back upon his experience and skill, as forming the safest rule. And the experience of every successful hand-moulder of bricks informs him that the proper kneading and tempering of the clay in other respects has more to do with the moulding process and quality of the brick produced than the mere percentage of water which it contains; and the conclusion doubtless applies with equal force to machine-moulding.

In a scientific sense, the chemistry of these several processes of mixing, kneading, tempering, and moulding the clay is not more than sufficiently well understood to be practically useful, if so much. This chiefly arises, perhaps, from the scientific data involved being more of a mechanical nature than a chemical, such as the adhesion and cohesion of particles together. Practically speaking, the proper weathering, mixing, kneading, and tempering the clay, gives it a degree of toughness which it did not previously possess. Why? Because the particles, solid and liquid, are brought into contact in a manner so as to allow a more uniform application of the force of cohesion, attraction, and chemical affinity that naturally exists between them, and also of the compression of the atmosphere, than when these forces are counteracted by that of gravitation towards the centre of the earth. The particles forming a sandstone, for example, may be wholly held together by the force of cohesion, almost to the exclusion of chemical affinity, analogous to the particles of iron forming a bar of that metal. But in preparing the clay and moulding a brick, less or more chemical affinity also exists, which is greatly increased in the burning, provided the clay has been properly mixed and tempered. There are thus two principal forces involved; but between these two forces science is yet unable to make any distinction that is of practical utility to the brickmaker: hence he is left to grope his way as experience guides his various manipulations in the processes in question. At the same time, he ought to bear in mind the existence and even imperative importance of these forces, more especially chemical affinity, chiefly effected by fluxes, with the view to the improvement of his manufacture.

Do percussive force in the kneading and moulding, and the allowing the clay to lie and weather, increase the force of chemical affinity? And does the compression of the newly-moulded brick afterwards increase both the cohesive attraction and chemical affinity of the materials of which it is made?

Much might be advanced in support of an affirmative answer to both these questions. This has already been done to a certain extent under the previous article, on the mechanical department of the work. The workmen, for example, are familiar with the fact that after the clay has been properly "weathered" during the previous winter, and a second time after the process of pugging and the work of kneading and moulding began, the more expeditious the several manipulations are performed, and the greater the amount of percussive force employed, the more successful the result of their labours. Beginners fail by turning out badly-tempered clay, and friable ill-formed bricks, because they go about the work so slowly, all the manipulations being performed in a hesitating, doubtful, and unworkmanlike manner. The moulder, who is dashing in the clay, and turning out his 5,000 bricks of the best quality daily, may hand a stranger his mould to try his luck; and if this stranger has never put his hand to the moulding before, the finale is bad bricks, and few of them. The difference is conspicuous enough. Hence the inference to be deduced from the facts of the case thus briefly premised.

In the chemistry of the process of drying there is perhaps less that requires special notice. Success mainly depends upon the uniformity of the process, so that one part of the brick shall not dry more rapidly than another. Water has a greater affinity for clay than sand, but if the two have been properly incorporated together little harm will be experienced. But if there are small stones or the like in the brick, or if these have been crushed and the broken dust not properly incorporated with the clay, then in both these cases the bricks will crack less or more in the drying. To the naked eye the cracks in many instances may not in the sun-dried brick be visible, but in the removal of the bricks from the kiln the cracks will make their appearance.

A great deal has been said about burning bricks, a great deal more in the same opinionative style might be added, but without advancing a single sentence to improve the work, simply because fire-side truisms cannot be heard in the brick-kilns. If the bricks have been properly prepared for the kiln they will be easily burned; but if otherwise, all the burning and other et ceteras usually advanced will not turn out a good manufacture. No doubt the heat should be equally distributed throughout the kiln, in order to make good work; and no doubt also to effect this is a grand desideratum, and in the majority of kilns this has been approximated, if not wholly attained. But the majority of kilns, nevertheless, do not turn out well-burnt bricks. And the reason is, because sufficient attention has not been paid to the chemistry of the previous processes already noticed, relative to the first weathering, mixing, pugging, and second weathering and moulding of the clay. The proper manufacture of bricks in these respects is highly conducive to the after-process of burning; while the *vice-versa* rule is equally in force, being adverse to the process of burn-

ing. No doubt to a few there is yet something very mysterious in the agency of fire, and therefore it is not surprising if they in a baffled hour lay all the blame upon this unknown agent for the badly-burnt bricks that come out of the kiln. But after all, man has not a more faithful servant than fire, or one that is more easily controlled in the brick-kiln, with a moderate degree of caution. The kiln itself is as seldom to blame for the bad quality of the bricks as the fire. Others give battle to the winds of heaven, because they won't allow the fire to burn and the kiln to draw equally. But in nine cases out of ten, is not this putting both common sense and patience into the frying-pan? The best method of filling the kiln is doubtless an important problem, but its practical solution is only a work of a few experiments. The successful burning of the brick is the true index to the progress made in the preceding manipulations of the work; and therefore whenever something wrong is indicated, the true plan is to go back and begin at the beginning.

LORD BURY ON THE CATTLE DISEASE.

At Norwich, Lord Bury said some information had come into his possession within the last two or three days of such importance that he felt it was only due to the committee to ask the Chairman's leave to bring it before the meeting. It was reported a short time since that the Dutch had been exceedingly successful in the cure of the rinderpest, and the homoeopathic body decided on sending out one of its most distinguished members to Holland to investigate the subject. Dr. Hamilton was the gentleman requested to go out, and he was furnished with a letter from Earl Russell to the Government of Holland. He started on his mission last month, and he was put in communication with the burgomaster of Schiedam, which was situated in the very centre of the district infected with the cattle-plague in Holland, and obtained from him the most authentic information. It was not only the homoeopathic method of treatment which had been exceedingly successful in Holland, but the allopathic method had been exceedingly successful also. The information which he was about to detail would prove most conclusively that the argument that the rinderpest was incurable was not to be sustained for a moment; and if the facts which he advanced could be proved—as he believed they could be—they would knock on the head the absurd system on which we had now entered of killing every beast as soon as it was attacked, without making an effort to save it. About the middle of August the Dutch Government became aware that the rinderpest had broken out in Holland. It first of all attacked a place near Rotterdam, called Kethel. It was distinctly traced to a cargo of cattle which had been sent from Rotterdam to the London market, which had remained ten days in London, and which had been sent back. On the appearance of the disease, the Dutch Government immediately drew a *cordon sanitaire* for a considerable distance round Kethel. Agents and sentries were appointed to watch all the roads, and to prevent any movement of stock outside the infected district, which contains about 250 square miles. The success of the *cordon* had been established by the fact that, while within it about 5,000 cases of the rinderpest had occurred, outside of it there had been only three cases. The Dutch Government was very particular in preventing the passage, not only of cattle, but also of dung, hay, straw, or anything which could be supposed to have come in contact with diseased cattle. As to the general treatment of the disease, it was the expressed opinion of the Dutch veterinary surgeons that it was highly contagious, that it was communicable by direct contact, and even by approaching within a wave of air with a radius of about 9 feet. They also said that they believed it had been communicated, not only by hay and straw which had been brought into contact with diseased animals, but even by birds which had settled on diseased animals.

Mr. Oldfield asked whether these remarks applied to cases of cattle only.

Lord Bury: Yes. Phenolic acid, which had been hitherto used as a means of preventing decomposition, had been found in Holland of the greatest use as a disinfectant. Many of the

veterinary surgeons in Holland believe that the disease was of a parasitic origin, and on that ground they tried phenic acid, and with considerable success. Holland was divided into 197 communes, and the Government appointed a veterinary surgeon to each commune. The veterinary surgeon of each commune had to account every week for the whole number of cattle within his district, having to state the number of cattle in it, the number attacked, the number dead, the number cured, so that the most accurate returns had thus been secured of the progress of the disease. There was one fact which he could not help bringing under notice, viz., that although the movement of stock was entirely prohibited from one part of Holland to the other, yet the export of unsound cattle from Rotterdam to the London market was still continued and was still sanctioned. In reference to the question put just now, he might state that no animals except horned cattle and those inoculated had taken the disease. It was found that animals treated in the open air yielded to the remedies applied much more readily than animals treated in sheds. The symptoms of the disease as they occurred in Holland correspond in every particular with the symptoms which were here described as being characteristic of the disease throughout England. Among the general preventive measures adopted, cow-sheds were carefully cleansed and washed with gas-tar, carbolic acid, and water. It was found necessary to be very careful with preparations of chlorine, as they affected the lungs of animals declared convalescent with respect to the rinderpest. Various other plans had been adopted in Holland. Creosote had been tried, but not with success; a stimulating treatment had been found to be injurious; and inoculations had been fatal in all cases. There had been treated altogether in Holland 4,700 cases of rinderpest, and of these 45 per cent. had been saved. This 45 per cent. included the results attained with experiments made by the homoeopaths; the latter dealt with a small number of beasts only, but they saved 75 per cent. of those which they treated. There were 197 communes in Holland, and of these 71 were affected by the disease. All of them were enclosed within the *cordon sanitaire*, and on the 22nd of October twenty-five of these communes were pronounced to be again free from disease. The total number of animals attacked up to October 21, 1865, which was the latest return he had seen, was 4,798; of these 1,031 were killed, leaving 3,767, which were treated either by the allopathic or the homoeopathic system of medicine. Of these 3,767 animals 1,276 were cured and 1,671 died, leaving 790 at the date of the return under treatment. A considerable number of these 790 must have recovered, because the official statistics to which Dr. Hamilton had access stated the proportion cured to be 45 per cent. This return included the commune treated homoeopathically, in which 72 per cent. of the animals treated were cured, subsequent returns bringing the proportion up to 75 per cent. The ordinary (allopathic) method of treatment had been most simple. The practice had been to dilute muriatic acid combined with linseed

tea in one or one and a-half drachm doses, giving frequently as much as five drachms per day, sometimes combined with gentian, tormentilla, and ginger. It had also been customary to dilute sulphuric acid, combined with sulphate of quinine in equal parts. These were the principal allopathic remedies, and they saved 45 per cent. The external use of phenic (carbolic) acid, in the proportion of eighteen drachms of the acid to forty quarts of water, had also been adopted, the eyes, nose, &c., being washed with the mixture three or four times per day. Vinegar and tepid water had also been used. The external use of carbolic acid as a prophylactic had been attended with advantage. Rules of diet were very carefully observed, and the feeding of beasts with distillers' grains and refuse was prohibited by the Government, because it was found that it predisposed sound cattle to attack, while those which were attacked were invariably carried off more easily. From the great soreness of the lips and mouth it was most difficult for an affected animal to eat, and it was found necessary to place food, consisting of small quantities of hay and oilcake, far into the mouth by hand, by which means the vital powers were sustained during an attack. He now came to the homoeopathic mode of treatment. He thought he should be able to change the smile which he observed into a look of admiration before he had done. The details which he was about to state were offered by the homoeopathic body to the Royal Commission just before their last sitting, and it was generally understood that the lay members of the commission were anxious to enter into them. No doubt, however, the commissioners had heard a vast amount of twaddle in the course of their inquiry, and the medical members of the commission, whose time was worth five or six guineas an hour, felt indisposed to enter into details of treatment with which, *prima facie*, they did not agree. He thought they were wrong in rejecting this evidence, because no one could say what it was worth without hearing it. As, however, the Royal Commission had decided not to examine Dr. Hamilton as a witness, it became the duty of every individual to give as much publicity as possible to the facts. In Berkshire, and in some parts of Scotland, the same course had been pursued, and the farmers and landowners were being put in possession of the facts by other means than examination before the Royal Commission. In September, when the cattle plague was raging in Holland, two Belgian gentlemen, M. Gandy, a member of the Veterinary College, Brussels, and M. Sentin, a homoeopathic chemist, offered to the Dutch Government that if a district were put under their charge, and they would not allow them to be interfered with, and would not require them to make a report until a sufficient number of cases had been treated, they would on their part give their services gratuitously, and try the system fairly. This was accepted by the Dutch Government, who agreed to give a commune up to the homoeopaths, it being understood that the veterinary surgeon of that commune should be required to certify that every case which came under homoeopathic treatment was an actual case of rinderpest. Matterness, the district assigned to the homoeopaths, was a commune situated in the very centre of the infected district. The peasants and proprietors were somewhat prejudiced against the homoeopathic system in the first instance, and did not enter cordially into

the views of the homoeopaths; but before the termination of the experiment they were greatly pleased with it, and gave every assistance in their power. At the commencement of the experiment the proportion of cures effected out of the animals attacked was 70 per cent., but in the latter weeks the homoeopaths saved nine out of every ten cattle which came under their treatment. Matterness was situated within a mile of Kethel, in the very centre of what had come to be styled the "black district," so that the homoeopaths did not enter upon their task under peculiarly favourable circumstances. They commenced it September 22, and eighty beasts came under their care, each case being certified by the veterinary surgeon as one of actual rinderpest. Of these eighty animals sixty recovered and twenty died. Besides these, 230 beasts in the commune were put under prophylactic homoeopathic treatment; twenty-five took the disease before the treatment had had time to work, but in the fourth week no fresh case had occurred, and on the 21st of October the commune was pronounced free from disease, and had remained free from that time to the present. A large proportion of the cattle attacked in the commune of Matterness had been treated by the allopaths before the homoeopaths came into the district. In all, 189 cases came under treatment, eighty under the homoeopathic system, and 109 under the other. As seventy-three cures only were effected, of which sixty were attributed in an official report to the homoeopaths, the balance was largely in favour of the homoeopathic mode of treatment. To the seventy-three cured ought, however, to be added a portion of those still reported as under treatment, as some of them no doubt recovered. The remedies which were employed by the homoeopaths were arsenicum, phosphorus, phosphoric acid, rhus tox., and sulphur. It was found that all cattle could not be treated alike, as every case had to be dealt with on its own merits. Mere details proved, he thought, that the disease was amenable to treatment, and that our plan of knocking on the head every animal which happened to be attacked was barbarous and unwise. He observed by the Privy Council return, published in the *Times* of Friday, that only four per cent. of the animals attacked in England had recovered; and when they thought of the vast amount of property which was sacrificed by an ordinance which he could not but consider most tyrannical and unjust, as it ordered a man who had the misfortune to have a beast attacked to kill it without remuneration, the farmers of Norfolk would hardly be inclined to allow such a state of things to continue if they could help it. The homoeopathic body felt that the statistics which he had quoted were of no use unless they were brought to some practical result; and if a veterinary surgeon were allowed to certify that each case assigned to them was one of rinderpest before they treated it, and if they had a sufficient number of cases to enable them to make a fair average, they would undertake that a competent veterinary surgeon should come to take the case in hand, and a leading firm of homoeopathic chemists had also agreed to give the necessary medicines free of cost. All this might, perhaps, be called empiricism, quackery, and nonsense; but if the farmers of Norfolk would only look into the facts of the case, he thought it would be satisfactory for the county and for their own pockets.

THE BEST METHOD OF TREATING LAMBS AFTER WEANING TIME.

At a meeting of the members of the Kelso Farmers' Club lately held, Mr. Purves, Linton Burnfoot, presiding, and with a full attendance, a discussion took place on the question, "What is the best method of treating lambs after weaning time?"

Mr. MUNRO, who introduced the subject, said—In engaging last month to introduce the subject for discussion, I was well aware that I had no new practice to advocate or wonderful discovery to promulgate, but I did it rather with the view of merely commencing the discussion, for undertaking which duty there seemed to be some difficulty in getting any one to volunteer, and thereby throwing all the trouble on our permanent Chairman. Therefore I hope I shall be excused if I only go over ground well known to all the members of this Club,

The subject for discussion suggested last month by Mr. Wotherpoon was, "The best method of keeping lambs from the time of weaning to the time they are put on turnips." This, you all know, is a critical time to our lambs, as by mismanagement a great loss may be sustained. If they get a check at this time, it takes a long period and a good deal of feeding before they recover the lost ground; and if kept on unsuitable food, death may cause a serious diminution of their numbers. So far as my observation goes, almost the only plan to take with them is to give them a change to a fresh pasture, and, if possible, to young grass, and to watch them carefully, so as to mark in its early stages any tendency to purging, which, if allowed to go on, if it does not kill them, reduces them rapidly in condition. On purging being noticed, the lambs should be removed, if on

young grass, to a clean field of older grass, and *vice versa*. I do not think anything further can be done, though sometimes benefit follows the administration of oil and laudanum, or an occasional feed of corn, if they can be induced to eat it. This year I have lost a few by a disease which has much the appearance of quarter-ill, when the discoloration does not come to the outside. It is not the lambs that are purged that are thus affected. They are carried off rapidly. After taking off the skin, the flesh appears sound enough; but when cut into, it is quite black, especially the hind quarters. This, I have no doubt, is brought on by the rapid growth of grass forced forward by the warm weather following the rain we had at the beginning of harvest. In trying to show how this change of pasturage of lambs may be most easily effected, the different circumstances under which farms are managed must be taken into account. The different systems may be divided generally into three classes. 1st, Those farms on which merely the stock of grey sheep bought in yearly, say at St. Boswell's Fair, and which are sold off nearly altogether before another lot is purchased; 2nd, Those on which a full stock of ewes are kept, and merely the ewe lambs to renew the flock; and 3rd, Those keeping a stock of breeding ewes, and also their own lambs. With regard to the first, they have the least trouble in finding food suitable for the young stock. The greater part of their last year's purchase will have been sent to market before the season again comes round, when they have to buy in for another winter. Their fields will be clean, and not overgrown with aftermath. The lambs should do well at once, any weakly ones or cases of scouring being removed to the hay field, and after harvest to the stubbles. Those who follow the second system of farming have rather more difficulty in carrying their lambs from weaning to turnips. Their fields, from the time that the lambs are sold off, are very lightly stocked, and the foggage is ready. After that is consumed, the barley stubbles are available, and the longer the lambs are kept going forward on grass there is not only a saving of turnips, but they do not so soon lose their teeth, and are able to break the turnips for themselves to a later period in spring. Under the third system, the greatest difficulty is found in keeping the lambs thriving, as the same stock is on the lands that has been there all summer. The best plan, I think, is to take grain sown down without a crop or a foggage after hay in addition to the farmer's own. If these cannot be procured, a hill grazing may be taken for a few weeks, which, although it may not put much condition on the lambs, gives at least clean food in the mean time, and allows the grass on which they have been weaned to clean and freshen. Another plan that might be tried on farms with small fields is to teach the lambs to eat eke before they are weaned. This might, I think, be done (although I never saw it tried), by allowing the ewes to come to boxes at first, and then gradually and quietly keeping them back. The quantity allowed to lambs would require to be increased after weaning. A fourth class might also be made from those who sell part of their lambs, and feed a considerable number; but their management cannot differ in any degree from that of other classes, with slight modifications to suit varied circumstances.

The CHAIRMAN said the management of lambs was one of the most difficult things they had to deal with, and there were more deaths at the early age of weaning time than all the rest of the time a sheep lived. His opinion was that sheep stock bred on whinstone should be put on red freestone, heavy clay, or limestone. If they remained on the farm on which they were bred, they would go to wreck and ruin. After about a month or six weeks they came home to their regular pastures in a good healthy condition, resulting from the change. He considered also that giving the lambs a supply of eke was a very excellent thing. They should be taught to eat it when early lambed—a week after birth in fact—which would make them eat it after they were weaned, and which would improve them a hundred per cent. A person who kept all his lambs was often in a difficulty to find food for them after they came home from the summering. This year, he (the Chairman) had tried another plan. He had some twenty acres of tares, upon which he put his lambs, and they soon took to the eating of them out of the ricks. This was the first year he had tried them, and in a year like this, when they had a superabundance of grass, tares were far more preferable than heavy clover. With this kind of feeding, out of 23 scores he had this season only one lamb dead. If they

could only keep the rush from their lambs, they would go on well, but with it they went fast to ruin. He would advise those who had farms of 500 acres to sow about 20 acres of tares for the use of their lambs. Such had been his experience this year, and he intended to carry it on.

Mr. SIMON, Courthill, said the best plan was to learn the lambs to eat eke early, and after they had been weaned to give them a mixture of eorn and tares, the latter being eaten from hecks. He disapproved of sending them away to other pastures; his practice was to keep them on the same land. This year, he had as good young grass as could be desired, yet he had been losing them right and left.

The CHAIRMAN remarked that last year he had got a quarter of winter tares, which were sown in October on three acres of ground, and turned out a splendid crop, one-half of them being cut twice, and the second-cutting proved better than the first. The first cutting, he might mention, took place about the end of May.

Mr. ROBERTSON, Jun., Ladyrig, said that on the whole he agreed with the remarks of the Chairman. Upon the farm of Ladyrig there had been no deaths among lambs to speak of this year, but those that did occur he attributed to the overgrowth of grass proving too strong. They usually put their lambs on foggage for some hours a-day. After the foggage was done they were turned out to stubble. The symptoms of the disease which had proved so fatal among their lambs were nearly the same as those described by Mr. Munro. Some of them had a slight rush, and some of them had none. They died very soon after being taken ill, sometimes in less than an hour, and swelled after death to an immense extent. He had lately caused the shepherd to put a piece of roek salt into each field, and since then no deaths had taken place; but whether the salt had been the means of stopping the mortality he was not prepared to say.

Mr. BURN (Ednam West Mains) differed a little from the opinions expressed by the Chairman. He knew that people sent away their lambs, and succeeded in saving a great many lives; but at the same time it might be questioned if they gained much by sending them away, because they lost a great deal in condition. For his part he preferred to keep his lambs at home, and he thought he could save their lives too. He thought it of great importance to teach them to eat eke at an early stage. If they could manage to allow the lambs but not the ewes, to get into another field than that in which they were pastured, and have eke placed in the field on which the lambs could feed without the mothers getting at it—he did not think it beneficial that the ewes should get eke—it would be an excellent way of getting them to eat it early. He was also in favour of putting lambs early on turnips; but whenever they intended to change their kind of food, they should always do so by degrees—always, as it were, preparing them some time beforehand for what they were coming to. Mr. Burn then mentioned that he had a great many deaths among his hogs, sometimes at the rate of one per day. They were sometimes found dead in the morning just as if they were sleeping; and he found that soon after death they had a dreadful smell, so bad, in fact, that he would never think of having them skinned, since any one merely touching them with his finger could not get quit of the smell for a whole day. As to their colour, the flesh was soon as black as his hat. He thought it was something like the black spall in cattle. He thought it was good for them to change them from one field to another, and when changing their food to do so gradually.

EARLY MILKING.—Cows should be milked early in the morning, so that they can feed on the dewy grass. Two hours of such feed is worth as much as that of the rest of the day towards giving a good flow of milk. So wake up, boys, at father's rap on the partition wall, and hie to the yard with pail in hand, and have the cows in pasture before anybody's else. Be sure and milk clean. A boy who will always milk clean will have a good recommendation of being faithful wherever he goes, and such a recommendation always goes a great way among business men.—*Maine Farmer.*

THE CATTLE PLAGUE.—THE GOVERNMENT AND THE VETERINARY SURGEONS.

The discussion over the cattle-plague would now seem to centre over the consideration of two certainly very material points—Should the outside world, the general public, or the agricultural interest fall foul of the Government or the veterinary profession? Upon more mature reflection, however, it will be found impossible to separate these two subjects, as the Administration has simply done as the veterinarians directed. If wholesale slaughter has been countenanced—if the utter abnegation of the old English principle that every man's house is his castle has been admitted of, so much has been sanctioned rather at the instance of a veterinary professor than by the order of a Home Secretary. No one can say but that her Majesty's Ministers have shown themselves really alive to the necessity for action. Instructions are being continually issued. Commissions of inquiry have been instituted, and the most practical of prohibitive measures have been enforced. And yet, at the meeting of the Farmers' Club, the tone of the debate evinced an inclination to disparage the Government at the same time that it upheld the veterinary profession! Thus Mr. Charles Howard, who read the opening paper, clearly sympathized with the cattle doctors, and "the most unfair" manner in which these gentlemen have been treated in certain quarters; while any remedy not proceeding from the profession must emanate from "a quack," who has vinegar, carbolic acid, or gypsum to sell; as due allowance must be made for the "proclivities" of the homeopathsists. Professor Simonds, who was present, took up this wondrous tale, for "it was a most extraordinary thing that farmers and shepherds should set up their opinions on this question against those of the veterinary profession;" or again, "we see men who know nothing about medicine, and do not perhaps even know the names of the organs in the animal's body, setting up their notions as to the curability of this disease against ours." The learned Professor characterized all this as "amusing;" but there was a certain irritability of voice and gesture associated with the expression that scarcely realized the phrase in its primitive sense. Let us, though, look a little closer into this matter. What do the Professors and their disciples know more of the cattle plague than the farmers and shepherds and other outsiders who cannot tell you even the names of the organs in an animal's body? *Nothing*. What have they done more than we could have done for ourselves? *Nothing*. Assume that so far we had been living in a kind of Golden Age, in a modern Arcadia, as it might be where veterinarians were unknown, and that this terrible plague had broken out amongst our herds. How in our ignorance and utter imbecility should we have acted of our own accord but as these veterinarians now advise us to do? Should we not have drawn cordons round infected districts, and have slaughtered forthwith every suspected beast so reported? Or, even as to symptoms and premonitory signs, are not farmers and shepherds, and people who do not know the names of organs, often to be trusted as much or more than many of the duly qualified practitioners? There can scarcely be a reader of this paper, but who could cite cases of animals which have been condemned upon authority as having the rinderpest when they had nothing of the sort, as others after examination have been suffered to go at large with the seeds of the disease gradually if not rapidly developing. The veterinarians declare, in point

of fact, in so many words, that they can do nothing; and if accordingly the malady is to be stamped out, if hecatombs are to be offered and homesteads to be invaded, it is not so much the Government as the profession which must be made answerable. Still Mr. Simonds has preceded to support him; for, as he tells us, it is not only the plague in animals, but typhus, cholera, and small-pox in the human frame are equally incurable. A hundred years since, or in an assemblage of savages, a man might have declared the small-pox incurable, but such a doctrine will not do in these days; and if cholera or small-pox can be successfully treated, so surely may the rinderpest. Mr. Howard almost sneers at the homeopathist, as he does more directly at the quack who has something to sell, and we do hope that we have as great an objection to pulling pretenders as most men, but how stands the case? What have the veterinarians to sell here? *Nothing*; neither knowledge nor drugs. Then surely we are justified in looking to some other quarter, remembering as we must that some of our greatest discoveries, some of our most valuable improvements, have been made by men who might not know the technical terms for the very instruments they were employing. Professor Simonds informs us somewhat magnanimously "what *we* are going to do"; and that is "we are going to let the homeopathists have a trial." We should rather think *we* were, too, after all Lord Bury has said as to the cures that had been effected in Holland. It may be all very well for Mr. Smallbones, Colonel de Butts, or other gentlemen residing abroad, to sit down in despair when the plague makes a visitation upon them; but that is surely no reason why we here in England should continue hand-tied. If the Government will deserve censure hereafter, it will be for putting too much reliance upon an agency that has no power. Veterinary science has had ample scope and opportunity, and now let us, if anything, rather go out of the way to give the other professors a chance. Let it be not merely the homeopathist whose prescription shall be put to the test; but let every one who thinks he can do good be called upon, even if the remedy be made to depend upon what, as Mr. Howard has it, he may have to sell, whether vinegar, carbolic acid, or brandy-and-water. A greater part of the evening at the new Club House was spent in tracing the plague to foreign parts, and Professor Simonds certainly worked out this theory with much tact and ability, but still without any direct evidence whatever from facts. We do not care to dispute the deduction, but in a remarkably sickly season it would have been curious if cattle had escaped. Some of the most fatal disorders have appeared amongst the human race; wild animals, like hares and rabbits, have been found dead by the score and the hundred, and horses and sheep have been struck down with what is declared to be not the rinderpest. If hares and rabbits were as valuable as cows and oxen, we might proceed more elaborately to trace the origin of their ills; but, as it is, we are content to put them down to the sickly season.

Beyond the lengthy addresses of Messrs. Howard and Simonds, there was little or nothing in the Club debate that can provoke much profitable comment; and, as taking the question from a farmer's point of view, the business of the evening will by no means compare, for useful results, with many a previous meeting of the same society. The report, however, which we give in full, can

now be pointed by that emanating from the Royal Commissioners, as published on Saturday. We gave the substance of this document when we stated some time since that it would "recommend the adoption of the most stringent steps to guard against contagion. Fairs, markets, shows, and auctions are for the time to be abandoned, as the transit of beasts, save under certain restrictions, will be interdicted, and beef rather than cattle be the commodity in which salesmen must deal. It is rumoured, moreover, that the several clauses, as carried, are worded so strongly that the agricultural element on the Commission withdrew from a division in which they were so continually in a minority, and that the scientific men have here again pressed in their point as to stamping out the disease being the only effectual way of subduing it. The evidence, to be sure, went much the same way, and agriculturists from the east and the midland counties, gentlemen whose names carry weight with them, have expressed themselves as strongly as the Commissioners, who can turn to such testimony in support of the conclusions at which they have arrived." At the head of the dissentients we find the agricultural

element, as represented by Lord Spencer, the President of the Smithfield Club, and Mr. Sewell Read, the Member for Norfolk, who, with Lord Cranbourne, and Mr. Bence Jones, have issued a separate Report of their own, *against* the total stoppage of all movement of cattle. The Report of the majority runs to great length, as in fact it is too wordy; while a deal of space is occupied in tracing the origin of the disease. The Commissioners here go over much the same ground that Professor Simonds did at the Farmers' Club, while these gentlemen are fair to admit that this history is but a theory at best:—"The facts, though by no means inconsistent with the theory which attributes the appearance of the plague in England to the Revel cargo, fall far short of establishing that theory, unless we assume that the event cannot possibly be accounted for in any other way. Further inquiry may throw new light on the question. At present we are not able to pronounce a decided opinion on it; nor, for the practical conclusions which we are about to offer, is it material on which side the truth lies." We thoroughly agree with this deduction; and for the future it will be well to keep a little closer to what really is *material*.

CENTRAL FARMERS' CLUB.

THE CATTLE PLAGUE.

The first meeting of the Club, after the usual autumnal recess, took place on Monday evening, November 6, in the dining hall of the Salisbury Hotel, where there was a large attendance, amounting to more than 100 members, drawn together by the importance of the topic, namely, the cattle plague, now raging throughout the country. The subject fixed for consideration in the programme for the year was that of benefit societies; but, in compliance with the wish of the committee, Mr. Chas. Howard consented to substitute for it the question which has recently absorbed the attention of farmers and graziers.

Mr. ROBERT LEEDS (West Lexham, Norfolk) the chairman for the year, presided, and, in opening the proceedings, said, "In welcoming you to our new home I am only sorry we do not hold our first meeting here under more encouraging auspices. It has been usual, I believe, for your Chairman on the occasion of our re-assembling to say a word or two on the past harvest, while all I can tell you is that in my own county of Norfolk, it has been the worst either for wheat or barley that I have known for many years, more especially on the mixed and light soils. But this, gentlemen, is not our only difficulty, for we are assembled here to-night to consider one of yet more pressing importance, and of which we have also known the effects in the East. I may say that the Committee have long felt the necessity of taking this matter up, but knowing the difficulty of getting farmers to London earlier it was thought better to postpone the question until the November meeting. As you are aware, the name of Mr. Charles Howard stood upon the card associated with another subject, and I am sure that gentleman deserves the best thanks of us all for the readiness with which, at much personal inconvenience, he fell in with our wishes, and agreed to take up instead a topic of so much national importance. I shall in no way attempt to anticipate Mr. Howard's paper, or to refer here to what has been done by the Government or other societies. But having, as I had expected, a very large meeting, and many gentlemen having no doubt something to say, I would urge the necessity of these remarks being put as

concisely as possible. It would perhaps be better indeed that I mention two or three of the chief rules of these discussion meetings, which are as follows:—"That none but members of the Club address the meeting except by special invitation."—"That the introducer of the subject have the right to reply, but that no other member address the meeting more than once."—and, "That no one but the introducer of the subject occupy the time of the meeting for more than a quarter of an hour."

Mr. CHARLES HOWARD said: "Gentlemen, I must congratulate the club on the attendance of so numerous and influential a company as I see before me this evening; and, indeed, had I known that I should have before me such a formidable assembly, I should perhaps have been more chary about giving my assent to introduce the subject which is now about to be discussed (cheers). I appear before you this evening as a farmer. I do not pretend to any great knowledge of the veterinary art, or to be possessed of more information on the subject for this evening's discussion than could have been acquired by any man of ordinary intelligence, who had read the newspapers and other publications of the last few months. I would say at the outset that I hope you have not come here to-night expecting to hear how to cure the cattle plague; this I am content to leave with those who have made it their especial study, my endeavour will be to treat the subject from a farmer's point of view. When it was intimated to me, about a month since, that the committee deemed it desirable that the Cattle Plague should be the subject for discussion at our first meeting, instead of that of Benefit Clubs, which I had undertaken to introduce, I entirely agreed with the opinion expressed, and at once wrote to our Secretary to suggest the names of gentlemen conversant with the subject, who should be solicited to take up the question. I believe these gentlemen were applied to, but without success; such being the case, and feeling the great importance of the matter to the farmers and graziers of England, as well as to every other class of the community, I could not refuse the request to bring this subject under the notice of the Club. It is my intention to sketch briefly the history and nature of the disease, to notice

its appearance in this country, and to remark upon the curative and remedial or preventive measures. It will be remembered that when the alarm note was sounded by the veterinary professors upon the appearance of the cattle plague in England it was treated very lightly, both by the public and the farmers, the opinion, in some quarters, being that it was an endeavour on the part of one or more of these veterinary gentlemen to write themselves into notice and place. Those, however, who were acquainted with the frightful ravages the disease had made in the herds of every country in which it had appeared, felt that the agricultural interest was about to be exposed to one of the greatest calamities that could overtake it. First, then, as to its nature and history. It appears that cattle plague, which differs not only in intensity but in kind, is no new disease: it was known, according to some authorities, as long ago as the third century. We read, also, of a grievous murrain in the time of Moses, whether akin to the present murrain or not we have no evidence. It has at various periods committed fearful havoc among the cattle of several countries on the continent and in more distant territories. It is stated, that from the year 1793 to 1795 it destroyed in Italy between three and four million animals, and in France, from 1713 to 1796 not less than ten millions. Upon the whole continent of Europe it is computed that some two hundred millions of cattle perished from cattle plague during the last century, and in more recent times in Russia one million have perished in a single year. In Egypt it was introduced in 1811, by the importation of foreign cattle, and in three years some 350,000 were destroyed. I learn also from my brother, who has lately visited that country, that in the year 1864 above one million head of cattle died there, so great was the mortality, that the Egyptian farmers, left without draught animals, were driven to mechanical appliances for the tillage of their soil; hence the large orders that were received in this country a year or two since for steam engines and steam ploughs. From the best veterinary authorities in our own country and on the continent we learn that the spontaneous development of rinderpest takes place only in the East: as, with cholera morbus, this appears to be its natural home. Various causes are assigned, such as the soil, climate, its peculiar vegetable products, and the breed and management of the cattle. I learn from some writers on the subject, that true rinderpest is simply malignant typhus fever; but that another kind or form of the murrain is typhoid fever, accompanied by inflammation of the lungs, or aggravated pleuro-pneumonia. Other varieties of the murrain are described, into which I do not propose to enter; what we have to do with is the type or form of the murrain now prevailing in the country, which is said to closely resemble, if not to be, typhoid fever. It is undoubtedly much more contagious than any known disease, either of man or animal: so much is this the case, that these same authorities consider it can be and has been carried from diseased to healthy cattle by dogs, sheep, goats, and even marching armies, while the soldiers and other animals have been unaffected by it. Some go so far as to maintain that flies even are carriers of the poison. As to the question whether sheep being brought into contact with diseased animals take the disease or not seems at present a disputed point. In my own neighbourhood, a number of sheep belonging to a friend of mine have been grazing in the same field in which were a number of badly diseased bullocks, and although they ate the food upon which the bullocks had breathed, and a portion of their saliva had fallen, up to the

present time no harm has befallen the sheep. It is therefore open to question whether, in the much discussed Norfolk case, the sheep were the victims of this dreadful scourge; upon this, however, we may hear more this evening. The disease does not develop itself for some days after coming into contact with diseased animals. As to the precise time, however, great difference of opinion exists: some say for from four to fourteen days, others to twenty-one days. It may be known from the following symptoms: Great dulness, frequent twitchings and shivering, staring coat, arched back, drooping head, with a mucous discharge from the nose, reddened eyes, with a watery discharge, quick and short breathing, ulcerated lips and roof of mouth, cessation of rumination, with diarrhoea or dysenteric purging; the animals rapidly sink, and die in from twelve hours to eight or ten days, in most instances the second day, after falling. The cattle plague first made its appearance in England in 1714, and remarkably enough, as in the present outbreak, the cows near London were its first victims. Various accounts are given of its introduction, but most agree that it was an importation. It raged with more or less virulence until 1757, when it ceased, after having destroyed many hundreds of thousands of cattle. Great alarm was felt then as now, Orders in Council prohibited the holding of fairs and markets, and ordered all beasts showing symptoms of the plague to be destroyed and buried. Various reasons were assigned for its appearance, pamphlets were published, some writers endeavoured to show, as in the present instance, that it was a visitation of Providence for the sins of the people. The famous Dr. Cullen tells us that it is a judgment of the Almighty for our gross superstition in cattle worship, or in other words, for the undue attention we bestow upon our animals. The celebrated Dr. Cumming, when at Bedford, the other day, expressed almost similar sentiments—sentiments, however, which will find no echo in a farmers' club. My own opinion is, that our animals have not had attention *enough*, particularly in their transit through the country, and their exposure to the vicissitudes of our climate when in the hands of the dealers. At the appearance of the cattle plague in England in the present year, conflicting opinions again arose as to whether it was an imported contagious disease or an epidemic, or, as the veterinary profession more properly express it, epizootic, spontaneously breaking out in the cowsheds of London. Many letters and articles, some of an angry character, appeared in the daily papers, with regard to one of these organs, which for many years led the public mind, and doubtless at times has swayed the Government, and to which England is indebted for the great ability it has brought to bear on public questions, its conduct towards our leading veterinary men I maintain was most unfair, because these gentlemen gave expression to an honest opinion that the disease was imported, no language was too severe to apply to them; if the section of the press to which I allude had prevailed upon the country and the Government that the plague was epizootic, it would have been all but useless for the Privy Council to have taken action in the matter. Had it been atmospheric, no precautionary measures would have availed in arresting the progress of the disease, it would long ere this have travelled from parish to parish, until the whole country would have become infected. On the other hand, numerous cases have happened in which prompt measures have sufficed to arrest and stamp out the disease in the locality. It was curious that the parties who came prominently forward to uphold the epidemic theory were

either interested in the cattle trade or were over-zealous supporters of the system by which foreign cattle are admitted; while, on the other hand, it was held to be a contagious disease—and that an *imported one*—by men of the highest standing in the veterinary profession. Latterly, however, the epidemic view has been dropped by the press; and, from the experience of the past few weeks, I think—to say nothing of the origin of the contagion—he would be a bold man indeed who would stand up and defend this theory. I am aware that statements have been put forth of spontaneous outbreaks; but well-authenticated proofs of spontaneous generation, as far as I know, are not forthcoming; on the other hand, however, we have cases without number where the disease is clearly traceable to contact with affected animals. To confine myself to my own district, I may state that in every instance the attacks can be traced to the introduction of diseased animals. The first case was through the purchase of London calves at Leighton Buzzard market; the next at Harlington, through the purchase of diseased bullocks at Newport Pagnell fair; another at Marston, where a diseased cow was driven through a lane, a hedge only parting it from some grazing bullocks—these immediately took the disease. Mr. Kilpin (a member of this club), the owner of the cattle, and who has lost thirty-three, occupies another farm (Bickerings Park) some three or four miles distant. The disease, in a few days, broke out there also; as no other reason can be given, the belief is that it was conveyed by the men who had been in attendance upon the diseased beasts at Marston. Another case occurred at Denn. Thirty Welsh runts were bought at Leicester fair, and, in a week after, fell with the disease, the last news I heard was that twenty-five had died. I learn also that others bought at the same fair had fallen and died in various parts of the country. I will only mention one other well-known case, which happened not far from my place. In August last, a large drove of Welsh and Irish beasts were taken to Newport Pagnell fair, several lots were sold, which went into different parts of the country, each lot is known to have infected the respective neighbourhoods to which they were taken. The unsold portion of these same cattle were driven to Barnet fair, and there sold into Hampshire; and I learn from a friend of mine that the whole died on their road home. I have this morning received a letter from Mr. C. S. Read, M.P., part of which I will read:

Honingham Thorpe, Norwich, Nov. 4, 1865.

My Dear Sir,—As the report of the Royal Committee has not yet, I believe, been presented to the Government, I do not wish to give my *opinion* as to the origin and nature of the disease, or suggest any measures for preventing its further spread. I will therefore confine my observations to a short record of the outbreak of the cattle plague in Norfolk. In the first week of July the plague broke out in three distinct and separate localities, which may be called Reepham, North Walsham, and Harleston. Certainly in the same week, and I believe on almost the same day, the plague appeared in these three districts, and all could be traced to foreign cattle, which were bought in the Metropolitan Market, and sent into Norfolk. From ignorance, carelessness, and selfishness, the disease spread like wild-fire, till the formation of the Cattle Plague Association for Norfolk; and the injunction on its members to refrain from purchasing stock in any markets for a period of six weeks, had a marked effect. However, the markets were not *closed* entirely against stock, and certain persons (not members of the association) purchased cattle, and several of them incurred most serious losses. Farmers resumed bringing cattle on the 23rd of September, and it is easy to trace the loss of 200 head of stock to the purchases of that day. I mean, of course, the cattle actually bought on that Saturday, and the cattle they infected on different farms. The losses are now becoming most serious, and there is no doubt that the disease is spreading in Norfolk to an alarming extent. The markets are now entirely closed throughout the county, yet dealers continue to congregate cattle and

hold sales just outside the walls of the city or town, and so little good has yet been realized. Everyone no doubt has heard of Mr. R. J. Harvey's most serious loss of cattle at Crown Point. When the cattle began to die, the sheep appeared to be also smitten with the plague, and I believe Mr. Harvey in six weeks lost 1,200 sheep. A lot of healthy hoggets were placed with a portion of Mr. Harvey's sheep, on some fresh ground, and three or four of those are dead, and two out of three that were placed with some sick bullocks, on another farm, have also taken the plague and died, as well as a goat, which ran about with the stock there.

CLARE SEWELL READ.

Since I have been in the hotel to-day, I have received a letter from a friend of mine—a gentleman who went to Hungary some years ago, to manage the vast estates of Prince Esterhazy. As I have not had time to peruse this letter, I have put it into the hands of my brother, who will, with the permission of the chairman, read it to you.

Mr. JAMES HOWARD here read the letter, as follows:

Deutsch-Krentz, Hungary, Nov. 2, 1865.

Dear Sir,—To attempt a description of the cattle plague, after the elaborate communications which have been laid before the public by Professor Simonds, would occupy much time, without throwing more light on the subject than has been already obtained from the able description of the Professor. There cannot exist a doubt as to the disease being, in the highest possible degree, infectious, and so extremely difficult of cure that hitherto, in this country, not only have the majority of cases proved fatal, but there have been many instances also in which from a whole stable of horned-cattle scarcely one has been saved. Under these circumstances, it is evident that the proprietors of horned-cattle will have to rely much more on the possibility of preventing the spreading of this disease, than on the problematical chances of effecting its cure; indeed, the question may very possibly arise, seeing the great risk that is run of the disease being rapidly propagated by the infection constantly emanating from the sick animals, whether it may not be advantageous, even in a pecuniary point of view, as it is in a sanitary point of view, to have each animal in which the disease distinctly shows itself destroyed at once, and thus diminish, to a great extent, the source from which the infection arises. Should the steam-bath treatment described by an Englishman residing in Russia, and transmitted by him through the Russian Embassy to England, reduce the losses in England, as it is reported to have done in Russia, to 6 per cent., or thereabouts, the solution of the above question would be, and that deservedly, in favour of attempting the cure. Whatever measures may be adopted as regards those animals already affected with the disease, whether in the absence of a more successful mode of treatment than has hitherto prevailed, they be destroyed at once, or whether under a more successful mode of treatment the risk incurred in retaining them to attempt their cure would be more than counterbalanced by the results obtained, it will nevertheless remain a point of the highest importance to cattle-proprietors to ascertain and adopt those measures by which the propagation of this fearful disease may be confined within the narrowest possible bounds. To effect this it is, amongst other things, absolutely necessary that not only a thorough separation of the diseased and even of the suspected animals from those that are still healthy be effected, but at the same time this separation must extend also to the servants employed to tend the said cattle, as it is well known that a servant going from a stable of diseased animals to a stable of perfectly healthy ones will be almost sure to convey the infection to the healthy animals: there have been only too-frequent proofs of this fact. On the other hand, we have also had repeated proof of the safety that has been derived from entire isolation of animals and servants. For instance, it has frequently happened that a large cattle-proprietor, on the approach of the disease, has closed his cattle-stalls, or rather the farm-yards in which they have been situated, permitting neither egress nor ingress of either person or animal; the animals being fed from fodder in the lofts above their stables, and the servants having their food handed to them through a window, thus cutting off all communication from without. This plan has been attended with success, even where the disease has been ravaging the whole neighbourhood around the yard thus isolated; but it must be strictly carried out. For cattle that are lying in fields of pasture, it would be well, on the approach of the disease, to fix stakes in the ground, at sufficient distances, so that one animal might be tethered to each stake, and thus each be kept at a sufficient distance from either of the others. By this means, also, the chances of the disease being propagated are much less than when the whole herd can huddle themselves together in one part of the field, as they generally do if left at liberty. In regard to the means of cure which have been adopted here, it

can merely be said that little good effect has hitherto been derived, consequently little reliance is placed in them. The cattle-proprietors here generally destroy those decidedly affected with the disease; separate those which, from their contiguity to the sick animals, are likely to have caught the infection, and either kill them at once, or immediately on one or two of them showing symptoms of the disease coming on, namely, before the meat has become unfit for food. By this means they are enabled to make something of them, and at the same time not infrequently prevent the disease extending beyond their own animals.

GEORGE B. SMALLBONES.

Mr. J. Howard added that Mr. Smallbones had had the management, he would not venture to say of how many hundred thousands of acres belonging to Prince Esterhazy, for a period of twenty years past.

Mr. C. HOWARD: I have also received a letter from Mr. Spooner since I have been here, together with one from Egypt. From the latter I find that the symptoms of the disease are different in Egypt from what they are in this country. My brother will be good enough to read the letter.

Mr. J. HOWARD: The gentleman who writes this letter is the manager of the Peninsular and Oriental Company's farms. He says:

Peninsular and Oriental Steam Navigation Company,
Cairo, Oct. 25th, 1865.

My Dear Sir,—I have the pleasure to acknowledge receipt of your letter of the 10th instant to hand to-day. The Egyptian cattle-plague appears fresh in your memory. I have been trying to forget it, for I suffered rather heavily. The following are the symptoms noticed by me: The cattle fastened up at night all right; found in the morning the provender had scarcely been touched, and the animals watering at the eyes and nose, the discharge gradually becoming thick and glutinous, and the white of the eyes turning to a deep red. The animals appeared very heavy, hanging their heads, and in a short time became quite prostrate, like a person in fever; and suffered at last with purging, which in a few hours carried them off. I had several opened, and found the gall bladder very much enlarged, and filled with very thin yellow matter, but could not discover any other part diseased. The change of air to Suez had not the desired effect, for all the oxen I sent there died. I dare say you remember a piece of berseem*, near the well on the farm. I put an ox at the one end, and a cow that was supplying our little one: with milk at the other. The ox died, after being out about four nights and days; but the cow escaped, and is still living. She is the only one I saved. It is the opinion of many of us Egyptians that the cattle disease, as also the cholera, travels in the air. Possibly you English folk may be of a different opinion. I sincerely hope that the precautions you are taking in England will be the means of staying the dreadful plague.

ROBT. AIR.

A great deal has been made, by those who hold to the epidemic theory, of the fact of the disease breaking out among the dairy cows of London. If these cow-sheds had bred the disease, as suggested by them, it is strange that it had not broken out before, for the same causes have been at work for generations; but, unfortunately for this argument, the disease made its appearance first in those cow-sheds contiguous to the Metropolitan Cattle Market; while those in the City, equally insalubrious, I learn, have all along been free from it. It is not difficult to understand why these cows in the London dairies should have been among its first victims: their unnatural diet, together with confinement in a vitiated atmosphere, would naturally weaken their constitutions, thereby rendering them, as unhealthy dwellings and privations do the human family, more susceptible to disease. I now come to a more important part of my subject—the curative, remedial, or preventive measures. First, then, as to the curative: Much has been said and written upon the modes of cure: again the press and the public were somewhat hard upon the veterinary profession, so far as I understand the position taken by these gentlemen, it is this—

* Berseem is Arabic for clover.

that the disease lies in the system without any symptoms being manifest so long that when the animal does fall the chances of cure are so small, and the danger to surrounding herds so great, that the most prudent, the most politic course is to slaughter the animal, and thus prevent the spread of the malady, the chances appear to be that in attempting to cure one animal risk is incurred, by keeping it alive, of spreading it to a hundred others. From what has come under my own observation, it appears to me that until some remedy is discovered upon which the farmer may undoubtedly rely, the cause thus advocated is the best for the cattle-owner to pursue, had the animals to which I allude been promptly slaughtered on the first indication of the disease, instead of curative measures being attempted, the total loss would have been considerably less. A highly respectable veterinary surgeon of many years' standing in my locality thinks with the much-abused professors that the pole-axe is the best remedy. We must not forget that were these gentlemen to pursue a contrary course, they might run up a long bill against their clients: their practice has at least the merit of disinterestedness. Like all other diseases, the chances of recovery depend upon the intensity of the attack, at best, however, they are but few; for from a report which has been recently published of the number of animals that have been attacked, I find that only from 4 to 5 per cent. have survived. It appears that the veterinary professors who advocate the immediate slaughter are backed-up in their views by the most eminent veterinary surgeons on the Continent, these gentlemen have had far more experience and more abundant opportunities of studying the various forms and stages of the disease than our English members of the profession. It will be remembered that when in 1863 the small-pox broke out among the sheep in the south-west of England, it was exterminated in less than a month by the slaughter of very few flocks. Having said thus much respecting the veterinary profession, there is one point to which they might probably have given more attention, I allude to premonitory symptoms. If correctly informed, I believe the profession maintain that no premonitory symptoms are to be discovered until the animals hopelessly fall, a view which appears to me and other non-professional people most inexplicable and exceptional. Perhaps I might be allowed most respectfully to urge upon the profession that every scientific and other appliance should be resorted to in order to discover whether there are not some slight symptoms not hitherto noticed in the early stages of the disease. This is my only hope, that this at present mysterious malady may be successfully treated. A non-professional friend of mine, who has had many opportunities of observing infected cattle, informs me that he has noticed that for days before the animal falls the breathing is first uneasy, and subsequently more laboured: the breath of the animal is also offensive. The outbreak of the cattle plague has brought out a host of quacks, eager to reap a harvest out of the misfortunes of others. Pamphlets and advertisements are abundantly circulated, the vinegar dealer maintains that bathing the animal with that liquid is a *certain* cure; others interested in the sale of gypsum, carbolic acid, and other articles publish statements urging their preventive properties; and so on, down to the more humble country farmer who perhaps may head his advertisement, "No cure, no pay." The homeopathic treatment has been brought forward, and claims its share of public attention. Since preparing my paper, I find that the editor of *Bell's Messenger* has given a very favourable mention of the doings and pamphlets

of a homœopathic practitioner (Mr. Moore). No names are, however, given of the owners of animals which are said to have been so successfully treated. I do not think the farmers of England have much faith in the globule theory; and it will require something more than the assurances of the worthy editor of Mr. Moore's respectability to convince them that infinitesimal practice is right, either in diet or physic. According to Professor Gamgee, no medical treatment can be said to have been successful; for as large a proportion of animals have got well without any treatment, as those upon which the doctors and others had tried their remedies. The practice adopted of wrapping round the bodies of diseased animals blankets or woollen cloths appears to be a sensible one, and has, we are assured by General Cotton and others, been found of service. So many plans have been recommended, that, were I to go into this part of the subject, my paper would be of undue length. I see in this morning's papers, however, some very important statements were made at Norwich on Saturday last by Lord Bury. It appears that some 4,700 cases of rinderpest have been treated in Holland: 45 per cent. had been saved through the means of homœopathic and allopathic treatment, the homœopathic treatment having proved, according to this authority, the most successful; but as the inquiry to which the noble lord alludes was set on foot by homœopathic practitioners, due allowance must be made for the proclivities of the gentlemen sent over. Before leaving this part of my subject, I should wish to make one or two remarks, which will not, I think, be considered out of place. There has existed a feeling, for years past, that the veterinary art has not made the same progress as other sciences, this to the farmers of England, with their more valuable and increasing flocks and herds, is an important question; I believe by gentlemen holding the highest position in the profession this evil has been felt. So long, however, as farmers prefer the services of uneducated and ignorant farriers, upon the mistaken notion of cheapness, to the services of properly-educated and intelligent veterinary surgeons, it cannot be expected that any great improvement will take place in the style of men practising the veterinary art. I compare the present state of things in many districts to what our forefathers did in going to the barber to be bled, instead of going, as we do in the present day, to the medical practitioner for advice. When more enlightened views prevail with respect to the veterinary profession, and when it takes a position, as I think it ought, equal in respectability, or caste, or whatever you like to call it, to other professions, then it may fairly be expected that young men of intelligence and education will turn their attention to the study of the diseases of our domestic animals. I now come to the last and by far the most important part of my subject—the remedial or preventive measures. The old adage of "Prevention is better than cure" was never more fitting than in the present case. The farmers themselves can do much in preventing this fearful disease from spreading and taking a permanent home in this country, first in cheerfully acquiescing in the course recommended, of abstaining from all dealing and traffic in cattle for a given period (to this I will shortly further allude). The grazing of cattle on roadsides should be imperatively forbidden; animals should be supplied with generous food and pure water. If half-starved animals—of which, I am sorry to say, there are a large number still to be found in England—are left to shiver under hedges, or at best racked up with straw in cold, comfortless yards, the owners must not expect, when danger approaches, to escape the con-

tagion. All buildings should be kept clean, well ventilated, and occasionally limewashed; or perhaps, what is better still, chloride of lime or other disinfectants should be freely used. It has been said, but with what truth I cannot say, that one of the best disinfectant modes is that of tarring the noses of the animals every day. This plan has been put forth by men of experience on the Continent; and as it is inexpensive, and as no harm could result from its adoption, I have singled it out as one of the most feasible modes I have met with. When an animal is attacked and it is resolved to attempt a cure, the early and perfect isolation is a matter of the first importance. Having hinted at what owners themselves may do, I now come to a more important question to the farmers of England, viz., what steps should be adopted by Government in this and any future outbreak to extirpate and prevent the disease spreading. It is true we are indebted to the Continent for a large supply of cattle and sheep, and no thoughtful man now-a-days would wish to interfere with the free importation of food for our population: at the same time, we as farmers have a right to demand from the Government such precautionary measures as will ensure the most valuable animals in the known world from falling victims to diseases introduced by foreign importations. During the last twenty or twenty-five years the British farmer has suffered frightful losses in his cattle, from diseases that were previously unknown in this country: it has been stated, with what truth I cannot say, that these diseases have destroyed more animal food than has been imported during the period named; but certain it is, that our own herds would have been far more numerous, and consequently our own means of feeding the people far greater, had these diseases been kept out of the country. In 1857, our Government was fearful lest the rinderpest, which was raging on the Continent, should be introduced here, Professor Simonds was sent there by the agricultural societies of the three kingdoms, on a mission of inquiry; luckily, we at that time escaped the expected visitation. As the introduction of the disease was at any time possible, I consider that the Government should have insisted upon a thorough inspection, and not allowed it to remain a mere scare as it has been, the idea of one man having to examine some six animals a minute, or nearly as fast as we should count them, and this perhaps in the night, is simply ridiculous. To make the inspection thorough, a larger number of inspectors must be appointed, should the country object to this course on the score of expense, let the owners of the animals pay a small fee per head for the veterinary certificate; the most rampant free-trader could not, I imagine, object to this very small piece of "protection." Had such an inspection as I advocate been adopted, England might probably have been spared the present outbreak; and here I would state that it would be well for us to take a leaf out of the foreigner's book, I would call your attention to the following fact: I have on several occasions had to send Short-horn bulls to the Continent; before shipping them I have been required to sign a certificate and get it counter-signed by the local authorities, that no infectious disease had been prevalent in my neighbourhood for the previous six or twelve months. Russia requires this condition, and yet England interposes scarcely an obstacle to the introduction of her poisonous distempers into these islands. I believe, however, the Government is waking up; for I learn from Professor Simonds that the examination of imported cattle is in a more satisfactory state. Whitehall has issued its Orders in Council, and

although some of these have not been altogether satisfactory, they evince a desire on the part of the Government to arrest the progress of the disease. Here I would observe that when further legislation is attempted upon the cattle question, I trust the Government will not be thwarted and opposed as it was the Session before last upon the "Cattle Prevention Diseases Bill." I could not join many of my friends in their opposition to this bill: it contained many good clauses, and had it been carried it would now have been found most beneficial; I learn that it was abandoned by the Government, not altogether by the opposition it met with here, but through that of the Irish members, who thought it would damage their export trade; the Irish breeders, be it remembered, were the very first to call out when they saw danger at their own doors; and who, through their importunity, have induced the Government—and, as I think, properly—to stop the importation of cattle into their island. To revert to the Orders in Council: The stoppage of fairs and markets is a step in the right direction. The order should, however, have been peremptory, and not left to the discretion of the local authorities, as a partial stoppage was useless. I firmly believe that had farmers ceased from purchasing at fairs and markets when the plague first broke out, we should now have known but little about it. Some inconvenience will be caused by this regulation, but one good will perhaps result from it: farmers will have to do more business with each other, and less with the middle-man, who of late years has not only fixed the price of the stock, but has had the lion's share of the profits. Very little good, however, will attend the stoppage of fairs and markets so long as men can purchase animals from infected districts and drive them when and where they please—so long, also, as butchers and others can attend the Metropolitan market and send the animals alive from there into the country. The Order in Council states that no animal shall be brought to this market unless for immediate slaughtering, in my opinion it should also have stated that it should not leave London *alive*. This leads me to another point: should England continue to be visited with plague among her cattle, the establishment of markets for foreign animals at the various ports of debarkation is worthy of consideration; or, perhaps, what would be better still, the erection of abattoirs at the several ports, the animals could be slaughtered and sent to the various dead-meat markets of the country. Old Smithfield will require something to fill it, and I do not know to what better purpose the Corporation of London could put it. I am aware it will be said that this course would entail loss upon the foreigner, it might do to a small extent; but when really so much is at stake—the welfare, I may say the very life, of the seven or eight millions of cattle of these islands—this ought not to be considered; we are bound, the good Book says, "to care first for those of our own household." Memorials have been sent from some parts of the country to the Home Secretary, requesting that measures may be taken to stop the importation of foreign cattle and sheep for the next six months, such, in the opinion of the memorialists, being the only means of eradicating the plague. The resolution adopted by the committee of the Newcastle Farmers' Club is as follows:—"That this Committee petition the Home Secretary to take measures to stop the importation of foreign cattle and sheep for the next six months, such being, in their opinion, the only means of eradicating the rinderpest from this country; and, also, that in their opinion every facility should be given for the importation of dead meat, so as not to interfere with

the supply of the food of the people"—a course not likely to be adopted, and, looking to the millions of consumers, it is one in which I cannot concur. That part of the Order in Council relating to the appointment of inspectors and the powers given to them, is open to great objection, and is of a very arbitrary nature. If the appointments were given to none but skilful men, there would not be much injury done; but where unskilful men are appointed, "vested with a little brief authority," we cannot but think great losses have been entailed upon private individuals, by the unnecessary slaughter of a large number of animals. If Government intends to compensate the owners of cattle for such slaughter, there will not be so much to complain of, except the loss to the nation. I am not surprised to find that there is a very strong opinion in many parts of the country, that it would only be a matter of justice on the part of the Government that where animals have been slaughtered by orders of their inspectors some compensation should be made. This view was strongly urged by Lord Winchelsea, in a forcible letter to the *Times*, on October 20th. Others go further, and consider that compensation should be made to all who have suffered any loss by the plague. This view of the question is so well put by the committee of the "Newark Cattle Plague Compensation Association," in an address to the Privy Council, that I will quote their words: "The committee respectfully would submit to your lordships that inasmuch as the owners of English cattle in this country have been in no wise instrumental in introducing this disease, it appears to the committee to press with peculiar hardship upon the English cattle-owner, if he has to bear the entire loss caused by the introduction of a foreign disease, consequent upon the importation of foreign cattle for the benefit of the community at large; that the subject should be treated, as it is in fact, as a national question; and that those who have suffered any loss, by reason of the plague, should be deemed equitably entitled to some remuneration from the national exchequer." I do not know what Mr. Gladstone will say to this, who, I hope, entertains a more kindly feeling towards the agricultural interest than some are disposed to give him credit for. It would, however, be well to remind him of what all men in office like—a precedent. The Orders in Council during the last century provided that a measure of compensation should be made to all those whose animals were destroyed in conformity with the regulations then issued. Whether or not the country will listen to the suggestion, one thing is certain, the farmers cannot be twitted with having done nothing to help themselves, praiseworthy efforts have been made in most counties, by owners of stock banding themselves together to indemnify each other against apprehended losses. It appears, however, from enquiries I have made upon the subject, that with two exceptions only, viz., Banbury and Hertford, these associations have not been formed upon a legal basis: this is an important matter, Mr. Tidd Pratt, an eminent authority upon such matters, informs me that to render any assurance association legal, it must be registered under the Joint Stock Companies' Act of 1862; and unless this is done, proceedings cannot be taken against members for the recovery of the amounts due from them; and what is perhaps of more importance, there is no limit to the liability incurred by individual members. The principles upon which these associations are established are as numerous almost as the counties in which they are in action, if they are to gain a permanent and successful footing, it strikes me they must, like fire insurance offices, be few in number, and embrace all diseases. Having

touched upon these various points, there is one other to which I would invite your particular attention. The question of effectually dealing with the cattle plague, without resorting to such rigid measures as would paralyse the whole cattle trade of the country, has had my best and serious consideration. I have come to the conclusion that a simple plan might be adopted which would soon put an end to the malady. In the first place stop all fairs and markets for a given time, except for the sale of fat stock, due precautionary measures being adopted to prevent such animals leaving any town or place until slaughtered. It should be ordered, that in any village or township where the disease should break out, an inventory of all cattle be at once taken; that none should be allowed to pass through or out of that village or township, or perhaps the adjoining one as well, so long as there was any case in it, and for three weeks after, and that a heavy penalty be inflicted for a breach of this law. I think the police might be employed in this service (unless their new duties of looking after the poachers would prevent them), that the veterinary inspectors should see all cattle weekly according to the inventory, and that no animal should be buried or otherwise made away with, without a certificate from the inspector. If this regulation were to be put into practice, it would be at once ascertained where diseased beasts were to be found; the murrain would soon be narrowed in its limits, and very soon effectually stamped out, and this without the enormous inconvenience to farmers and others by the adoption of more rigid measures. In a highly interesting pamphlet, written by the late M. Renault, and published recently under the authority of the French Government, I find that similar, only more despotic, steps have been adopted by Austria and Prussia for some years past on their eastern frontier; and, at the present moment, France, by its prefects, is enforcing even more rigorous measures. I quote also from Lord Bury again, who says: "That on the appearance of the disease, the Dutch Government immediately drew a sanitary cordon for a considerable distance around the locality. Agents and sentries were appointed to watch all the roads and to prevent any movement of stock outside the infested district, which contains about 250 square miles. The success of this step had been established by the fact that while within it about 5,000 cases of the rinderpest had occurred, outside of it there had been only three cases." Gentlemen, I now leave the matter in your hands, feeling assured that your time will be well occupied in discussing a subject which so much affects not only the farmers, but the masses of this great country. For we cannot disguise the fact that, should the cattle plague continue to increase, as from the late returns appears to be the case, meat will advance to such a price, that it will be beyond the reach of thousands who have hitherto enjoyed this luxury. Such is the state of things in countries where its ravages have been severe. My brother (Mr. James Howard) informs me that when he was in Cairo last spring, beef was from 2s. 6d. to 3s. per lb. I earnestly hope that such measures will be taken as will prevent any such calamity befalling our highly-favoured land. (Cheers.)

Mr. W. J. Brown (Hazebury, Box, Chippenham), said as a humble member of that Club he felt very grateful to Mr. Howard for introducing that subject, which was one of the utmost importance to the country as well as to agriculturists. He was thankful to say that as an individual he had not suffered at all from the cattle plague; but it had lately appeared in his district, within about ten miles from his farm, and he felt as certain that it was introduced there by foreign beasts as that he was alive at that moment. The first case of which he would

speak occurred at Kingswood, in the neighbourhood of Bristol. Nothing was there known of the disease till some foreign beasts passed through the village. A small herd of six beasts was afterwards attacked, and they were all killed directly. There were four more foreign beasts which were purchased in the Bristol market, whither they had travelled from London. After being purchased they passed through a healthy district, and nothing appeared to be the matter until they had reached the premises of the purchaser, Mr. Wyatt, a butcher and farmer of Beach. Within a very short time, Mr. Matthews, a neighbour of his, saw that one of these animals was unwell, which was taken away in a cart, the other three driven at the same time. Mr. Matthews' farm adjoined Mr. Wyatt's, and to his sorrow Mr. Matthews discovered early in October that one of his twelve calves was attacked; all died in about fourteen days, the second calf that took the disease living the longest. Immediately the calves were dead, the disease broke out amongst twenty-four dairy cows and eight grazing beasts. Twenty-five of these animals were dead, and it was expected that the remainder would have to be killed in the early part of this week. Mr. Matthews had some beasts in another part of his farm which were as yet well. Another neighbour of his, Mr. Moses Gibbs, had eighteen cattle—viz., five cows, eight steers and heifers, and five yearlings; and they, too, had suffered from the same cause. The first symptom which he observed appeared on the 23rd of October; he then perceived a stiffness in his heifers; and for three days he treated them for influenza. The inspectors saw them, and condemned them, and within eight days of the commencement of the attack the whole herd was gone: seven being buried and eleven killed. The disease next appeared at a distance of about a mile, on the farm of Mr. John Gibbs, a brother of Mr. Moses Gibbs. The result was that a herd of twelve steers was ordered to be killed, and that order was carried out. The next case was that of Mrs. Truebody, who had fourteen cows. Up to Saturday one was killed and buried; another was ill on Saturday night. The disease, he might remark, seemed to go in a straight line from east to west. Mr. Highnam, of Dyrham, bought at Kingsdown fair ninety ewes, which were brought home. Twenty were taken out and put with his usual flock, and all up to the present time were well. Of the remaining seventy, thirty-four were dead up to last night, and the symptoms were exactly the same as those in the beasts. He could not account in any way for the fact of the sheep having thus suffered; but he repeated that he had no doubt whatever that the cattle got the disease from the foreign animals which were brought into the district.

Alderman MEECH wished to state one or two facts connected with his own district that tended to confirm what had been said as to the disease being spread from the Metropolitan market. In one case some cattle which were brought from London to Kelsdon were put on Mr. Revel's farm, *in transitu*, as it were, to another farm; and the consequence was that all the cows on the farm died, or had to be slaughtered. A number of cows in an adjoining meadow caught the disease from those cows, and there were other cases in which animals were lost through the introduction of cattle from the London market. Fortunately his own cattle, and that of some of his neighbours, had escaped; but he believed that was because they had not bought any new stock. So far as he could judge, the disease was spread by contagion. They had, indeed, had an unusually hot summer, and there was an extraordinary amount of effluvia from the animals which were shut up. Disease was no doubt floating about in the air, and that perhaps produced a tendency to disease in cattle, as well as in the human subject; but his observations in his own neighbour-

hood had led him to believe that it was by contagion that the cattle-disease was propagated. When contact was done away with, there was no case of disease; and he had heard of no case of disease within five or six miles of his farm for the last three or four weeks.

Mr. JOSEPH MARTIN (Littleport, Ely) said he believed that those who were at all acquainted with this disease had arrived at the conclusion that it was contagious. When it first broke out in his own immediate neighbourhood they could trace it to calves brought from London, and the result was that from forty to fifty animals were lost in the parish of Mepal. Within the last three days the plague had broken out at Ely. The owner of these animals had weaned, if not bred them; they had always been in his possession, and were quite isolated in situation. At the time they were attacked they were all tied up in a lodge, and two were taken at the same time without any clue to the way in which they were infected.

A MEMBER: How far were they from the road?

Mr. MARTIN: Some distance from the turnpike-road.

Mr. CHARLES HOWARD: Did the same men attend them that attended the others?

Mr. MARTIN: No. This disease visited our country about a hundred years ago, and it was found so highly contagious that the government adopted very stringent measures with regard to the men who attended upon animals. Such persons were obliged to have their hair tied up in bags, it being thought that the disease was conveyed in the hair, the clothes and shoes. At that period, all the fat cattle in Lincolnshire being dead, some butchers crossed into Yorkshire to purchase beef; and in every yard they entered the disease appeared. The Government had issued orders with regard to fairs: but what did the dealers do? They offered animals for sale upon bye roads and private property, to evade the order in Council. He was glad to find an order had been issued to prevent such occurrences, though it was like shutting the stable door when the horse was gone. If he were Chancellor of the Exchequer he would place a tax on cattle dealers, which would tend to check that evil (laughter). He had noticed that wherever there was a fair, directly after they could trace the rinderpest. Take the case of Leicestershire. There was no disease whatever there till the fair was held: now it had broken out. It was the same in regard to Peterborough. There also there was no disease till after the fair; but it was now raging most virulently. Now, with regard to sheep, it had been stated by Professor Simonds that Mr. Harvey's sheep had the plague. He (Mr. Martin) did not see those sheep, and he knew nothing about the matter himself; but he had heard other gentlemen express a different opinion from that of the Professor. He should be happy to hear the Professor's opinion on that subject; and he should be glad if he would state why the sheep that were confined with the bullocks that had the disease did not also take it. As to curative measures, he was convinced that if they were to make an analysis of the cases of animals which had been treated and cured, it would not speak very favourably for the veterinary profession. From the returns that had been made, it appeared that only one-half per cent. had been cured; but he would assume the proportion to be four or five per cent. It was acknowledged that a large number of the animals which had been treated and had recovered would probably have recovered if they had not been treated; and the proportion cured in consequence of treatment must perhaps be reduced to two per cent. Was it not, then, the best course, when such a contagious disease appeared on a farm, to have the animals killed at once? (Hear, hear).

Mr. LEE STEERE (Jays Park, Dorking), said he regretted that a meeting of the club for the consideration of that im-

portant subject had not been convened before, because he thought the farmers, represented as they were by themselves that evening, had not had fair play (Hear, hear). They had seen in the papers, day after day, different views expressed on this question, some writers abusing the veterinary profession and some the Government for this thing and that; but the farmers themselves had never as a body properly spoken out. He should himself deal with the subject by asking questions with a view to obtaining information. He should like to know, in the first place, whether the meeting did or did not consider that this plague had been imported from foreign lands? His own opinion was that that certainly was the case, and he thought the plague would continue as long as cattle were imported from abroad in the free sort of way that they were, without any possibility of a proper inspection; especially as it was the opinion of Professor Simonds and other great veterinary authorities that an animal might have come in contact with the plague on the other side of the water, might be five days coming over, might pass the inspectors, might go to the Metropolitan market, and might actually go into the country and pass the inspectors there before the disease broke out. He really did not see how they were to guard against the disease being imported into this country, so long as the importation of foreign cattle was allowed (Hear, hear). He was not going to advocate at that moment the stopping of the importation of foreign cattle, for he could not understand how our population was to be fed without it; but he would not say that it would not come to that. Violent diseases, it was said, required violent remedies; and if this evil continued in its present dreadful form, he really believed the Government would have to step in and prevent the importation of any foreign cattle. There were many persons who would have it that this disease was not imported from abroad, but had sprung up among the dairy establishments of London. He should like to know whether that was the opinion of the meeting. He should also be glad to learn what was their opinion as to the course which the Government had pursued in ordering their cattle to be destroyed on the word of an inspector, without giving them a guarantee that they were to be remunerated for their loss (Hear, hear). He wished to know what was the view taken by a large assemblage of farmers coming from all parts of England on that important point. His own opinion was that it was a most unheard of thing in this free country for the Government to order men's cattle to be destroyed without offering them any remuneration (Hear, hear). Such a course was perfectly un-English (cheers). Indeed, he must say that the conduct of the Government altogether in this matter seemed to be open to great doubt. They had read in the papers that one of Her Majesty's ministers, when he got up at a large gathering in Yorkshire to return thanks for his health being drunk, said, in effect, "I suppose, gentlemen, I must allude at this meeting to this cattle plague, which is going on in the country; I consider that and the Fenian disturbance in Ireland to be both of the same calibre." When such language was used by Sir Charles Wood, a cabinet minister, what confidence could the farmers of England have in the Government in reference to this question (Hear, hear)? The gentleman who had introduced the subject went so fully into it that he had in fact left but little to be added. They must all feel that without stringent measures, such as the stopping of the fairs and markets, which ought to be done through a general order of the Government, and not left to magistrates at the different petty sessions, the disease was likely to assume a still more formidable character; and even a penalty of £20 would not alone be sufficient to prevent the

spread of the malady. As regarded the question of treatment or cure when the disease had broken out, he could not doubt which course was preferable when he saw such men as Professors Simonds, Gamgee, and Budd advocating the use of the knife in preference to tampering with the disease and trying to cure it, especially as farmers generally had not sufficient conveniences for the separation of animals. Farmers, like other classes of society, would rather pay small bills than large ones, unless there were some evident advantage connected with a large outlay; and considering what experience had been gained on this subject, it was not surprising that they did not incur the cost of resorting to a first-rate veterinary surgeon, when subjected to the ravages of the cattle plague (Hear, hear).

Mr. J. N. LEE (London), said he should not have intruded on the attention of the meeting for a moment, had not reference been made by Mr. Howard to a paper with which he was connected (*Bell's Weekly Messenger*). A gentleman who had just sat down asked the important question whether they believed the disease to be capable of cure or not; while another gentleman stated that the cases of cure had only been from 2 to 4 per cent. It having been affirmed that Mr. Moore, a homœopathic veterinary surgeon, had successfully treated, either personally or through instructions given by him, a large number of cases, he (Mr. Lee) thought it was nothing but right that the attention of the farmers of the country should be drawn to the subject, so that they might, by a careful consideration of the arguments and facts stated by Mr. Moore, form some idea as to whether the disease could or could not be cured. Mr. Howard had referred to a statement made by Lord Bury, that only 45 per cent. of the cases which had come under allopathic and homœopathic treatment have been cured.

Mr. HOWARD said he remarked that the homœopaths appeared to have had the best of it; he combined the results of the two modes of treatment.

Mr. LEE continued: If Mr. Howard would refer again to the report of Lord Bury's speech he would find that his lordship stated, on the authority of Dr. Hamilton, that the total per-centage of cures by homœopathic treatment was 75 per cent. Some gentlemen present were, perhaps, not acquainted with the facts mentioned by Lord Bury. Premising that he (Mr. Lee) was neither a homœopath nor an allopath in relation to this matter, it being his duty to place before the farmers of England all the well-authenticated facts which were brought under his notice, and believing they were as capable of drawing right conclusions from those facts as he himself was, he would read the following extract from Lord Bury's speech: "In Sept., when the cattle plague was raging in Holland, two Belgian gentlemen, M. Gandy, a member of the Veterinary College, Brussels, and M. Sentin, a homœopathic chemist, offered to the Dutch Government that if a district were put under their charge, and if they would not allow them to be interfered with, and would not require them to make a report until a sufficient number of cases had been treated, they would on their part give their services gratuitously, and try the system fairly. This was accepted by the Dutch Government, who agreed to give a commune up to the homœopaths, it being understood that the veterinary surgeon of that commune should be required to certify that every case which came under homœopathic treatment was an actual case of rinderpest. Matterness, the district assigned to the homœopaths, was a commune situated in the very centre of the infected district. The peasants and proprietors were somewhat prejudiced against the homœopathic system in the first instance, and did not enter cordially into the view of the homœopaths, but be-

fore the termination of the experiment they were greatly pleased with it, and gave every assistance in their power. At the commencement of the experiment the proportion of cures effected out of the animals attacked was 70 per cent., but in the last three weeks the homœopaths saved nine out of every ten cattle which came under their treatment. Matterness was situated within a mile of Kethel, in the very centre of what had come to be styled the "black district," so that the homœopaths did not enter upon their tasks under peculiarly favourable circumstances. They continued it till September 22, and 80 beasts came under their care, each case being certified by the veterinary surgeon as one of actual rinderpest. Of these 80 animals 60 recovered and 20 died. Besides these, 230 beasts in the commune were put under prophylactic homœopathic treatment; 25 took the disease before the treatment had had time to work, but in the fourth week no fresh cases had occurred, and on the 21st of October the commune was pronounced free from disease, and had remained free from that time to the present. A large proportion of the cattle attacked in the commune of Matterness had been treated by the allopaths before the homœopaths came into the district. In all, 189 cases came under treatment, 80 under the homœopathic system, and 109 under the other. As 73 cures only were effected, of which 60 were attributed in an official report to the homœopaths, the balance was largely in favour of the homœopathic mode of treatment." Now he (Mr. Lee) thought those facts deserved to be brought under the notice of the farmers of England (Hear, hear). An important question arose out of this, namely, whether the Privy Council ought not to communicate with the Dutch Government, with the view of ascertaining whether what was stated by Lord Bury on the authority of Dr. Hamilton was true or not; and if it should turn out to be true, means ought, he thought, to be adopted for trying the effect of the homœopathic system here (Hear, hear). Lord Bury closed his address by saying, "The homœopathic body felt that the statistics which he had quoted were of no use unless they were brought to some practical result, and if a veterinary surgeon were allowed to certify that each case assigned to them was one of rinderpest before they treated it, and if they had a sufficient number of cases to enable them to make a fair average, they would undertake that a competent veterinary surgeon should come to take the cases in hand, and a leading firm of homœopathic chemists had also agreed to give the necessary medicines free of cost." He (Mr. Lee) hoped this proposal would be accepted.

Professor SIMONDS said: In proceeding to make a few observations on what we must all regard as a national calamity, I shall endeavour to be as concise as possible, and to answer, so far as my memory will allow, some of the remarks which have fallen from preceding speakers. First, I will say a word with reference to the origin of this affection. It has been supposed by some to have sprung up spontaneously; but all the evidence which we have in relation to it, all that we know of its history, leads to the conclusion that it has not existed in this country for 120 years. After having taken what is said by those who hold the theory of a spontaneous origin, the theory that this is a disease which arises from ordinary causes, into full consideration, I would ask whether in the last 120 years there has not been sufficient mismanagement of our cattle to have caused the disease to be developed long ago if it could arise simply from spontaneous action or from ordinary influences bearing on the health of animals. With regard to the question how this disease came to appear first in cowsheds in London—a fact which has led to its being attributed to mismanagement of the London cows—I would observe,

that it is an established fact that it was noticed very early in some of the best-managed dairies of the metropolis, while it is also an established fact that it made its appearance in some of the dairy cows in the Metropolitan Market. There is another point which should not be forgotten in considering this question, namely, that of late years the whole of the cow-sheds of London have been under local management. The parish vestries have appointed sanitary inspectors, whose duty it has been to visit the cow-sheds to see that they were properly drained, ventilated, and so on, and not to allow a larger number of animals to be placed in any shed than could be kept there without deteriorating the air. Moreover, these inspectors have always looked tolerably close into such matters, and I believe it may be affirmed that the cows of London were never in a better condition than they were, generally speaking, at the time when this disease first appeared. I now come—for I must be exceedingly brief in my remarks—to the question of the probable origin of this disease in foreign countries. You must bear in mind that this disease belongs to Russia (Hear, hear); it belongs to all the countries lying to the south of Russia; and whenever it has made its way into Austria Proper, or into Hungary, or into Bohemia, or into Galicia, or into Prussia, it has invariably been traced to the introduction of animals from Russia, or from the countries bordering on those I have just mentioned. There is no spontaneous origin of this disease on the Continent of Europe, westward of a line drawn from Memel on the Baltic to Trieste in the Gulf of Venice. There has been no rinderpest in Europe since the last general war, when its presence was to be accounted for by the fact that the armies of Russia and Prussia were compelled to draw their supplies of meat from the countries to which I have alluded. It followed in the wake of those armies and spread all over the Continent; and it was not until after the establishment of peace, when nation after nation saw the vast amount of injury which it had sustained, and that the whole of the cattle was being swept away, that recourse was had to those stringent measures which were then put into operation. By those measures they expelled the disease from their borders; and it was thus put back, as it were, to those countries to which I have alluded, where stringent measures could not be adopted, and which have in consequence become the abiding home of the cattle-pest. Now, it has been said that this is a disease belonging especially to the steppe cattle, that is to say, the cattle nurtured and fed on the vast plains of Moldavia, Wallachia, and Podolia, and that whenever they are removed from those districts to others, it is developed by ordinary causes. Now, to that opinion I certainly take exception, and I do so because I know, from my own investigation of this malady, that it belongs not to the steppe cattle or to any other cattle belonging to those countries; it rather belongs to the whole of the animals existing in those countries, and from time to time, like small-pox in sheep and other special affections, it assumes a more serious character than usual, and spreads over a greater extent of country, and then by means of the ordinary cattle traffic it is carried to other countries. Turning to the facts connected with the appearance of this disease in England, you will recollect that until May, 1865, we never received any animals, either directly or indirectly, from Russia; and I would appeal to any one who is conversant with the matter whether at the time the Russian cattle first arrived in England they were not looked upon by all the cattle dealers as very great novelties in the Metropolitan Market. If any animals did come from Russia before, it was certainly indirectly, not directly; but it is a disputed point whether we ever had any at all before May this year. Now, every one who is acquainted with the sanitary regulations of

the Continent must know that if this disease were to spread from Russia to Prussia, and were to come in the ordinary course of cattle traffic from Prussia to England, it would have to break through no end of cordons. Every man's premises would be surrounded with a cordon; no individual belonging to those premises would be allowed to come out of that cordon, and no stranger would be allowed to enter it. Supposing that diseased cattle were to cross the Prussian frontier and get into one cordon, there would then be another cordon; there would, in fact, be cordon after cordon, and nobody can tell what number of cordons the animals would have to break through, before they could depart from the western side of Prussia. You see, therefore, that there are so many difficulties in the way of our getting this disease overland, that it may well be considered almost impossible that it can have come in that way from the countries to which I have alluded. I wish to lay stress on this point, namely, that although the disease has existed, and exists at this moment in Hungary, it is in such a remote part of that country that Austria herself is not affected by it. I may remark that when I had been visiting Galicia, and afterwards went to Vienna, I was not permitted to enter the Austrian cattle sheds because I had been in the country of the pest. That shows how stringent are the regulations in Austria, and illustrates the alarm which is felt in other European countries besides our own; while we could not have a better proof of the improbability of our having received the disease overland from the countries which I have mentioned. Well, now, we will go to Russia; and you must bear in mind that there the state of things is totally different from that which I have described. In consequence of representations having been made to certain individuals that animals were to be bought at a very low rate in Esthonia, a person went out on commission to arrange for the purchase of some, and he secured a number which were brought together at Revel. Those animals were put on board a steamer which came down the Baltic; that steamer called at Copenhagen for orders on the 22nd of May, and within six days from the time of its leaving Revel it arrived at Hull. Here, then, was a direct importation in six days from Revel, the first and only one that we ever had. Now, it has been argued with regard to these Russian cattle that they come out of Esthonia, that they were fed there by the barons, and that it is impossible that they can have had the disease; for not only had they been for a long time on the premises of the individual owners, but no disease of this kind existed in Esthonia. The Government has been blamed, and it has been praised. Now, with regard to its being blamed on this question of looking into the condition of the Russian cattle in the first instance: I should say that we questioned the Russian authorities as to the state of health of the animals in Esthonia almost immediately the disease became known in this country. As we anticipated, the reply was that there was no disease there (Hear, hear). It was not at all likely that we should get any other reply (Hear, hear); it was not at all probable that they would say that a disease existed which would interfere with the trade which was likely to spring up with Great Britain (Hear, hear). Now there is another fact connected with these Revel cattle—and in making these remarks, let me say that I do not wish to bear too hard on those cattle: I am only stating facts—there is another fact which has been too much lost sight of, namely, that the contract was for animals which were to have weighed 1,000 lbs. each, live weight. When the animals were brought down to the individual who purchased them, he found that a great number of them did not come up to that weight, and consequently he refused to take them. "Well," said the barons, "if you will not take our cattle, we will go elsewhere,

and see if we cannot get cattle that will make up the weight." They went in search of other animals; they went nobody knows where: it may have been to St. Petersburg or to Wilna; and the result was that a number of fresh cattle were brought down in waggons to Revel. They were four days on the journey to Revel, and were so much knocked about, that, when the man who had engaged to get them shipped saw them, he said, "I cannot take them; they are so much injured that I am afraid they would be altogether unfit for the English market." A dispute having arisen between the parties, two experts were called in, to say whether the shipper was to take any of those cattle; and the result was that he took thirteen of them, which were put on board the vessel with the others, to make up the cargo of 321. Now, without laying too much stress on this matter, I would observe that there is this fact in connection with these Revel cattle, that one of the animals had been so bruised and injured on the journey to Revel that it died in the yard before any of the others were put on board, while another animal was ill on board ship. The illness of the last animal could not be attributed to the voyage, because, if that animal could be struck down by the six days' voyage from Revel to Hull, it would have been the only animal out of 321 which suffered from that cause. We see here something like a special case of disease. That animal required more than ordinary treatment on board, for brandy-and-water and other stimulants were administered to it. Well, these 321 animals arrived in Hull on the 25th of May. Some persons have asked, "How is it, if these animals brought the disease, that it did not break out at Hull?" None of them went into the Hull market—not one of them was purchased there—but some of them were bought by a butcher at Manchester, while others went to Derby and Wakefield to be slaughtered. A number of them were bought by an individual almost immediately after being landed, having been driven to a convenient place, where he could look over them and select such as he required. That individual did not pick out the sick animal which I have mentioned; but it was sent to London, where it arrived on the 29th of May. On reaching London, it went into a layer in Maiden-lane, where it remained until it went with the others into the Metropolitan Market on the 21st of June. Twenty of these animals had been previously picked out and sent down to Portsmouth for the shipping, and the number that went into the metropolitan market was reduced to that extent. Now, in consequence of those animals having been sold in the Metropolitan Market on 21st of June, we could get no subsequent information with regard to them. They were killed directly after being sold, and went to the Whitechapel market, and we could obtain no information as to whether they were then subject to the pest or not. Here, however, we have the simple fact of animals that came from Russia, the home of the pest, arriving in England within six days, before the period of incubation had elapsed, and being sold in our Metropolitan Market within the time of the disease declaring itself. The first thing which we hear of this disease is that it has shown itself in a dairy close to the Metropolitan Market—that it has shown itself in a dairy connected with layers used for English cattle and also for foreign cattle, where it had assumed a very serious form, and that the attention of a veterinary surgeon was directed to it for the first time on the 21st of June. Now I will leave that outbreak, which you all know took place in Mrs. Nicholls' dairy, to advert for a few moments to one which is not so well known that took place at Hackney. Let us examine what was the cause of the Hackney outbreak. The attention of the veterinary surgeon was first drawn to that case on the 25th of June, and the disease was clearly traceable to a cow which was bought in the Metropolitan Market

on the 19th of June. That was not a foreign cow, but an English one. It was sent up from Buckinghamshire by Mr. Bardsley, a large cattle dealer, and bought on the 19th of June by Mr. Baldwin, and it went direct from the Metropolitan Market into Mr. Baldwin's sheds. Within nine days, the ordinary period of incubation, that animal sickened of the disease; it communicated the disease to the rest of the stock, and the whole 22 or 23 were swept off in a very short time. There is another fact connected with these original outbreaks which I think goes a long way to establish the introduction of the disease, namely that another outbreak took place in Whitechapel about the same time. Here is an outbreak at Hackney, another at Islington, and a third at Whitechapel. How did the outbreak at Whitechapel occur? The man who experienced it was not only a cowkeeper but also a cow dealer; and the animals which he bought in the Metropolitan Market were sent to his sheds, remained there till the next market day, and were then sent again to market. That was his custom. There never was a day when he did not buy animals; so that the outbreak in that case was easily enough accounted for. Now I think, then, that if we look at all these isolated outbreaks, one can hardly suppose that this disease had a spontaneous origin, but must come to the conclusion that in each case the same cause was in operation, that cause being that animals were introduced on the several premises which came direct from the Metropolitan Market (Hear, hear). The only thing wanting in the chain is some connecting link between the 1st of June and the 19th of June. We want to know something about the disease at that period, and it is not improbable that the investigations which are now going on will throw light on that point. I hold, however, that it is highly probable that the disease was introduced from Russia, and is not attributable to any other source. In support of this view we have three positive facts: One, that the disease exists in Russia; fact two, that Russian cattle come here; fact three that within nineteen days after they were landed we had the disease spreading from the Metropolitan Market. These are three important facts, and I don't think any one can get rid of them. I now pass on to speak of some of the original outbreaks of this disease in different parts of the country, and not only in this country but also in Holland, which is intimately connected with our own land. This subject was very properly adverted to by the gentleman who read the introductory paper. And here I must say that a more dispassionate view of the question than that which he took I have never met with (cheers); I never heard the subject treated so well by an unprofessional man; and I wish to convey my individual thanks to Mr. Howard for the information which I have derived from his paper. As regards the original outbreaks of this disease in the country, the outbreaks in Norfolk may, as he said, every one of them be traced, directly or indirectly, to the Metropolitan Market. Animals which had been bought in the Metropolitan Market were sold on Norwich Hill, whence they went to Reepham, North Walsham, and other places, and it was by that means that the disease was spread. The case was similar in Kent and in Sussex. I myself investigated several outbreaks in Sussex, and I traced every one of them to calves bought at Chichester, which calves had been sent direct from the Metropolitan Market. We are now engaged in tracing all the original outbreaks. I believe it will turn out that every single case is traceable to the Metropolitan Market. Let me now allude to the Dutch outbreak. It is generally supposed that that outbreak took place in August. The Club will perhaps be somewhat surprised to hear that it actually took place early in July. It took place in this manner: A number of animals

were sent from Kethel by Mr. Defries to his son here for sale in the Metropolitan Market. They went into the market on the 22nd of June, they went there again on the two succeeding days, and they were not sold, there not being sufficient bid for them. The consequence was that Mr. Defries wrote to his father on the subject, and it was decided that the animals should be sent back to Holland, and back they went, leaving England on the 22nd of July. It was absolutely noticed on the wharf that they were ill before they were sent away. It was not known by the inspector what was amiss with them, but they were evidently out of health. They went direct to Rotterdam, and arrived at Kethel, near Schiedam, and within two days after their arrival they began to die of the disease. Twenty-three or twenty-four were sent back, and twenty-one were lost within a week or ten days after their departure from England. They communicated the disease to some cattle belonging to another person which happened to be in the next pasture, being separated only by an ordinary ditch. In this way the disease was introduced into the neighbourhood of Schiedam, and was making great ravages nearly a month before the Dutch Government knew anything about it. The fact is, we had sent the disease to Holland without their being at all aware of the fact, or knowing any more than we had done at the outset what had to be dealt with. Animals were sent from England to Holland after having been exposed to the disease in our market. It has been said that the Dutch cattle got the disease. That is true enough, but they got it because they first received it here. That is the answer to the statement that it was not Hungarian or any other eastern cattle that introduced the disease into this country (Hear, hear). So much then for the origin of this affection. One word with regard to the question of its extent at the present time. I regret to say that, with the exception of three, or at the utmost four, counties, every county in England has the disease (Hear, hear). The only counties which appear from the returns to be free from it are Hereford, Monmouth, Rutland, and Westmoreland; while two-thirds of Scotland appear to be affected to a greater or less extent. You see, then, how wide-spread this affection is, and how necessary it is that stringent measures should be adopted, far more stringent even than those which had been adopted up to the present time (Hear, hear). One word with reference to the course which has been taken by the Government in this matter. It fell to my lot to make the first communication to the Government with respect to this disease. I received information as to the affection on the 4th of July. I went to the dairy of Mrs. Nicholls under the impression that her animals had been poisoned, that being what was told me by the veterinary surgeon in attendance, and by Mrs. Nicholls herself. Investigating the disease on the spot, I saw enough to make me hesitate at once as to whether that was an ordinary case of poison; and before I left the premises my mind was nearly made up that we had a new cattle disease in the country. I did not say to Mrs. Nicholls, nor to the veterinary surgeon in her presence, that I had any doubt as to what was the nature of the affection; but no sooner was I alone with the veterinary surgeon than I said to him (it having been proposed to analyze the animals' water, the contents of the stomach, and so on), that I thought all that would be of no use whatever, because I feared that we had a new disease to deal with. I also said to him that we must try and ascertain whether there were any more cases which resembled that of Mrs. Nicholls's animals, adding, that if I found that there were others I should then feel no doubt on the subject. The next day I ascertained that other cases of disease had begun, and within five days after that I made a communication to the Government. During the five days

which I spent in investigating the disease I drew up a circular, which was sent to every veterinary surgeon, in order to ascertain whether he had had any instance of such an affection; and I got returns from all parts of the country, showing that there was nothing of the kind. You can readily understand that the Government were not very likely to give full credence at once to my statement. The thing came upon them by surprise, and at first they naturally hesitated as to whether they should or should not deal with this affection. Without mentioning names, I may state that when I went to the Government at a former period with regard to the smallpox in sheep, a gentleman whom I saw said to me, "You will excuse my asking you the question, but are you positive in this matter?" and on my replying that I was positive, he shrugged his shoulders and exclaimed, "Would to God that we had some despotic power!" For want of such power the Government could not take the bull by the horns, and they cannot do so at the present time: their hands are tied. When we are told that the Government have taken strong measures, I would remark that they will have to go to Parliament for a bill of indemnity for what they have done (A voice: "They will get it"). It was not till a bill had been passed for the suppression of smallpox in sheep that the Government were able to act energetically in that matter. In the present case they have proceeded cautiously, and perhaps they have done all that, as a constitutional Government, they ought to have done under the circumstances (A voice: "No"). There were more difficulties in the case than many people supposed. It has been asked why the Government had not indemnified the owners of cattle for their losses. Why they have not got a shilling for that purpose (Hear, hear.) Again, it has been asked why the Government did not do what was done in 1847. The reply is, that they could not do so (A voice: "Parliament might have been called together"). It is easy to find fault afterwards with what has been done; but whatever may be the individual or the collective opinion of those whom I now address as to the conduct of the Government in this matter, I say—say without fear of contradiction—that the Government has acted nobly considering how its hands have been tied up (cries of "No, no"). I am afraid, Mr. Chairman, that this part of the question might lead me into details which would take me away from what I intended to say, and therefore I will content myself with observing that I believe the Government has acted nobly (renewed expressions of dissent). Now, then, I come to the question of the extension of this disease to other animals. I do so because the question has been put to me whether the disease is capable of being communicated from the ox to other animals, and whether those animals can in reality communicate the disease to others. If the question be whether or not sheep are especially susceptible of this affection, I have no hesitation in saying that they are. Those who know me best as a professional man, and who know what have been my advantages over many others—I take no credit to myself on that account—will, I think, feel that I would not be the first man to hoist the danger-signal, and that if I do hoist it, it is because that is necessary. I have hoisted the danger-signal with regard to sheep. I say that sheep have got the disease, and have got it as thoroughly established in their system as oxen. Mr. Harvey, of Norfolk, had 2,000 sheep at Crown Point. He bought a number of Irish steers at Norwich market, and the cattle and the sheep communicated together, the former having previously become infected with the disease. Within a short time 107 or 110 cattle died. Assuming that the sheep were susceptible of the disease—they were, he might observe, placed under favourable circumstances for its extension—and what is the result? Up

to the present time, out of 2,000 sheep at Crown Point, 1,400 have died; and the very fact that 1,400 sheep out of 2,000 have died in the course of a couple of months ought to be sufficient to convince persons who know anything at all about sheep diseases that this is not an ordinary affection. But I go further; and I say that we have taken the discharges from the eyes and nostrils of Mr. Harvey's sheep, and inoculated sheep in London with the matter, and we have produced the disease in the sheep so inoculated. Again, we can show clearly enough that the sheep were labouring under a contagious disease, and a contagious disease allied to the rinderpest. We have exposed cattle to the same sheep that were inoculated from cattle, and the cattle so exposed have taken the disease from the sheep by ordinary infection. With such facts before you, I do not see how you can doubt that my view of the disease of the sheep is a correct one. The case of Mr. Harvey's sheep is not an isolated one; there is also the case of the Blakeney sheep occurring within a few miles. A number of sheep were bought at Thetford, were sent to Blakeney, and took the disease with them, having been exposed to the infection previously. The disease was communicated to the cattle, and nearly all of them died in a few days. I might mention other cases which have occurred in Norfolk, Suffolk, and Essex. I will give you two in Essex—one being the case of a number of ewes, and the other of a lot of lambs. The ewes were bought in June in two lots—nineteen in one lot and twenty in another, and a more healthy set of ewes a man could not look upon. I saw them again and again, and they seemed exceedingly healthy, and were worth £3 a-piece. The cattle plague, however, was introduced on the farm by some bullocks that were driven. These cattle were put into a field adjoining a field of sheep, the separation being a gate-communication between the fields and a low hedge. The result was that the disease spread from the cattle to the sheep, and at the date of the last report out of 90 ewes 48 had died. The ewes were well managed. Two rams were put with them, and one of these also died. The other case was that of 147 lambs bought at Colchester. The disease manifested itself in them, and spread to the cattle on the same farm; and a great part of the cattle are now dead. Here, then, we have a free interchange of the disease between cattle and sheep, as the result of exposure and inoculation (Hear, hear). One word more with reference to treatment. I am one of those who from the beginning have never felt any great confidence that this disease would yield to medical treatment. There are certain diseases—special diseases belonging not merely to cattle but to sheep, and even the human subject—which for all practical purposes have ever been looked upon as incurable. Thus cholera is incurable, yellow fever is incurable, small-pox is incurable. (No, no). Men who have had a medical education say yes; it is only those who possess a partial knowledge that say "no" (laughter). It is a most amusing thing that farmers—I say this with all due deference; for I have a great respect for farmers as a body—it is, I say, a most extraordinary thing that farmers and shepherds should set up their opinions on this question against those of the veterinary profession. [A VOICE: "And parsons do so."] If I were to attempt to dictate to any leading physician as to how he should treat a case of cholera or of yellow fever, he would no doubt consider me a very presumptuous fellow for interfering, with my imperfect knowledge of the matter; and yet we see men who know nothing about medicine, and do not perhaps even know the names of the organs in the animal's body, setting up their opinions as to the curability of this disease, against ours (Hear, hear, and laughter). Many persons speak confidently about typhoid and typhus, when perhaps they could not tell

the meaning of those terms without looking at the dictionary (laughter). Typhus is classed by medical men among incurable diseases; and when we come to look at results not only in England, but throughout the Continent of Europe, we shall find that that view is a sound one. Now, there are two systems of treating the cattle disease, one being called the allopathic, the other the homo-pathic system. Homeopaths tell us that they have treated it successfully: I am very glad to hear it (Hear, hear). If they can prove to my satisfaction that they are able to cure 50 per cent. of cases of cattle plague under the same circumstances in which allopaths have failed, I will declare myself a convert to the system directly (Hear, hear). But I will tell you what we are going to do. It has been said, Let them have a trial. They are going to have a trial (Hear, hear). I believe that Dr. Hamilton himself will have placed at his disposal a certain number of cases to treat exactly as he likes, the only condition being that we will take care that they are genuine cases of cattle-plague (Hear, hear). When homeopaths talk about curing so many cases of cattle disease, you may depend upon it that a great number of them are not cases of that disease at all (Hear, hear). Everything is now cattle-plague (Hear, hear); we have no more mouth-and-foot disease in the country (Hear, hear, and laughter); it is all cattle-plague; we have no lung disease now, everything of that kind is cattle-plague; and, looking at these facts, we can easily account for all the alleged cases of cure. Depend upon it that when you have got genuine cattle-plague to deal with, not more than seven or eight per cent. of the cases will ever recover (Hear, hear). We should endeavour to deal with this evil in the way of prevention before animals have been attacked, but we must have recourse to slaughter as soon as animals have become affected. In order to prevent animals from being attacked there must be perfect isolation; and unless there is perfect and complete isolation, it will, I believe, be many a day before this country will get rid of the cattle-plague (Hear, hear). The way to secure perfect and complete isolation is not merely to stop fairs and markets, but to prevent the transit of cattle altogether, and that must be done. It is impossible to draw a line so long as a man is allowed to drive cattle along a road, and hence the only remedy is entire prohibition. We have already lost 15,000 animals, and I believe that without what I am now advocating we shall lose tens of thousands more in the course of a few months. Let me state, in conclusion, that this morning we received accounts of no less than 299 fresh outbreaks of this disease (Hear, hear).

Mr. J. WILLIAMS (Baydon, Hungerford) said two observations had been made that evening to which he wished to reply. One gentleman said that the farmers of England had never spoken out on this subject, and that it was owing to that course that they were in the predicament that they were. As one of the farmers of England he hoped to speak out that evening before he sat down. Professor Simonds said he thought the Government had acted a noble part in this manner. He denied that, and maintained that the Government had acted in a way to which no other class than the farmers of England would submit (cheers). He meant to speak out on that occasion. He would take them back to the year 1840, and ask Professor Simonds what the Government had done since that period? Were any of these diseases known in England before the importations of cattle which had taken place since 1840?

Professor SIMONDS: Yes.

Mr. J. A. WILLIAMS continued: There were some diseases; but this rinderpest was never known till after the Government introduced the tariff—he did not mean to condemn that

tariff—which had brought the Russian disease with it (Hear, hear). Now, with regard to his own county (Wilts), he might observe that there were two farmers there in his district, one at Ilungerford, the other at Marlborough, who had received authority to do what? Why, to go into the agricultural districts and visit the sheep-folds and the farm yards where there was any apparent disease. Men who knew nothing about sheep—had authority from the magistrates to come there and do what they pleased. He would mention two instances. Last week he (Mr. J. Williams) lost two sheep from murrain. He knew what was the cause of that. His sheep-dog bit some sheep; the virus of the dog entered them, and the result was that they died. Again, his friend, Mr. Chandler, the inventor of the manure-drill, lost eight fat sheep during the last week. Those sheep were previously worth £3 a-piece; but they too suffered from the same cause as his (Mr. Williams's) sheep; and Mr. Chandler told him only on the previous evening that he had to consign them to the manure tank to make manure for the next turnip crop. The men in authority to whom he had referred—he would not mention their names—were very respectable men, and very talented in their profession, but their experience was chiefly among horses, and they knew nothing about sheep; and if they had seen these cases of Mr. Chandler's, and his own, they might have come to the conclusion that they had the cattle plague (Hear, hear). They did not know half as much as the farmers themselves respecting this matter. The authority which they exercised was given to them by the Privy Council. [A Voice: No; by the magistrates.] He repeated that it was given to them by the Privy Council. There was no Parliament sitting, and the power must come from the Privy Council; it was the members of that Council alone that gave authority to the magistrates, and in their turn the magistrates gave these men authority to order sheep to be destroyed (Hear, hear). The Government themselves introduced this disease. Professor Simonds had clearly proved by his arguments that evening that the disease was imported from abroad. The Government themselves authorized the importation of these foreign animals; and what did they now call upon the farmers of England to do? Why, they called upon them, with a penalty of £20 for disobedience, to slaughter their sheep and cattle (Hear, hear). Was it possible, he contended, that that was doing justice to agriculture? (Hear, hear). Was such a monstrosity ever heard of before? (Hear, hear). If the Government said to them, "You must destroy your animals for the benefit of society" he could understand their conduct; and he was quite willing to admit the necessity of so doing, but they had somewhat more than this to do, and that was, after they had ordered the destruction of these animals, and to be buried 5 feet deep at the owner's expense, *to make him compensation for the loss!* (Hear, hear). But he could not admit that they acted a noble part, as Professor Simonds said they had done, when they said in effect, "We require you to kill your animals for the benefit of the country, but we will not pay you their value." As regarded the cattle disease, he was happy to say that he knew nothing of it personally; but he believed it was propagated at the different markets and fairs. A young man, who went to Kingsdown fair, bought there 140 sheep, which were afterwards brought to the neighbourhood of Marlborough. They were, he believed, over-driven, and the whole were dead. As regards about half of them, a number of gentlemen in the neighbourhood offered to pay about £1 a head for them, and the owner received £60 as compensation for having them killed, and this had completely stopped any infection. Mr. Williams concluded by observing that he had the honour of introducing a new member that evening in the person of Sir

George Jenkinson, Bart., who desired to take part in this discussion.

Mr. E. TATTERSALL (Knightsbridge) said in a conversation which he had some time ago in Yorkshire, with a gentleman who had passed the greater part of his life as an officer in the Austrian service, he learnt some circumstances connected with the cattle plague which perfectly frightened him. It was not till then that he had any idea of the great national danger with which we were threatened. What that gentleman told him induced him to write a letter to the *Times*, which with the chairman's permission he would now read, as it bore upon one or two points which had been touched upon that evening. This letter was dated the 20th of September, and was as follows: "When in Yorkshire a few days since I met with a gentleman who had passed the greater part of his life as an officer in the Austrian service. We spoke of the cattle plague, and he treated it as undoubtedly being the 'rinderpest,' and his opinion was that it would kill a great proportion of the cattle in England. He told me that when it made its appearance in Austria, as soon as it broke out in a particular district, a line was drawn around the parish, varying in circumference, and every head of cattle killed, whether attacked or not, and no cattle allowed to go on to the infected ground for a given period. Experience had proved that it was the only effectual means of stopping this dreadful disease, which he had known to destroy immense herds. I inquired who compensated the owners of the cattle, and he said, 'The Government.' Now, believing as I do that this is the 'rinderpest,' and believing nothing of the spontaneous nonsense theory, and believing that the disease is spreading and will spread, will it not be the wisest, best, and cheapest plan in the end, at once and literally, boldly to 'take the bull by the horns' and kill him, bury the already infected animals, and send the others to market while fit to be sent? But then comes the important question, Who is to pay? The country ought; I speak as a consumer, and I believe it will be the best, the most honest, and the cheapest plan in the end, to make it a national question, and the sooner the better. It is unfair to expect the agricultural interest to take the burdens on themselves. Many of them are great sufferers already. This is a question as vitally affecting the well-being of the citizen and the manufacturing and labouring population as it does the landlord, the farmer, and the agricultural labourer, and the loss ought to fall on the community, and not upon a class. How this can best be done is not for me to point out. I am told it is done on the Continent, and it may be another instance of the old adage, that 'they manage these things better abroad;' but the new Parliament would surely sanction any steps the Government might think fit to take in such an emergency, when everything depends upon prompt action." That was the simple text of the few words which he had to offer that evening. Having written this letter nearly two months since, it was satisfactory to him to find the opinion which he then expressed, that this disease was the rinderpest, borne out in the able paper of Mr. Howard. They had also heard Professor Simonds, in one of the ablest arguments to which he ever listened, proving that it was the rinderpest and nothing else, proving also that it was communicated from cattle to sheep, and would probably, therefore, inflict one of the greatest losses ever entailed upon this country in any age. The most important question to farmers was, of course, how they were to be compensated for their losses. He was simply a consumer; but he regarded this question as a national one, and he thought no one could pretend to calculate within thousands or even hundreds of thousands of pounds what the loss would ultimately amount to. Let the Farmers' Club, whose voice on

such a question ought to be powerful, urge the Government to do what they all said it ought to do in reference to this matter. Professor Simonds thought the Government had done all it could do under the circumstances. Possibly that was the case. This was not a despotic country, and thank God for it; but Parliament was about to meet, and it became that important body to make its voice heard (Hear, hear). There ought, in his opinion, to be a committee of that Club formed, to take the requisite steps. He did not know whether or not the Cattle Plague Commission was still in existence, but he felt certain that Lord Spencer and the other members of it would have been glad to listen to a deputation from that Club, and he hoped they would not separate that evening without having done something towards laying their opinions before Parliament and the nation. It was a great advantage that they had now a farmer sitting in the House of Commons, who was also a member of the Cattle Plague Commission. The first farmer ever returned to that House was a Norfolk man. Being a Norfolk man himself, he thought that was a great honour to the county, and he also thought that the sooner other counties followed the example which Norfolk had set, the better (Hear, hear). They ought to appoint a committee, who would impress on members of Parliament the necessity of doing justice in reference to questions of compensation. Our laws were founded on justice and honesty; but it was not just or honest for a Government to say to a man, "If your cattle should be attacked, you must kill them; but you shall not be paid for them." Why cause farmers to be ruined for the benefit of others? (Hear, hear). He maintained that no Government had a right to order cattle to be killed without granting compensation. He thought any man would be almost justified in refusing to obey, merely to try the point. He believed that the law of England would bear him out in such refusal. He would therefore move a resolution to this effect—that a deputation from the Farmers' Club should wait upon the Cattle Plague Commission, to state that, in their opinion, it was cruel and unjust to order any man's cattle to be destroyed for the public good, without giving him fair compensation, and to impress upon the Commission the necessity of advising and urging Parliament, as soon as it met, to legislate on the matter, and to make a retrospective as well as prospective law, that every farmer whose cattle were killed for the good of the country should be paid for them by the public.

Mr H. CORBET, on the part of the committee, asked attention for one moment, particularly after the suggestion which had just been made by Mr. Tattersall. The Royal Commission did them the honour to send to them to inquire whether they could give any evidence on this question, while he might tell the meeting in passing, that that Commission, so far as the taking of evidence was concerned, had now closed its labours, as it had also, he believed, closed, as respected the report to be presented. In response to the invitation received, Mr. John Clayden, of Littlebury, went before the Commission, on behalf of the Farmers' Club. Mr. Clayden was then in the room; and though he (Mr. Corbet) did not know whether or not that gentleman wished to speak, he thought it only fair to the committee of the Club to make known that they had already acted, by anticipation, upon the suggestion of Mr. Tattersall (cheers).

Sir GEORGE JENKINSON, said: Although he came there not to speak, but to listen, on the occasion of his election as a member of that Club, yet having, as a magistrate, paid a great deal of attention to the subject for some months, he would venture to make one or two remarks. He must first protest against the assertion that the magistrates had given an

order for the indiscriminate slaughter of cattle that were supposed to be attacked. That order was issued by the Privy Council, and not by the magistrates, who had no more power to issue such an order than he had to issue an order that any one present should be killed (laughter). He would exemplify what he meant by stating what had occurred in his own county. When an order of the Privy Council was sent down to the petty sessional division of which he happened to be the Chairman, that inspectors should be appointed with such powers as were provided by the Government, he for one protested against that; and he said that he could never consent as a magistrate to give to any set of men power to walk into a farmer's yard and direct cattle to be killed unless the Government undertook to make compensation. He was happy that the magistrates who acted with him in that district entirely concurred in his views on that point, and up to the present moment no such authority had been given. To give inspectors authority to destroy cattle without any remuneration being granted to the owner was, in his opinion, unfair and unconstitutional. With regard to the fairs and markets also, he thought a great mistake was made by the Government in that respect, though Professor Simonds, who so much praised the Government, might be of a different opinion. The Government had in every instance tried to get the magistrates to take upon their shoulders the performance of disagreeable tasks, instead of incurring the responsibility themselves. He asserted with confidence, with regard to every disagreeable order that affected the farmers of England, that the Government had tried to place the work on the shoulders of the magistrates, instead of facing the responsibility which it was incumbent upon it to undertake (Hear, hear). In the days when they had a strong Government, magistrates were not told to do the work of the Government. As to the Government not having power to order compensation for the animals destroyed, it was all fudge. The same power which enabled the Government to give authority for cattle to be killed indiscriminately, and for fairs and markets to be shut up, would enable them to grant compensation to farmers for cattle destroyed under the authority of the inspectors. When Sir George Grey urged the magistrates, as he did lately, to order fairs and markets to be shut up, and went no further, it reminded him (Sir George Jenkinson) of his early soldiering days, when he used to practise the goose or balance step without gaining ground (laughter). Supposing the magistrates in nineteen divisions out of twenty in a county decided upon shutting up the fairs and markets, and those of the twentieth refrained from taking that course, not only would the dealers in the twentieth division get all the custom, but the plague might be disseminated from that division to all the others. Thus they would be just as badly off as if no order had been issued. To give an example in his own neighbourhood most of the fairs and markets were closed; but they were not stopped at Bristol, and the consequence was that diseased cattle which came from London to Bristol found their way into the adjoining district (Hear, hear). Had the Government stopped the markets all over England and Scotland they would have done some good; that was the only way to stamp out the disease. As he said two months ago, nothing but the stoppage of the circulation of cattle along the roads would meet the case, and in his opinion that would be found preferable to indiscriminate slaughter. They had heard so many instances that evening of the ravages of the rinderpest that it would be useless to multiply them; but he would urge upon them, if possible in still more forcible language than that of Mr. Tattersall, the suggestion which was made by that gentleman. He did think the farmers had made a great mistake in not combining to use in relation to this matter the enormous strength which they possessed (Hear, hear). He would ask them to look back to the cotton famine. Was that viewed as a local misfortune? (Hear, hear). Was that allowed to rest on one class? No; the manufacturers as a body combined; they knew their power, and they used it; and until the farmers of England pursued a similar course, until they put a pressure on the Government, through their representatives in Parliament, and exercised that influence to which their numbers, their wealth, and their intelligence entitled them, they would not obtain justice for themselves

with regard to this question (cheers). All such afflictions and dispensations as the present were, he believed, sent by an all-wise Providence for some good end; and if the cattle-plague should teach the farmers of England to help themselves in future by banding themselves more together for their own protection, it would in that way have produced a most beneficial effect. He was not fond of quoting Mr. Bright, but he must say that gentlemen had given farmers some good advice when speaking on the subject of the Game-laws; and if farmers combined together, they might at all events compel the Government to adopt better measures in future for regulating the importation of foreign cattle and the transit of all cattle in various parts of the country. With such results, however much they might have suffered, it would not have been in vain (Hear, hear).

Mr. JOHN CLAYDEN (Littlebury, Safron Walden) said: As they had been informed by Mr. Corbet that he had had the honour of representing the club before the Royal Commission on the cattle-plague, he wished to say one or two words in explanation. It would have been presumption in him to have tendered his evidence; but the fact was that the Commission wrote, inviting information from the club; and he (Mr. Clayden) having written a letter on the subject, expressing some strong opinions, was deputed by the committee to go and give evidence. He was very glad to find that the measures which he recommended were in full accordance with the opinion of Professor Simonds, our friend Mr. Howard, and other speakers. It would have been madness for him to say, "Do not allow the importation of foreign animals;" but he said, "Let those which are imported be slaughtered, and let all the cattle he slaughtered that are required for the consumption of the kingdom, and not one be moved alive for at least a month, the skins being disinfected. Half measures, he said, would not be sufficient in such a case as that. A contagious disease like the cattle-plague required strong measures. Lord Spencer asked him whether he would not allow the Metropolitan and a few local markets to be open, if all were slaughtered that went there, and his reply was, that if all animals that went to the Metropolitan and other markets were required to be slaughtered on the spot, injustice would be done to senders, as a limited number of markets would increase the supply of the animals, and the number of purchasers become restricted, as those only who possessed slaughter-houses could purchase them. His concluding remark to the Royal Commission was that he was aware that he was recommending the adoption of harsh and un-English measures; but in such a contagious disease as they had to contend with, he felt that sooner or later they must be adopted. In his own neighbourhood he was happy to say they at present had only a slight infliction of the disease. It occurred some weeks ago on two farms in one parish, from the purchase of London dairy calves. The whole of the animals on those two farms were slaughtered and buried, and it was gratifying to state that there had been no more disease in that parish, nor in the entire sessional division. Nothing can speak louder in favour of isolation than this case does.

Mr. JAMES HOWARD (Bedford) said, Mr. Tattersall had proposed an important resolution; and, as he had consented to put it in more general terms, he had undertaken to second it. The resolution, as amended, was as follows: "That the various legislative questions arising out of the discussion this evening be referred to the committee of the club, with a request from the meeting that it will appoint a deputation to bring this question under the attention of the Government."

Mr. S. SIDNEY (Islington) said he would himself have felt great pleasure in seconding that resolution, because he thought they had now arrived at a few positive conclusions. There could be no question, after the exhaustive address of Mr. Howard, and the speech of Professor Simonds, that this disease was highly contagious, and that up to the present moment no remedy for it had been discovered. What, then, remained? Why, that the farmers and breeders of England should emphatically represent to the Government their views on the subject. With regard to the observations of Sir George Jenkinson, it should be recollected that they were living in a constitutional country; and however desirable strong measures might appear, he hoped he should never see the time when a Minister sitting in an office in London might by a stroke of his pen settle or unsettle the whole trade of the country.

Sir GEORGE JENKINSON: I never said that he should do so.

Mr. SIDNEY continued: Gentlemen could not have the ad-

vantage, whatever it might be, of both despotic and constitutional government in England. The country had not yet made up its mind as to what was wanted. When that was done, and the Government was fully informed on the point, its wishes would, no doubt, be carried out.

Sir GEORGE JENKINSON said he must, with the Chairman's permission, deny having said that any Minister should issue despotic orders; what he said was that the Government had requested magistrates to do certain acts which they should have done themselves if they were to be done at all (Hear, hear).

Mr. WEBER said: As this disease was a new one in this country, and of such an anomalous character, he should have preferred an inquiry in the first instance for the purpose of ascertaining its nature; and it might afterwards have been seen what remediable measures would do. To him, it appeared, a very wrong course to destroy animals without having given them a chance of recovery.

Mr. TATTERSALL'S resolution in its amended form was then put on the chair, and passed unanimously.

The CHAIRMAN said he thought there was very little left for him to say, after the able introduction of Mr. Howard, the elaborate address of Professor Simonds, and the other speeches which had been delivered. A brother-in-law of his was, he believed, unfortunate enough to buy the first infected bullocks imported into the county of Norfolk from London; and Lord Spencer remarked to him (the Chairman) on the singular coincidence that more animals were cured out of that lot than out of any other that had come under the consideration of the commissioners. Of 26 animals which his brother-in-law purchased at that time, fourteen were now alive. They were bought in Norwich on the 1st of July, and fell down with the disease on the 4th. He had before him the report from Norwich made up to Saturday evening, and he was sorry to say it was stated that there were a larger number of applications for forms of claims for compensation on that day than on any previous day.

Mr. CHARLES HOWARD then replied. He said the excellent discussion which had taken place had in fact left him but little to say. He regretted that the gentleman who spoke last, did not speak earlier, as he had given expression to sentiments which were not those that had been generally advocated that evening (Hear, hear). One gentleman had alluded to Sir Charles Wood. If the nonsense attributed to the right hon. baronet was really uttered by him, he (Mr. Howard) could not be surprised at his having been rejected by Halifax (laughter). They must all have been pleased with what fell from Professor Simonds, the statements which he made being of the most conclusive character. He must, however, allow him to remark that he did not say that the Government had power to grant compensation; what he said was that he did not know what Parliament might say with regard to compensation. He agreed with other speakers that evening that no other class would have submitted to be treated as the farmers had been, and he hoped the Government would show itself prepared to deal out some measure of justice to that branch of the community. His friend Mr. Lee had, he was afraid, been somewhat annoyed at his allusion to the article in *Bell's Messenger*. Now he begged to say that he meant nothing offensive; but he must be allowed to observe that the cures in question rested on the statements of homoeopathic practitioners (Hear, hear). No names were given, and they all knew that when persons had a hobby they were apt to ride it very hard, and to give more credit to it than was due (Hear, hear). All he could say was that he had no prejudice against homoeopathy, though a departed member of his family was induced to try that system for a great length of time, and, having found it of no avail, afterwards had recourse to a different system. He was rather pleased to find Professor Simonds standing up for his profession; farmers themselves not liking to be told how they should carry on their business, by persons who did not belong to it. He was not surprised that that gentleman had taken a professional view of the subject, and he regretted that anything had been said in disparagement of that useful body to which he belonged.

On the motion of Mr. SKELTON, seconded by Mr. CROSSKILL, thanks were voted to Mr. Howard for his introductory paper.

On the motion of Mr. J. A. WILLIAMS, seconded by Mr. COUSSMAKER, thanks were afterwards accorded to the Chairman, and this terminated the proceedings.

THE CATTLE PLAGUE.

The following is the first Report of the Commissioners appointed to inquire into the origin and nature of the Cattle Plague, dated October 31, 1865—

TO THE QUEEN'S MOST EXCELLENT MAJESTY.

Your Majesty was pleased, by your Commission dated the 29th day of September, 1865, to intrust to us the task of investigating the origin and nature of a disorder which now prevails among the cattle of great Britain, and is generally designated the Cattle Plague, and of ascertaining as far as possible the mode of treatment best adapted for the cure of the affected animals, and the regulations which may with the greatest advantage be made with a view to prevent the spreading of the said disorder, and to avert any future outbreak of it. Your Majesty was at the same time pleased to ordain that we, or any five or more of us, might have liberty to report to you our proceedings under the commission from time to time, should we judge it expedient to do so.

The terms of the Commission therefore authorize us, if we think fit, to report specially to your Majesty on any part of the subject committed to us, reserving other parts of it for further investigation. The nature of the calamity under which England and Scotland are at present suffering, and which may at any moment attack Ireland, the extensive growth of the disease, its destructive character, and the imperfect success which has hitherto attended all endeavours to arrest its progress, make it clearly our duty to take this course, and to lose no time in humbly presenting to your Majesty such recommendations as, after careful consideration, we believe the emergency to require. We shall introduce them with a brief statement on the history of the disease and on its general character.

I.

The disease which is the subject of this inquiry was first observed and recognised in Great Britain towards the close of the month of June. Two English cows had been purchased on the 19th of June in the Metropolitan Cattle Market by a cow-keeper residing in Islington, in whose sheds they were when the symptoms of disease attracted, on the 27th, the notice of the veterinary surgeon in charge. Similar symptoms were observed on the 28th by the same surgeon in a cow belonging to a dairyman in Hackney, which had been purchased in the same place and on the same day. Two Dutch cows in a Lambeth shed, likewise bought in the market on the 19th, were attacked on the 24th. The malady broke out immediately afterwards in many London dairies, and spread with extreme rapidity, destroying great number of animals. The Islington cowkeeper lost her whole herd of 93; she afterwards bought more, and lost them also, making 106 or 107 in all. An inspector who had charge of a great part of the north and north-east of London states that in his own district more than four-fifths have either died or been slaughtered, and the general average within the precincts of the metropolis is probably at least as high. Very early in July it appeared in Norfolk; a little later in Suffolk and Shropshire; then in one county after another, and before the end of the month it had invaded Scotland. In all the earlier cases, at least, it seems to have been directly traceable to purchases made in the Metropolitan Market; but Norwich-hill and other country markets speedily became, in their respective districts, subordinate centres of infection. On the 13th of October it had extended into 29 counties in England, 2 in Wales, and 16 in Scotland, and was still advancing.

The subjoined tabular statement, prepared by the Veterinary Department of the Privy Council-office from such official

information as that department has received from inspectors throughout the country, has already appeared in the public papers:

	Attacked.			Total Cases reported from the commencement of the Disease.				
	Week ending October 14.	Week ending October 21.	Week ending October 28.	Attacked.	Killed.	Died.	Recovered.	Remaining.
1. Metropolitan Police District	158	194	158	5773	2557	2529	202	485
2. South Eastern Co.	225	154	205	3284	1169	1667	197	251
3. South Midland Co.	73	94	230	833	373	282	42	136
4. Eastern Counties.	141	183	335	3081	1051	1482	161	387
5. South Western Co.	17	11	3	116	51	45	7	13
6. West Midland Co.	31	9	31	214	74	112	4	24
7. North Midland Co.	8	32	18	109	54	41	6	8
8. North Western Co.	28	30	42	176	55	75	6	40
9. Yorkshire	26	39	113	253	66	126	11	50
10. Northern Counties.	47	86	34	472	212	201	21	35
11. Monmouthshire & Wales	43	60	33	180	51	110	4	14
12. Scotland	257	828	666	3182	1153	1241	184	604
	1054	1729	1873	17673	6866	7912	848	2047

It must be remarked, however, that such statements as this cannot be accepted as accurate accounts—which, indeed they do not profess to be—of the real state and progress of the disease. They represent such cases only as the several inspectors have been able to detect since they were respectively appointed. But information reaches the inspector indirectly, by accident, or by common report; and a butcher, jobber, dairyman, or farmer has strong motives for not disclosing to the inspector anything that he can easily hide. We were told by a London cowkeeper that, of forty-one cows which died or were slaughtered on his premises, the inspector got only the knacker's receipt for the eleven that actually died of the disease. It must therefore, we fear, be assumed that the cases reported form but a small proportion of those which have actually occurred; and it would be unsafe to draw from them any inference as to the amount of loss actually incurred by the plague.

Meanwhile, from the same general centre, the Metropolitan Market, it appears to have crossed the sea to Holland with some Dutch oxen which had been shipped from Rotterdam to London, had been exposed during three successive market-days, and, not finding a sale at an adequate profit, had been re-shipped from London to Rotterdam. The disease broke out among them soon after their return, when they were pasturing at Kethel, near Schiedam, in a long strip of meadow, on which other strips abutted, each occupied by stock. It spread at once in many directions, and soon overran the whole province of South Holland, and thence, we believe, it has been from time to time reimported into this country. The measures adopted in the Netherlands seem to have been at the outset less stringent than was desirable; too much discretion was left to the local authorities; but the provinces of North Holland, Utrecht, and Guelderland have, by strictly guarding their respective frontiers, protected themselves in a great measure from the contagion.

In both France and Belgium importation from England has been prohibited, and stringent and minute regulations have been issued by the Government of each country with a view to extinguish the disease wherever it might break out. These measures appear to have been successful. Only a few isolated and somewhat doubtful cases have been hitherto reported from each of these countries.

Twenty-three days at least before the first outbreak in London, a parcel of Russian bullocks, the first, it is asserted, that

were ever brought direct from that country to England,* were sold in the Metropolitan Market by the importer, a London cattle salesman. They had been shipped at Revel and landed at Hull; part of them had there been sold, and sent to various places in the north of England, and the rest despatched to London. The southern provinces of Russia, are, if not the birth-place, the constant home of a disease which, as we shall hereafter show, is identical with the cattle plague, and to this cargo the introduction of the plague into England has been often and confidently ascribed. Some obscurity hangs over the earlier history of the transaction. That the province of Esthonia, where the cattle were contracted for, and where the bulk of them, at least, were collected, was at and before the date of shipment free from the plague, is certified by authority which we should be reluctant, and indeed have no ground, to question. But it is alleged by the importer's agent, who procured and shipped the animals and had charge of them on the voyage, that a few (13 out of 321) were not Esthonian, but part of a larger lot brought in vans from the neighbourhood of St. Petersburg to make up the number required; and he further alleges that out of this lot two were ill at Revel with a disease which he believes to have been the cattle plague. This part of his story is flatly contradicted by his principal, as his assertion that the animals were not examined on landing is by the Customs' inspector at Hull.† It must be added that he does not know the disease otherwise than by description; that of the 321 imported none appear to have shown any signs of disease, except one, which was ill on the voyage, but looked well when it reached London; and that no animal is proved to have contracted the disease in the Metropolitan Market from the 1st (the date of its supposed introduction) to the 19th (that of its supposed transmission to the Islington, Lambeth, and Hackney cows), a negative circumstance of no great weight, since an early case of the malady may easily have been mistaken for one of pleuro-pneumonia, but not to be left out of consideration. The facts, then, though by no means inconsistent with the theory which attributes the appearance of the plague in England to the Revel cargo, fall far short of establishing that theory, unless we assume that the event cannot possibly be accounted for in any other way. Further inquiry may throw new light on the question. At present we are not able to pronounce a decided opinion on it; nor, for the practical conclusions which we are about to offer, is it material on which side the truth lies.

Another explanation has been suggested in the following extract of a letter from her Majesty's Consul-General at Hamburg:—

"Mr. Schrader, an intelligent veterinary surgeon, who is specially employed by the Hamburg Government to examine cattle and sheep shipped for foreign ports, has informed me he thinks it most probable that the murrain has been introduced into England by importation from Holland. He states that in the course of the last spring a considerable number of Hungarian cattle were conveyed from Vienna into Holland through Germany by land carriage and river navigation: that at the same time the rinderpest had broken out in the neighbourhood of Vienna, particularly in the village of Florisdorf; and that in the month of May a number of cattle at or near Utrecht in Holland had been attacked by it. Although, therefore, the murrain in Holland broke out with much greater violence at a later period of the year, it would be quite possible that it passed from the Dutch ports into England so early as the month of May last. With respect to the rumour of diseased cattle having been imported into England from the Russian port of Revel in Esthonia, either directly or by way of Lubek, no credit is attached to it here; and, indeed, the great distance of Revel both from Great Britain and from the cattle districts in Southern Russia, seems to render it unlikely that diseased cattle should have reached England from that port without any observation."

* A copy of an entry from the books of the London Custom-house has been sent to us, from which it would appear that twenty Russian oxen were landed at London from St. Petersburg on the 4th of July, 1850. The point is of no importance.

† It is proper to add that we have been furnished with the original certificate, dated the 20th of May, and signed by the two veterinary surgeons who were charged with the examination of the cargo, that they had examined it, and that it was sound and free from disease, as well as with a subsequent declaration by them to the same effect.

One fact mentioned in this letter, and which has also been elicited in evidence, deserves particular attention, since it is of more than historical importance. Hungarian and Gallician cattle now undoubtedly come in considerable numbers to the English market. "Large quantities," says one dealer, "are sent every week." Hungary and Galicia, from their neighbourhood to the steppe country of Russia in Europe, are often attacked by the plague; and Hungary, at least, has suffered severely from it during the present year. The completion of the two great lines of railway which, traversing Central and Southern Germany, now connect Hamburg and Rotterdam with both Vienna and Lemberg, have opened to us these new supplies. Respecting the average duration of the transit, we have no precise information; nor do we at present know how far it may be abridged in particular cases, nor by what regulations it is guarded at the beginning or end of the journey. We may have occasion to recur to this point hereafter. At present we advert to it only as suggesting a possible solution of the question how the cattle plague reached England.

II.

That the disease in question is contagious, that the contagion is extraordinarily swift and subtle, and that it is most destructive in its effects, there can be no doubt whatever. The manner in which it has spread, travelling perceptibly, for the most part, in the track of animals brought from some centre of infection, and establishing a new centre wherever it has been suffered to effect a lodgment; the very difficulty that has been often found, even where the fact of infection was certain, in tracing the exact means by which the infection was conveyed; the havoc it has made in open pastures not less than in the London cowsheds, and against which fresh air, wholesome food, and carefully tending seem to have afforded no defence, would be quite enough to establish these conclusions, even if no light were thrown upon them by past history or by the experience of other countries. Of the witnesses, indeed, whom we have examined, even those who believe it to have been spontaneously generated here, acknowledge that it is contagious, and, with hardly an exception, admit that it is new in England.

But we see no reason to question the evidence which has been produced before us, proving that it is the same disease as that which has been long known under the name of the rinderpest (cattle plague), or steppe-murrain. The symptoms during life, the results of *post-mortem* examination, and the whole train of general characteristics, are precisely the same, or varied only by such minute shades of difference as we might expect to find in different breeds and climates. A comparison of what we see with the full descriptions contained in foreign medical works leaves on this head no doubt at all; and no doubt is entertained by competent and trustworthy witnesses who have had and used opportunities of personal observation both here and abroad. The whole experience gained of it in countries where it is not, as here, a stranger—countries frequently infested by it, where its effects are perfectly well known, its nature has been carefully studied, and the strictest measures have been devised and are enforced by law to detect and extirpate it as often as it crosses the frontiers—becomes, therefore, at once available for our guidance. These measures are wholly based on the view that the disease propagates itself by contagion, and by contagion alone; and the extreme stringency of them proves in the most forcible manner the virulence and activity of the evil which they are designed to keep at bay. They are measures, indeed, which never could be enforced (they involve sacrifices to which no people could be reasonably asked to submit), unless in the presence of a dreaded enemy, and under a sense of overwhelming necessity. The same view is, we believe, universally held among the eminent veterinarians of Germany—men of high education and intelligence; and it has recently been endorsed by the congress of veterinary surgeons held at Vienna in August last, which was attended by members of the profession from almost every country in Europe.

This is not, however, the first time that this plague has visited England. Fatal murrains among cattle, analogous to, if not identical with it, have at various times appeared here. In 1348-9, after the black death had produced great mortality among men, a grievous plague attacked cattle, which perished by thousands. A great rise in the price of food followed, notwithstanding an abundant harvest. The diseased cattle were

slaughtered, and infected herds were as much as possible separated from those which were sound; while the herdsmen who attended the former were not allowed to come in contact with the latter. About a century later (in 1480) a second murrain of the same kind committed great devastation. There is no accurate account of the symptoms exhibited by cattle attacked during these murrains; and we are, therefore, unable to ascertain whether they were different from, or identical with, the present disease; but there is every reason to believe that the distemper which in 1715 made a brief inroad, but was promptly expelled, and which in 1745 renewed the attack, and held its ground till 1757, was exactly the same as the present plague. Of this we have proof in the descriptions extant of the symptoms then observed, and of the morbid appearances after death. In a paper communicated to the Royal Society in January, 1746, by Dr. Mortimer, he ascribes the origin of the murrain to two calves imported from Holland by a farmer living near Poplar, early in 1745. The spring and summer had been very wet, the autumn dry and cold, the early winter cold and damp. The disease communicated to the cows of this farmer spread through Essex, reached London, and was propagated in various directions from the metropolitan markets. It entered Berkshire, however, by two cows bought at a fair in Essex. Almost simultaneously with its appearance in London, a violent distemper broke out among the horned cattle of Argylshire, sweeping off 6,000 beasts; but there is no exact information as to the nature of the Scotch murrain. The disease for some time advanced in a manner which appeared to justify the Government in treating its attacks as mere local outbreaks; and it was nearly a year after its first appearance that the country became sufficiently aroused to use national measures for the repression of it. But by this time it had taken too deep root for these to be effective. A commission for Middlesex was appointed on the 25th of November, 1745. The commission, with the short experience of 1715 to guide them, appointed various cowkeepers and butchers as inspectors of cattle, and instructed them:—

1. To inspect cowhouses and to separate sick from sound cows.
2. To see that all cowhouses and yards were kept thoroughly clean.
3. To kill all sick cows and calves, to slash their hides so as to render them useless, with several cuts from head to tail and round the body, and then to bury them in graves ten feet deep, with two bushels of unslacked lime to each cow.
4. To certify to the destruction of cows, for each of which the Treasury gave 40s.
5. To see that proper returns were made by cowkeepers as to their losses.

The disease having spread beyond Middlesex, an Act was passed, and received the Royal Assent on the 13th of February, 1746, empowering the Crown to issue, through the Privy Council, rules and directions in order to prevent the distemper spreading among horned cattle.

On the 12th of March, 1746, an Order in Council was passed in which the incurable nature of the malady is set forth, and the following regulations appear:—

1. Cowkeepers must shoot infected beasts, and bury them entire with slashed hides, four feet deep covered with lime. (The direction as to the use of lime was subsequently revoked.)
2. All hay and litter used by diseased animals must be burnt. No herdsmen who has attended a diseased beast is to go near a sound one without changing his clothes.
3. Infected sheds must be thoroughly washed all over, then disinfected with burning sulphur, &c., again repeatedly washed with vinegar and water, and not used for two months.
4. Convalescent animals are not to be mixed with sound ones for one month, and not then till they have been well carried and cleansed with vinegar and water.
5. Flesh and entrails of diseased cattle are not to be given as food to other animals.
6. No man whose herd is infected is to be allowed to drive any cattle, whether diseased or not, beyond the boundary of his farm; and, even when disease has disappeared, his herd is to be held infected for a month.
7. Local authorities, such as churchwardens, overseers, constables, or cattle inspectors who may be appointed, are charged to see the executions of this Order. They are to report to each meeting of justices and make exact returns.

8. These local authorities are to persuade owners to divide up their herds into separate parts; they are not only to see to the burying of diseased cattle, but also the burial of all infected dung.

9. Cattle travelling on roads are to be stopped and examined.

10. Houses, buildings, or yards used for cattle, sound or diseased, are to be carefully kept clean.

11. Compensation for slaughtered cattle is to be paid at the rate of 40s. per head; for calves, 10s.

Towards the end of the year the Government found that the local authorities had not assisted them vigorously in the execution of the first order, and they issued a second to the effect, that from the 27th of December for three calendar months no person shall send to fairs or markets any cattle except for immediate slaughter, or "buy, sell, or expose to sale" any cattle except those which are ready for immediate slaughter. Nor is this privilege of selling fat cattle permitted to anyone whose herd is infected. Therefore all beasts going to fairs or markets must be provided with passes from a justice; or, failing him, from other competent local authorities, given on the owner's oath that his cattle are and have been for a month free from the plague.

No raw hides shall be sold or allowed to be transported without like passes; but hides and horns of diseased beasts must absolutely be destroyed, and a compensation of 10s. per hide is given.

A third Order in Council was issued, proscribing the district from the Humber and Trent, and not allowing cattle to be driven out of it northwards from the 19th of December, 1746, to the following 27th of March.

On the 13th of February, 1747, an Act to amend and extend the powers of the previous Act was passed, and this was followed, up to 1757, by various continuing and enlarging statutes. In addition to the measures before specified, these statutes also provided that sales of cattle should only take place when the seller had had them in his possession for 40 days; calves were not allowed to be sold, in order that they might be preserved for breeding purposes, and severe restrictions were put on the sale of the hides of diseased animals.

Various orders were issued during the year 1747, stopping local fairs, and empowering local authorities to do so when they found it expedient.

The plague in consequence of these orders was extinguished where the local authorities acted with vigour, but lingered in other places, whence it spread after a time as rapidly as ever. In consequence of this, in September, 1747, there is a new suspension of all fairs and markets and of all movements of cattle, except for slaughter, throughout the kingdom for three months. This was modified afterwards, sound lean cattle being allowed to be changed to clean pastures, and cows being allowed to go to bulls when both were sound.

The same result followed this new order as its predecessors. The disease was extinguished in many counties, but lurked in others where the local authorities had been lax in looking after the execution of the order. Hence, in December, 1749, the Council admits its failure in putting down the disease, and now again prohibits all movement of cattle, except for slaughter, and the place of slaughter must be within two miles of the spot where the cattle are on the 14th of December, 1750.

The requirement that cattle should be slaughtered only within two miles of their stalls was found very grievous by London and Westminster, and the outcry raised against it by these influential places produced a revocation of it within a month of its use.

"Unfortunately," says Mr. Youatt, in his well-known work, "the restrictions with regard to the sale or removal of cattle and communication between different districts were so frequently evaded that it was either impossible or impolitic to exact the penalties." (Youatt, *Cattle, their Breeds and Diseases*, p. 391). The system of compensation was carried on for some years until the Government found it produced serious frauds. Every animal that was ailing, or had diseases of any kind, was killed and charged to the Government as having died by the plague, and in consequence of these frauds compensation was abandoned. One cause of the ill success of the repressive measures adopted is thus described in the words of Layard, who, writing even in 1757, says: "The disease, thank God, is considerably abated, and only breaks out now and then

in such places where, for want of proper cleansing after the infection, or carelessness in burying the carcasses, the putrid fumes is still preserved, and is ready, at a proper constitution of the air, or upon being uncovered, to disperse such a quantity of effluvia that all the cattle which have not had it will be liable to infection."—(Layard, *The Distemper among Horned Cattle*, p. 20).

For some time after the revocation of the Order of 1749, each county proscribed neighbouring infected counties, and refused to receive their cattle. The roads from one county to another were strictly guarded, and cattle, hides, carcasses, and tallow from any infected counties were carefully excluded. These measures, however, had but a very partial effect. Cheshire lost in the first half of 1757 and three months of the preceding year about 30,000 head of cattle, and many other counties in proportion. For the next two or three years this local war against the disease was allowed to be waged, the Government occasionally interfering when the magistrates permitted fairs in places likely to be injurious to neighbouring counties. It continued up to 1756, with considerable variations, the plague being intense in some counties, milder in others, and absent from many, until it wore itself out. There is no accurate record within our knowledge of the mortality produced by it. In the third year of the attack 80,000 head were slaughtered under the Orders in Council, and a far larger number perished by the disease. During its course it must have destroyed several hundred thousand cattle.

There was some dispute as to the means by which England received its infection in 1715 and 1745, but it is certain that the plague was raging in different parts of western Europe at that time. Wherever during war Russian and Austrian parks of cattle followed the movements of armies, the cattle plague appeared, and spread gradually to the adjacent countries. France in this way received it at least half-a-dozen times in the last century.* From 1711 to 1714 foreign authors state that western Europe lost 1,500,000 head of cattle by the plague; while from 1745 to 1748 (a period which includes three years of the great English attack) 3,000,000 are believed to have perished in western and central Europe. These figures are probably not exaggerated, considering the great losses sustained by particular States. Thus the Danish monarchy, in the four years from 1745 to 1749, lost 280,000 head, and Holland, in three years beginning with 1769, lost 395,000 head. These disasters attracted the attention of Governments and scientific men, and the long peace which began in 1816 permitted the adoption of those careful and systematic measures of precaution which, in the countries bordering on Russia, have been maintained ever since with various modifications, and, on the whole, with considerable success. It was ascertained that Europe usually received the infection through Russian steppe cattle sent into Poland and Hungary. These cattle feed in vast numbers on the luxuriant herbage of the steppes in the Russian provinces watered by the lower part of the Dnieper and its tributaries. Large herds of them are annually driven to different parts of Russia, to Poland, Galicia, and Hungary, and often carry with them the seeds of disease in their train. In 1862 the number attacked by the plague in the Austrian dominions was 296,000, of which 152,000 died. In 1863, it again invaded and overran not only Galicia, but the whole of the kingdom of Hungary and its dependencies, the Bukovina, Dalmatia, Carniola, Lower Austria, Moravia, and Styria. Fourteen per cent. of the cattle in these countries took the infection, and the average mortality, as stated in Schmidt's *Jahrbuch der Gesammten Medicin*, 1865 (p. 95), was as follows:

	Per cent.		Per cent.
Hungary.....	65	Moravia.....	88
East Galicia.....	77	Lower Austria.....	92
Croatia and Slavonia...	81.6	West Galicia.....	94
Military Frontier.....	83	Bukovina and Styria..	100

It should be added that the number attacked in the last two provinces was small.

III.

Our present experience, then, our past experience, and the

* Much interesting information on this part of the subject is contained in a memoir by M. Renault, President of the Veterinary School of Alfort, transmitted to the French Minister of Agriculture, and published in several French and English newspapers.

experience of foreign countries, coincide so far as they respectively go; they identify the English plague of 1865, the murrain of 1745, and the rinderpest of Eastern Europe, as the same disease, and they yield some clear and well ascertained results, which may be briefly stated as follows:

The cattle plague is, in the language of medicine, a specific disease, belonging to the class of contagious fevers. The contagious matter is subtle, volatile, prolific, in an unexampled degree. It is conveyed in a most virulent form in the excretions from the diseased animal. Any particle of those excretions may serve as a vehicle for it. We know not the limit of time within which it disengages itself from them, nor to what distance it may not be diffused. It may travel, we know, in the hide, horns, hoofs, and intestines of the dead animal; the offal, therefore, is highly dangerous. It lurks undeveloped in the system for a period about which some difference of opinion exists, which is certainly not less than five days—usually seven or eight, but appears to be more prolonged in some cases. Towards the end of this period of incubation, but at what precise point we do not know, it becomes capable of diffusing itself by contagion. A diseased animal may, therefore, be infectious before it shows any signs of disease, or, at all events, before the malady betrays itself to any but a very close and very skillful observer. The proportion of cases in which it is fatal is extraordinarily large. No specific has been discovered which neutralizes or expels the poison; judicious treatment may enable nature to resist till the virus has spent itself; injudicious treatment may have a contrary effect; but that is all. The practical conclusion, therefore, at which foreign physicians and foreign Governments have arrived—the conclusion that it is better always to kill a diseased animal, or a few diseased animals, where by so doing you can kill an isolated germ of disease, instead of suffering that germ to linger and fructify while you are attempting a cure, for the precarious prospect of an insignificant saving—is justified by reason; it is also directly justified by experience, which shows that, while the plague, propagated from a single germ, speedily becomes unmanageable, spreads from herd to herd, from province to province, and from country to country, multiplies in a continually increasing ratio, and exhausts itself only after ruinous havoc and a long course of time, it may be effectually eradicated by prompt and unsparring measures. The experience of Prussia is especially valuable in this respect. The plague has often appeared, says Professor Gerlach, in the provinces bordering on the Russian Empire, in East Prussia, Posen, and Silesia, but it has never since 1815 penetrated eastwards, even so far as Brandenburg. Lastly, we must add, it has not been found to give way before cold weather or rain. The reverse seems to be the case. It is worse, Professor Gerlach informs us, "in cold and wet weather, and better in warm and dry weather." "It spreads," says Mr. Ernes, "as fast in a cold as in a hot season." The murrain of 1745 broke out here in early spring, the temperature of the preceding year having been low; and it is stated to have raged most violently during the winters, and to have diminished in intensity with the advance of summer.

These conclusions, which are all that for our present purpose it is necessary to state, are far, of course, from exhausting all that is known upon the subject. Beyond what is known, however, there is a large field of inquiry which may be usefully explored. To observe carefully the premonitory and progressive symptoms of the disease under various conditions—to determine precisely the period of incubation, the effect of remedial and of preventive agencies (including under the latter head disinfectants, therapeutical measures, and inoculation)—to ascertain within what range and under what modifications the poison may be communicated from a diseased cow to other animals of the same or different species—these are branches of investigation practically important, but which will take time. With a view to the thorough examination of them, we have obtained the assistance of men eminent in various departments of science, and we hope to be able to report on them hereafter. But we have now to deal with more pressing questions. Are the measures hitherto adopted to stifle the plague at home and stop its entrance from abroad effectual for the purpose? If not, what other measures are likely to be effectual? To these questions, having early satisfied ourselves of the general character of the disease, we at once directed our attention; and the evidence which we have received has been chiefly taken with a view to them.

IV.

The preventive measures hitherto adopted by your Majesty's Government may be briefly stated.

By an Act of Parliament passed in 1848, and continued by several subsequent Acts to the present time, the Lords and others of your Majesty's Privy Council, or any two or more of them, are authorized to make from time to time such orders and regulations as to them may seem necessary for the purpose of prohibiting or regulating the removal to or from such parts or places as they may designate in such order, of sheep, cattle, horses, swine, or other animals, or of meat, skins, hides, hoofs, or other part of any animals, or of hay, straw, fodder, or other articles likely to propagate infection; and also for the purpose of purifying any yard, stable, outhouse, or other place, or any waggons, carts, carriages, or other vehicles; and also for the purpose of directing how any animals dying in a diseased state, or any animals, parts of animals, or other things seized under the provisions of the Act, are to be disposed of; and also for the purpose of causing notices to be given of the appearance of any disorder among sheep, cattle, or other animals, and to make any other orders or regulations for the purpose of giving effect to the provisions of the said Act, and again to revoke, alter, or vary any such orders or regulations; and it is enacted that all provisions for any of the purposes aforesaid in any such orders contained shall have the like force and effect as if the same had been inserted in the Act; and that all persons offending against the Act shall for each and every offence forfeit and pay any sum not exceeding £20, or such smaller sum as the Council may in any case by such order direct.

Under the powers conferred by this Act several Orders in Council have been issued, dated respectively the 24th of July (14 days after the first notice of the outbreak was given by Professor Simonds to the Privy Council-office), the 11th, 18th, and 26th of August, 1865, the substance of which was afterwards embodied in a consolidated order, dated the 22nd of September, 1865. This consolidated order contains the regulations now in force relating to England, Wales, and Scotland. Some further orders have been made prohibiting the importation of horned cattle and sheep, and regulating the portation of hides, from Great Britain into Ireland, and likewise prohibiting importation into the island and barony of Lewis.

(a.) Under these orders inspectors have been appointed by the Clerk of the Council for the Metropolitan Police District; as to all the rest of Great Britain, the appointment of inspectors is discretionary in England with the justices of each Petty Sessional Division, in Scotland with the County Justices in Sessions; within municipal boroughs the power is invested in the mayor or provost. The discretion, however, may only be exercised where the local authorities are satisfied of the existence of the disease in, or have reason to apprehend its approach to (this was added on the 26th of August), the district over which their jurisdiction extends.

(b.) Every inspector is empowered to enter and inspect all premises within his district in which any animal (this word is defined as including neat cattle, sheep, goats, and swine) may be found, to seize, slaughter, and bury animals diseased, and to disinfect the premises, and to order the separation of animals suspected of being diseased.

(c.) Owners of diseased stock are forbidden, absolutely, to send to market or expose for sale, to send by highway, railway, or coasting vessel, or, lastly, to turn out on common or unenclosed land any diseased animal. If within an inspector's district, they are also forbidden, without the inspector's leave, to remove from their premises any animal which is diseased or has been in the same shed or herd, or in contact with a diseased animal; or to place any diseased animal in any field or pasture where, in the inspector's judgment, it would be likely to propagate the disorder.

(d.) The local authorities may, by published notice, exclude all animals, or any specified description of them, from any fair or market within their jurisdiction; and no animal is to be sent to the Metropolitan Cattle-market so long as the plague exists within the metropolitan police district, "except for the purpose of being there sold for immediate slaughtering, and every such animal, as soon as sold, shall be marked for slaughter in the same manner in which cattle are ordinarily marked for slaughter in the Metropolitan Cattle-market." The two latter provisions date from the 22nd of September,

Inspectors have been appointed under these orders in a large number of districts. Cattle landed at the port of London, or at any of the outports, are inspected on landing by inspectors appointed by the Board of Customs, who are now veterinary surgeons, except in a very few cases where no veterinary surgeons can be procured.

These orders have not arrested the march of the plague, nor can we persuade ourselves that they will materially serve to arrest it, now that it has spread so widely.

Inspection is the instrument on which the chief reliance is placed. But it is not enough to clothe an inspector with the most ample powers as to diseased cattle if he cannot certainly know whether a beast is diseased or not. During the period of incubation, as the evidence shows, even a skilful practitioner may be at fault. Nor are we by any means sure that in all the infected districts a sufficient number of competent persons have been found skilled in the diseases of cattle. The demand has been sudden. We have reason to doubt whether it has called forth an adequate supply. At any rate, many cases have been brought to our notice in which tradesmen or others without professional qualifications have been charged with this office. It must be added that an inspector, set to fight single-handed in his own district against this insidious enemy, with a private practice, and among farmers and butchers to whom he looks for employment, has a hard task to perform, and is likely to find their motives and opportunities for concealing the disease more than a match for his means of detecting it.

An important step was taken by prohibiting stock from being sent to the Metropolitan Market, except for immediate slaughter. But how is this prohibition enforced? The beast, if sold, is marked by clipping the hairs of his tail, and this is understood to mean that he is marked for the butcher. But such a mark is sure to lose its significance as soon as the regulation becomes notorious; and, significant or not, there is nothing in it to prevent him from being carried into the country, turned out to graze, or resold, while unsold animals are not marked at all. Cases of this kind, where the animals carried infection with them, have been brought to our notice. In fact, of all the cattle which are sent from the country into London, about one-third, after having stood in the market, are distributed again from London over the country.

The discretionary power given to local authorities of closing wholly or partially fairs and markets is still more important, provided it be exercised generally, promptly, and firmly. But, in the first place, such a power is not proper to be intrusted to mayors of boroughs and justices of petty sessional divisions. Wider interests are concerned than these little circles enclose. The mayor of a town, to which its market brings large and regular profits, is not the fittest judge of the expediency of closing that market before it becomes a source of infection to the surrounding rural district. All justices are not equally firm, equally ready to do an unpopular thing, equally convinced of the magnitude of the calamity. A large number of markets and fairs have, it is true, been closed, one by one, against lean or store cattle; the example once set has been gradually followed. But what has been done has not been done uniformly. In some places all fairs and markets for both store and butcher's stock have been stopped; in others those for store stock only. The periods of stoppage also have been very various. Here, however, uniform action is everything. Restraints on the ordinary course of business and traffic must be of brief continuance if they are to be strictly enforced; they must be sharp and sweeping if they are to be brief. What is necessary to be done should be done at the same time, wherever it is necessary, or it might almost as well not be done at all. In the second place, the prohibition is easily evaded, and does not go far enough for even its limited object. It is evaded (this also has been repeatedly urged on us) by auctions and other public but unauthorized sales, conducted without even those imperfect checks and safeguards which exist at a market or fair.* Small jobbers, too, we are informed, are beginning to roam the country with droves, out of which they supply customers who are not nice as to what

* A later order, issued on the 31st of October, prohibits, wherever fairs or markets have been closed, by the local authority, the "bringing or sending" of any animals to any place for the purpose of exhibition or sale, and the receiving, exhibiting, buying, or selling of animals so brought or sent.

they buy. It would be difficult to invent means better adapted to sow infection broadcast.

We are convinced, then, that other measures are required. We proceed to consider what those other measures should be. In doing so we shall endeavour to point out clearly the general course which we think should be pursued, without entering into details, which more properly belong to your Majesty's Government.

V.

We are perfectly sensible that this a question of extreme difficulty. The difficulty lies in the magnitude of the sacrifices we have to call for, the inadequate notion which prevails of the extent of the evil to be subdued, the facilities for dishonest evasion, and the risks from inadvertence which spring up with every attempt to mitigate those sacrifices. For it must be observed that we have not merely to guard against criminal or unscrupulous acts; nothing is easier than for a man, without being guilty of so much as gross negligence, to become the means of spreading infection over a whole county.

Let us first say a word about the system employed with so much success in Prussia; we mean the system of *cordons*, by which infected places are isolated, and the disease either suffered to exhaust itself or stamped out by indiscriminate slaughter. Nothing can be more efficacious where the disease is confined to a very few points; but in order to be efficacious the isolation must be complete and must be soon over, and slaughter (as the Germans themselves hold) is merely wasteful where the number of animals is large. When the disease has widely diffused itself, and disappears at one point only to appear at another, the difficulties of isolation become greater and the chances of its being efficacious less. We need hardly add that in countries accustomed to a strict half-military police and the constant presence of soldiery, where men and cattle are lodged in close-packed villages encircled by tracts of open ground, and where the system itself is so well known and the necessity for it felt, it finds facilities which would be wanting among our lanes and scattered homesteads, with a people to whom it was novel, and who are unused to restraints and jealous of interference. These considerations are by no means conclusive against the application of it, with some modifications, to England, far less against resorting to it in Ireland, but they warn us against expecting too much from it, or relying on it alone.

Against a disease which is highly contagious, undiscoverable at a certain stage, and too widely diffused for an army of inspectors to cope with it, there is clearly but one remedy which would be certainly and absolutely effectual. That remedy is to prohibit everywhere for a limited time any movement of cattle from one place to another. Enforce this, and within a time which cannot last very long the disease is at an end. It must stand still, and it must starve for want of nutriment. This great sacrifice would certainly eradicate the evil; we cannot say so of any sacrifice less than this.

We are perfectly sensible of the vast train of losses and in conveniences, public and private, which must attend upon such a measure; and the possibility of mitigating them by circumscribing the prohibition in different ways, without rendering it ineffective, is a point to which we have given the most anxious consideration.

The distinction which may be drawn between lean and fat stock, or rather between cattle moved from place to place for the sake of grazing or fattening, and cattle moved with a view to immediate slaughter, here suggests itself at once. In the case of store stock the risk of propagating infection is, on the whole, great, and the evil of stopping circulation is less. The farmer who has lean animals to dispose of, and the farmer who has winter food for them to consume, must undoubtedly suffer; and there might be reason to apprehend some diminution in the supply of winter-fed stock for the spring and early summer of next year. But it must be remarked that the fear of infection now deters many farmers—in infected counties, indeed, all but the very needy or the imprudent—from buying at store markets; and that the persons who would lose most by the application of the remedy are also those who are most deeply interested in the matter, and will be the greatest losers if no effectual remedy is found. We have little difficulty, therefore, in arriving at the conclusion, not only that public sales of lean stock should be suspended for a time, but that private sales, over which it is impossible to exercise an effective control, should be stopped likewise.

On the other hand, to interfere with the circulation of fat stock is to interfere directly with the meat market; and to embarrass it, is to raise, for a time at least, the price of meat. To require that every bullock sold for slaughter shall be slaughtered on the premises of the seller will, undoubtedly, in a multitude of cases be inconvenient to both farmer and butcher. There will be difficulties about the actual slaughtering, about the disposal of hides and offal, about transport; and these difficulties appear still more serious when we consider the manner in which the live-meat trade is now carried on, through salesmen and jobbers, and the vast quantity of fat cattle continually in motion to and from London, and from one market to another. A large system of trade and transport will have to be deranged, and many new arrangements to be made, and the cost of effecting these changes on the spur of the moment must fall, to a considerable extent, on the consumer of meat.

If the distinction be admitted, however, many other questions arise. In the first place, how is it to be enforced? If a privilege is conceded to cattle destined for the butcher, how are we to make sure that a particular animal is really destined for the butcher, or that he will be slaughtered immediately or slaughtered at all, or that he will not scatter infection on his road? May he be driven home by the nearest country butcher who will buy him, or must he be sent to market? May he go to any market, or only to one where conveniences for slaughtering and for careful inspection are or can be provided? May he, if unsold, be sent home again, or transported from one market to another; or if not, what chance will the seller have, should the market be overstocked, of making a fair bargain? In considering these points it must be borne in mind that a butcher has, as some witnesses have remarked to us, facilities which a farmer has not for concealing the presence of the disease, and that he has not those motives for being on his guard against it which the farmer has. A farmer who brings home a diseased animal may probably lose his whole herd. But it is often the butcher's interest to ask no questions.

Answers more or less complete may be furnished on all the points above enumerated, and precautions may be devised with a view to each of them. In general terms it may be stated that such precautions must be in the main rest on some or all of the following expedients:—On a modified adoption of the *cordon* system; on the imposition of new and peculiar legal obligations upon butchers, and probably upon drovers, railway companies, and the authorities in charge of markets; lastly, on a system, more or less extensive, of permits, certificates, or declarations. We ought not, however, to shrink from distinctly saying that no answers can be given which, in our judgment, are perfectly satisfactory, and no precautions invented on which it is possible entirely to rely; and that we believe it to be best for the country, and even for the interests which will suffer most in the first instance, that the prohibition against the circulation of cattle should be maintained in its integrity.

We have stated frankly the difficulties and sacrifices for which the country must be prepared should this proposition be carried into effect. Of these difficulties the one which will probably be felt most strongly relates to the supply of food to the great towns. Fears have been expressed that to close the Metropolitan-market, for instance, against the influx of cattle from the country would create a famine. We have already seen that the attempt to restrict the markets of London and Westminster during the plague which raged here in the reign of George II. was given up on account of the clamour which it created; and it may be argued that the same thing would happen now. Circumstances, however, have widely changed. In the days of George II. meat could only be transported to London alive; even the roads along which the cattle travelled were what we should now think few and bad; there was little importation from abroad, and some difficulty must have been often found in supplying the wants of the metropolis by the ordinary means of communication. Now, every place where fat cattle are fed in large numbers is approached by railways, which can transport dead as well as live meat; and it seems no unreasonable demand to require that, for the sake of averting a calamity of almost incalculable magnitude, London should be content to be supplied with dead meat from the provinces, instead of constituting herself a hotbed of infection by receiving twice a week great throngs of living cattle. This

change is, indeed, in itself economical and advantageous, and appears to be gradually taking place as a natural consequence of the extension of the railway system. There is obviously an immense waste of labour in bringing the live animal to London in order that certain portions of its carcass may be consumed as human food; dead meat is more easily carried than the living creature, and it seems quite as reasonable to carry the butcher to the ox as to bring the ox to the butcher. We are informed that from Aberdeen alone upwards of 1,000 carcasses are sent up weekly to the English metropolis during eight months of the year, and 300 or 400 during the remaining four months, and that special dead-meat trains leave Aberdeen on this errand five days in the week. Nor is it to be forgotten that London is at the present moment fed in a great measure with foreign cattle. From the 16th of September to the 18th of October last, both inclusive, the number of English beasts in the market was but 11,615 to 20,185 foreign. It must further be observed—and this is the most important point—that a general prohibition is capable of being thoroughly enforced. The mere presence of a beast on any highway will be sufficient to prove the infraction of the rule. Any plan which, while laying down the general prohibition, admits exceptions in favour of cattle removed to particular places or for particular purposes, must rest upon the ascertainment of facts more or less complicated, to be proved by certificates from local authorities, upon the accuracy of which, experience warns us, little reliance can be placed. The liberty to remove cattle for particular purposes is sure to be extended and abused for other purposes. A man has only to profess an intention in accordance with the law, in order, by a little dexterity, to obtain under such a system the utmost facility for violating the law. It will be a long time before the rules are understood, and the period in which they are violated through ignorance will be succeeded by the period in which they are evaded by design. England is probably the worst country in the world for the working a system of certificates, permits, licences, and passports; and the temptation to violate the rules will be very great, for the thought that naturally occurs to everyone whose herd is attacked is to conceal the existence of the disease until he has got rid of those animals which do not yet show symptoms of its presence. To the objection, true as far as it goes, that the embarrassment thus thrown in the way of trade will probably tend to raise the price of meat, it may be answered—first, that such a rise in the price of meat will afford at the expense of the community the means of reimbursing the trade for the sacrifices it has made for the common benefit; and, secondly, that the immense destruction of cattle which such a measure is alone calculated to prevent is likely to raise the price of meat to a higher point, and for a longer time, than a regulation which really does little more than change the place of slaughter from large towns to country districts and places of importation. In the period from 1745 to 1757 almost every measure, short of the one which we are considering, was tried in vain. The disease at first advanced slowly, but it lasted twelve years, and then died out, apparently for want of animals susceptible of its influence, although the difficulty of communication from one part of England to another offered at that time the fairest chance for the success of palliative measures. England has now to contend with the plague under disadvantages never experienced by any other country. The density of her population, the large quantity of her horned stock, and, above all, the enormous facility of communication by railroad, make her peculiarly liable to the ravages of a contagious disorder, and render the prospect of eradicating it within any reasonable time, either by slaughter or by curative and disinfecting measures, almost hopeless.

RECOMMENDATIONS.

1. SUSPENSION OF CATTLE TRAFFIC IN GREAT BRITAIN.

For the reasons stated above we feel ourselves compelled to recommend to your Majesty that such measures shall be taken as may be requisite to invest, with as little delay as possible, some high officer of your Majesty's Government with the power of suspending for a limited time the movement of cattle from one place in Great Britain to another, for extending or shortening such period, and for renewing the prohibition as often as circumstances may render necessary.

1a. SUGGESTED REGULATIONS AS TO CATTLE TRAFFIC, SHOULD RECOMMENDATION 1 NOT BE ADOPTED.

We believe that this measure offers, as we have already said the only certain means of eradicating the disease, and we conceive that the end amply justifies us in proposing to the nation so great a present sacrifice. In submitting this, however, as our first recommendation to your Majesty, we are well aware that it is likely to excite much opposition; that the difficulties to which we have adverted may to some appear insurmountable, and that to those who do not regard the cattle plague in so serious a light as we do the remedy may seem worse than the evil. This view may possibly be shared by your Majesty's Ministers; we think it right, therefore, to go further, and to indicate the measures which might, in our opinion, be advantageously adopted, should an absolute suspension of the movement of cattle in Great Britain not be enforced.

a. For a period to be fixed, and which might, if necessary, be extended, no lean or store stock should be permitted to be sold at any fair or market, and sales of such stock by auction or advertisement, or in any other manner whatever, should be prohibited.

b. Cattle might be moved for immediate slaughter to a market or to a slaughterhouse licensed for use, but only under a licence for transit granted by the magistrates in Petty Sessions. The licence for transit should certify to the healthiness of the district from which the cattle come. With this exception, and except in the case of cattle driven from one part of the same farm to another, the transit of cattle over any public road (including railways), or in any coasting vessel, should be absolutely prohibited.

c. Precautions should be taken that every animal sold for butcher's meat be slaughtered within a short and fixed period. It may be convenient for this purpose that no slaughterhouse should be used without a licence from the local authorities, and no such licence given except on the butcher's undertaking to have all cattle which may be sold or consigned to him driven direct to the slaughterhouse or premises attached to it, from whence they are not to be moved alive. Cattle sold at a fair or market should not be allowed to leave the precincts of the borough or other place where the fair or market is held (in the case of London, the Metropolitan Police District) alive. To ensure this object, it might be required that cattle entering a fair or market should be branded or marked on entrance, and cattle sold elsewhere to a butcher similarly marked at the time of sale, and that it should be penal for any one but a butcher to have a marked animal in his possession. If any regulation of this kind is adopted, it would be advisable that in every place where a public market is held, hairs should be provided in which unsold animals could remain from one market-day to another.

d. It would be desirable to draw some more distinct line between infected and uninfected districts than is at present traced by the orders in Council. For this purpose, whenever a case of infection is discovered, or is known to have existed within a certain period before the time when these measures may come into operation, the district should be "proclaimed" as infected in the *Gazette* and the county papers. The egress of live cattle from a proclaimed district should be strictly prohibited, but cattle slaughtered within it and certified by the district inspector to be fit for food might be sent out of it, under proper safeguards for disinfection. Provision should be made for enabling districts which had been proclaimed to be publicly set free, on proof being furnished that all risk from infection was at an end.

This latter proposal would, if adopted, strengthen the inducements of the inhabitants of infected districts to rid themselves of the disorder, and those of their neighbours to watch vigilantly against its approach.

2. POWERS OF INSPECTORS.

We are of opinion that the power to seize and slaughter vested in inspectors by the Consolidated Order may properly be withdrawn; or that, if retained, it should be exercised only in cases where the inspector's directions as to the separation of sound from diseased stock, &c., or any general preventive or sanitary regulations issued by the Government, are not complied with. This power is right and useful when the disease has appeared only at isolated spots and attacked a few animals; the public benefit is then very great, and the private sa-

crifice small; but in proportion as it extends, the hope of thus arresting its march diminishes, the inevitable waste increases, and the sense of hardship tends to become insupportable. In principle, a system of compulsory slaughter should be complemented by a system of compensation, and the objections to promising compensation to individuals out of the public treasury on an extensive scale appear to us insurmountable.

3. FOREIGN CATTLE.

No reference has hitherto been made to cattle imported from abroad. Should our first recommendation be entertained, and an absolute embargo placed on all traffic in cattle within Great Britain, we think that imported cattle should be slaughtered at the ports of landing. We are further of opinion that cattle should be allowed to land at certain ports only, where proper facilities can be afforded for inspection and transport. In the other alternative, it will be sufficient to say that foreign cattle, if passed by the Customs' inspectors, and not coming from an infected district, may be sent by railway to any market in Great Britain, but shall be then subject to the same regulations as British cattle.

4. UNINCLOSED LANDS.

During the period of prohibition, whether absolute or limited, no cattle should be allowed to be turned on common or uninclosed land.

5. PERIODICAL RETURNS.

It is highly desirable that steps should be taken for obtaining periodical returns of the horned cattle and sheep within the area of every parish of Great Britain, and of their sanitary condition, with especial reference to the present disease.

6. IRELAND.

Before this Report is concluded, some reference should be made to the peculiar circumstances of Ireland. The disease not having as yet broken out in that country, there is no necessity for the measures which have been recommended for Great Britain. It is still possible, by the adoption of suitable precautions, to avert the calamity from Ireland altogether. The importation of cattle into that country has already been prohibited for some weeks past. Considering, however, the destructive character of the disease, it will not be judicious to rely upon that precaution alone for escaping it. The evidence which has been laid before us leaves little doubt that it can be conveyed by persons who have been in contact with infected animals, as well as by the animals themselves. In case it should, by any accident, be carried over, the Government should be in readiness to eradicate it from any spot in which it may appear; and unless preparations are made for doing so before the plague shows itself, the authorities will hardly be in a condition to act with the necessary speed and vigour when the emergency arises. In Prussia, upon whose eastern frontier the disease frequently appears, a system of precaution has been adopted for stopping its further progress, which has hitherto met with invariable success. It would probably not be difficult to make provision for the application of similar measures to Ireland, and so to secure to it a permanent immunity from the calamity under which Great Britain is at present suffering. But the extreme rapidity with which the disease spreads makes it important that all arrangements for stamping it out, in case of its possible appearance, should be made without delay.

We append to this Report a short series of practical suggestions, drawn up by those members of the Commission who are professionally qualified to deal with sanitary subjects, and which may be useful at the present time to owners of cattle.

ROBERT LOWE. E. A. PARKES.
LYON PLAYFAIR. THOS. WORMALD.
RICHARD QUAIN. ROBERT CEELEY.
Oct. 31. CHARLES SPOONER.

The following is a separate Report of Earl Spencer, Viscount Cranborne, Mr. Read, and Dr. Bence Jones:—

We are unable to join the other members of the Commission in recommending the total stoppage of all movement of cattle in Great Britain. It is true that, if such a measure were practicable, it would be more effectual than any other in extirpating the disease. But we do not believe it to be practicable. It would involve an interference with the course of

trade at variance with our national habits; and it would demand sacrifices from large numbers of people, who are removed from the presence of the disease, and who will, therefore, not see the necessity for so stringent a measure. The sudden transformation of the enormous cattle trade, by which the large towns are supplied into a dead-meat trade, would involve difficulties and dangers of the most formidable kind. The foreign trade, which at this moment furnishes a considerable proportion of the meat consumed in the large towns, would also be seriously interfered with. The price of meat would, in consequence, rise materially and suddenly.

These difficulties would lead to the evasion of the prohibition; and if it is largely evaded, as we think probable, it will be worse than useless.

We prefer, therefore, the measures of a less stringent character, which are recommended as an alternative in the above Report. They demand no greater sacrifice than will readily be made to arrest the progress of so serious an evil; and, therefore, we believe that they are likely to be thoroughly carried out.

In the other recommendations of the Report we heartily concur.

SPENCER. CLARE SEWELL READ.
CRANBORNE. HENRY BENCE JONES.

We are of opinion, however, that store animals may be permitted to move from the farm of the seller to that of the buyer, provided they have a certificate from a justice of the peace acting in the district where the sale takes place, showing that they are free from disease, and that they have been located for a certain time on the farm of the seller.

Oct. 31. SPENCER.
CLARE SEWELL READ.

The following is a separate Report of Mr. McClean:—

I dissent from the Report on the following grounds:

I consider that the magnitude of the calamity against which it is intended to guard in no way justifies the interference with the traffic in cattle which the Commissioners in their Report recommend, and that the evils which would arise to the community from even a limited prohibition of the movement, or of the importation of foreign cattle, would far exceed the losses which may arise from the prevailing disorder.

By the last return issued by the Veterinary Department of the Privy Council-office—which, as regards the number of animals which have died of the cattle plague, is correct, and, although not strictly accurate in other respects, may be considered fairly to represent the progress and present extent of the ravages of the disease—it appears that up to the 21st of October, 1865, a period of rather more than four months from the time when the disease first appeared in Islington, 14,083 animals had been attacked; that of these 6,711 had died, 5,119 had been slaughtered, 707 had recovered, and 1,546 remained under treatment.

The estimated number of horned cattle in Great Britain is about 7,000,000, so that less than one per 1,000 of such cattle have died of the disease in four months, or about one per day for every 116,000 head.

During the same period of four months, sound and healthy cattle, of the average value of (say) £15 15s. per head, have been imported from foreign countries at the average rate of 1,000 per day, so that by the operation of the present system, involving careful inspection at the ports of landing, the gain to the country has been 166 sound cattle for each one that has died of the disease.

The growing necessities of the community in the matter of animal food, and the comparatively trifling extent of the injury hitherto inflicted by the disease, do not justify any exceptional legislation or any systematic interference by Government with the trade in cattle, a trade which, taking its position among the other great branches of national industry, must be subject to its own peculiar risks and liabilities.

The existing Orders in Council, enforced by the exertions of landowners, farmers, and graziers who have embarked their capital in the trade, appear to be sufficient for its protection; while by insurance or otherwise the parties interested should

indemnify themselves against loss without appealing to the community to interfere for the preservation of their property by exceptional legislation.

Since the year 1750 the circumstances of the country and of the cattle trade have entirely changed, and no comparison can fairly be instituted between its state at that period and the present time.

In the year 1750, and the subsequent years of the cattle plague, the trade in cattle was one of the principal industries of the country, and any loss sustained by the owners was almost irremediable, as there were then no available means of importing cattle from foreign countries for supplying the people with animal food.

In 1864, circumstances were very different. In that year the computed net value of the articles imported into the United Kingdom was nearly £275,000,000, of which upwards of £40,000,000 was for alimentary supply, exclusive of spirits, wine, tobacco, and other exciseable articles.

During the same year the computed net value of the articles exported was £212,656,542, making a total value of £187,520,468, while the amount of all descriptions of property and profits assessed to the income-tax was £326,775,501, about one-ninth of which was for occupation of land, and probably not so much as one-eighteenth was due to pastoral occupation.

The estimated value of property which it is proposed to protect by penal laws and quarantine regulations, to be carried out at the expense of the community and to their serious loss, inconvenience, and certain discontent, is about £60,000,000, or about one-eighth of the annual value of the national imports and exports.

The importance of the cattle trade, as compared with the other branches of national industry, is much less in 1864 than it was in the year 1750, while numbers of the people, their wealth, and means of purchasing animal food have greatly increased.

The consumption of animal food is not now confined exclusively to the wealthy, but it has become the necessary food for the working-classes, and the use of it is so general that so long as the disease can be discovered at a period when the flesh of the animal is perfectly good and fit for human food, it is impossible in this populous country for the disease to spread to any great extent, as all beasts showing the slightest symptoms of disease would be immediately slaughtered by the owner for his own protection.

As the demand, as shown by our imports of cattle, is greater than the home supply, there would only be partial loss when lean cattle had to be slaughtered.

The opinions expressed by witnesses of experience on the proposal to supply London exclusively with meat killed and brought from a distance were not favourable to the plan.

It is further to be considered that any prohibition to the importation of foreign cattle would affect and derange the whole of our commercial relations and means of communication with foreign countries.

It would create distrust at home and abroad as to the safety of investing capital in establishing, by steamboats and otherwise, cheap and regular routes by means of which food is provided for the community.

It would deprive the foreigner of an important exchangeable commodity, in many cases the only one he has to offer, and possibly lead foreign Governments to impose restrictions on the export of any food from their respective countries that might prove very detrimental to this kingdom.

The farmers of Great Britain cannot produce food enough for the people. Agricultural produce, including cattle, meat, butter, poultry, &c., to the value of more than £10,000,000 sterling has to be imported yearly from beyond the seas. Any legislation which should interfere with this supply, and the employment of the means which at great expense have been provided for its conveyance to this country, would inflict an incalculable amount of injury, and would occasion great and immediate suffering to the labouring classes, many of whom would be thrown out of work, while the price of provisions would be enhanced, and many of them now able to use animal food would be deprived of it. This would interfere with the value of labour, and with our means of competition with other countries by increasing the cost of our manufactures.

With these facts and considerations before me, and after carefully considering the nature and extent of the present dis-

order in cattle, I am of opinion that it does not at present justify any further restriction in the movement or trade of cattle, and that the powers now vested in Her Majesty's Privy Council are sufficient to prevent the spreading of the said disorder, and to avert any future outbreak of it.

Oct. 31.

JOHN ROBINSON M'CLEAN.

The following is a supplement to the Report :—

SANITARY RECOMMENDATIONS.*

On the subject of preventive and medical treatment the Commissioners have received, both from this country and from abroad, discouraging but decided evidence that all methods hitherto adopted have been found unsuccessful. Nevertheless, being of opinion that medical science may still be able to discover agents capable of mitigating the virulence of the malady, the Commissioners have drawn up a scheme of investigation into the nature of the disease, and have intrusted different inquiries to scientific men of great skill and ability, who will make reports on the subjects intrusted to them at the earliest possible moment.

In the meantime a few sanitary suggestions may be offered, which are calculated to be useful to farmers and dealers in cattle. These may be divided into the following heads :—

I. The general precautions which should be taken by cattle owners to prevent the spread of the disorder.

II. The special precautions required when the plague is in the neighbourhood.

III. The measures, preventive and remedial, which should be taken when the plague breaks out in a locality.

IV. Measures for disinfecting sheds and cattle which have been infected.

I. GENERAL PRECAUTIONS TO PREVENT THE SPREAD OF THE DISORDER.

1. As no successful plan of treatment has yet been proposed, the owners of cattle must, in the meantime, rely chiefly upon those hygienic measures which the experience acquired in other diseases show to be important in preventing the spread of contagion, and in diminishing the intensity and area of an attack, when, in spite of such measures, they invade a locality hitherto uninfected. In the case of the cattle plague it is certain that no sanitary precautions can prevent the spread of the disease when it is actually introduced: still, from analogy, we may draw the conclusion that some effect may be produced on the rapidity of the spread or on the virulence of the disease, by placing cattle in the conditions most favourable to health.

2. With this view it is important to secure strict cleanliness, good drainage, efficient ventilation, and to prevent overcrowding in all cattle sheds and cowhouses. No accumulations of litter fouled by the voidings of animals should be permitted in, or even close to, the houses or sheds in which cattle are kept. Chloride of lime, carbolic acid, or the powder containing carbonate of lime and sulphite of lime should be used. The latter is probably the best; it contains a well-known disinfecting substance which is formed when sulphur is burnt, and also a strongly antiseptic material, kresote, from coal-tar. The sheds themselves should be swept and washed daily, and sprinkled with disinfectants. But such purification of the air of cattle-sheds or houses will be insufficient to preserve health if the cattle be overcrowded. Pure air and nourishing diet are of great importance in protecting animals from the attacks of disease. Pure water, derived from sources uncontaminated by drainage from surrounding dunghoops, or from the absorption of vitiated air which hovers around them and in the sheds of cattle, is equally essential.

Every farmer should look to the housing of his cattle in the present emergency, as he would look to the housing of his own family, if cholera or other formidable disease were in his neighbourhood. Thorough cleanliness of the houses, good drainage, freedom from evil smells, nourishing diet, with pure air and water, cannot give immunity from the disease; but they may offer obstacles to its propagation.

* Suggestions in the sense of many of these recommendations have been already drawn up by Professor Simonds and by Dr. Thudichum for the Privy Council, and have been circulated.

II. SPECIAL PRECAUTIONS NECESSARY WHEN THE DISORDER IS IN THE NEIGHBOURHOOD.

Whenever the plague is known to be in the neighbourhood, or to be approaching it, the following conditions must be borne in mind:

1. The natural voidings of a diseased animal, as well as the discharges which come from its mouth, nose, and eyes, during the progress of the disorder, can be carried by men and animals, so as to infect sound cattle; and in this way the disease is often propagated. A farmer should therefore at once give orders that none of his own labourers should go near infected beasts, and that none of the labourers working on the farm where there are diseased cattle should approach his stock. Even when veterinary surgeons visit cattle affected with the plague, they should, if they have been with diseased beasts, first thoroughly cleanse their clothes, wash their hands in a solution of chloride of lime, and rub the soles of their shoes with disinfecting powder.

2. Both sheep and dogs can carry seeds of the disease, so that they should be carefully looked after, lest, in having access to diseased cattle, they may attach to themselves portions of excrement or discharges, and communicate the contagion to sound cattle. The farmer will do well to recollect that both sheep and goats take the plague in a virulent form, although they are not, perhaps, quite so susceptible to the influence of the contagion as horned cattle; but even when they do not take the disorder, the wool of the sheep and the hair of goats can long retain the morbid matter, and then transfer it to cattle.

3. The particles of the poison can be drifted by the wind to some distance, experience having shown that a space of considerably more than a hundred yards affords no protection. Therefore, if a farmer has the opportunity, he should remove his stock to the furthest possible distance from that of his infected neighbours.

4. If a farmer have reason to think that some of his beasts may have been near infected animals, he should at once wash them over with the solution of disinfecting soap or with a tepid solution of chloride of lime, carefully sponging out the nostrils and mouth, so as to remove all portions of discharges which may have been collected.

5. He should vigorously attend to the hygienic measures described in the last section.

III. PREVENTIVE AND REMEDIAL RECOMMENDATIONS, WHEN THE PLAGUE HAS ATTACKED A LOCALITY.

1. Should, unfortunately, the plague reach the farm or cowshed, it will be the cattle-owner's duty to separate, without delay, the diseased from the sound stock. At once, and before any symptoms of the malady have appeared in the animals which may have been in contact with the diseased beast, he should place them in roomy, well-cleansed and dried, well-aired and disinfected sheds, having previously washed their bodies with water containing disinfecting soap, or with a tepid solution of chloride of lime. He will thus place them in the best condition to resist the further spread of the disease. But if he do not possess the necessary accommodation for the removal of the healthy animals, he ought, after separating the diseased beasts, to make a thorough disinfection of the house or shed, in the manner to be described afterwards, before he permits the sound stock to remain in it.

2. The sick beast, if allowed to remain alive, should be well rubbed down and thoroughly cleansed, be kept in a warm but well-ventilated and clean shed, and be covered with a clean horse-rug. The animal will thus be put in a favourable condition to receive such curative treatment as the veterinary surgeon or farmer may consider it expedient to employ.

3. Having failed to obtain any assurance of the existence of effective methods, the Commissioners only venture for the present to indicate some general suggestions as to diet and treatment, which may be useful to farmers.

a. Kind of Food.—One of the early symptoms of the disease is that the appetite fails and rumination ceases. When a dissection is made of an animal that has died of the plague, the stomachs are usually found to contain from one hundred to two hundred pounds of undigested food. This mass of matter interferes with the functions of nutrition in the case of new food, and, further, hinders the action of medicine which may be administered, by greatly retarding its absorption. As

soon, therefore, as the beast shows the early symptoms of the disease, its ordinary food should be changed; and, as rumination has stopped, the dry food should be replaced by warm liquid stimulating mashes given in moderate quantity.

b. Warmth of the Air.—It is stated that the temperature of the air of the stall should be kept warm; probably not lower than 60 deg. Fahr.

c. Warmth to the Skin.—It is desirable to keep the skin of the animal as warm as possible, and, if it can be done, to promote perspiration. Without expressing any decided opinion as to the exact efficacy of steam or hot-air baths, we yet believe the evidence is sufficient to warrant a fair trial of these measures.

d. It is important to lose no time in beginning the treatment of the complaint with salines or diaphoretics, or even stimulants, according to the judgment of the veterinary surgeon as to the state of the disease. Every hour that is lost lessens the chance of a successful result. After cattle have been exposed to infection, some veterinary surgeons consider it useful to give saline and febrifuge medicines at once, even though it is not certain the animal has taken the disease.

e. When diarrhoea occurs, there seems little doubt that it should be controlled, and not encouraged.

f. The animal must be supported as much as possible by very nutritious food.

g. Milking cows should be regularly milked as long as any milk can be got. The milk, of course, should not be used as food.

The general diffusion of the disorder through the system leaves little hope that any local treatment is likely to prove effective.

When the animal shows signs of convalescence it should only be very gradually restored to the dry food requiring rumination. It may be treated with moderate stimulants and tonics, among which bark and iron are considered to be the most efficacious.

IV. MEASURES FOR DISINFECTING INFECTED SHEDS AND CATTLE.

1. When animals attacked with the plague have become convalescent, they ought to be kept apart from sound beasts for three weeks, and even then not be permitted to associate with them till they have been washed and disinfected as described previously.

2. During all the time that animals suffer from the disease, the litter fouled by them, with the dung and discharge on it, should be burned, and not be allowed to mix with other manure. It contains the poison in a concentrated form, and it is questionable whether it can be disinfected efficiently.

3. The sheds in which the diseased animals have been must be thoroughly purified and disinfected. The roof and walls should be washed with lime. The floor and woodwork, after being thoroughly washed with water containing washing soda, should be again washed all over with solution of chloride of lime, containing 1lb. to a pailful.

4. The hides and horns of animals which have died of the disease ought to be buried with the animal, according to the Orders in Council. But the hides and horns of those which have been killed to escape the spread of the infection must be dipped in, or thoroughly mopped all over, and, in the case of the hides, on both sides, with water containing 4lb. of chloride of lime to three pailfuls of water. Unless this be done with care a most fertile source of contagion will be preserved.

5. The attendants upon diseased beasts should not be allowed to go near the sound animals in the same farm.

6. Every one who has had the plague in his premises should feel the responsibility which rests upon him to destroy, by careful cleansing and disinfection, every trace of the disorder which may be left on his pastures or stalls, or on his cattle, their horns, hides, manure, and litter. Under favourable circumstances for its preservation, the contagious poison has been kept, with all its virulence unimpaired, for many months. Unless therefore each person uses his utmost effort to extinguish the seeds of the plague which lurk about his farm, they may become a centre of contagion, which will again spread it abroad through the country, and render unavailing the sacrifice necessary for the speedy suppression of this terrible scourge.

ARE SHEEP LIABLE TO CATTLE PLAGUE?

THE VETERINARY SURGEONS AND THE PRACTICAL MEN.

At a numerous meeting of the members of the Wayland Agricultural Society, for the purpose of discussing "The nature and cause of the disease now prevailing amongst lambs, and whether or not such disease is analogous to the cattle plague,"

The Chairman, Mr. T. BARKON, said: They must all have been startled by the statement of Professor Simonds, which appeared on the 25th of September last. He, at any rate, was startled, because he thought that if it were true that their flocks were subject to the same disease as their herds, and would have to be handed over to the inspectors for wholesale—he was going to say indiscriminate—slaughter, the agricultural sun of England would be almost totally eclipsed. He hoped, however, for better things, and that the *rinderpest* would not be found to prevail among sheep; and though he saw in that day's papers reports that seemed to favour the idea that the disease among sheep was the same as among cattle, he was glad to say that the learned men who were investigating the subject asserted that it would never be so fatal among sheep as it was among cattle.

Mr. H. WOODS, who rose at the call of the Chairman, said, he had no doubt he had been called upon from the fact that he had taken some interest in the disease that was said to have existed at Crown Point. When first he saw Professor Simonds' letter in the *Times*, he was necessarily, like a great many others, somewhat alarmed, for he there learnt that there was a possibility of the disease being carried through their flocks, that agricultural distress would be very great, and that no one could tell where it would end. On the other hand, he felt that if the disease did not exist, people's minds were in such a state that a panic might arise, and no one could tell what would be the end of that. He, therefore, felt it a duty which he owed to himself and others entertaining these feelings, to make some enquiry as to the symptoms shown by Mr. Harvey's sheep. He did so, and was satisfied from what he was able to gather, that there were great doubts as to whether it was the cattle plague which existed among those sheep. He saw Mr. Harvey, and spoke to him on the subject, and Mr. Harvey, at his suggestion, decided to ask a deputation of practical men to meet Professor Simonds and Dr. Letheby at Crown Point, and to take the opinion of the practical men on the state in which the sheep might be found. That deputation was composed of seven practical men, and they met at Crown Point; but, as he had said at a meeting held a short time ago, very much to their surprise, instead of simply meeting Professor Simonds and Dr. Letheby, they found that they were to meet no less than seven professional gentlemen. Not that the practical men were in any way alarmed, because they felt, and strongly felt, confidence in being able to discuss those points that might come under their observation. He might say, to the credit of Mr. Harvey, that he did everything that lay in his power to give them all a fair and open field, and Mr. Harvey told him privately that he wished neither himself, nor his people, nor his management to be spared in any remarks it might be necessary to make, and as they would see from the remarks he (Mr. Woods) had made at Norwich, he had acted upon this permission. Mr. Harvey provided for them at Crown Point a very sumptuous luncheon, and while the professional gentlemen and the agricultural deputation were partaking of it he would ask the meeting to take a walk with him across Mr. Harvey's fields, and take a practical view of the state in which he found the lambs, and he would state the opinions enforced upon his mind by what he saw. He must confess that he was very much struck when he found that 2,000 sheep had been living together, folded together, and treated as one flock. If the management of practical men in this district, and he might say in every part of the county, was worth anything, the system adopted at Crown Point must have been wrong. There was a great quantity of coarse grass, such as he felt sure no practical man would think of feeding lambs upon, and he found also that a great many of the fields, which were divided by iron fences, where the animals lay, were covered with excrement, which he

had no doubt had lain there for a long time, and which, doubtless, created a very disagreeable effluvia that must have been perceptible to the organs of the lambs. There was another point with which he was particularly struck, and that was, that there was a long road divided from the fields by a wire fence, and that road appeared as if it was a receptacle for the lambs, which were probably taken there every day to be trimmed or otherwise treated, and if there happened to be a shower of rain, he felt certain that that road must have been nothing more nor less than a complete cesspool of excrement mixed with rain. He found, too, that those animals, during the early part of the summer, had been fed in the park where they were then feeding, and it must necessarily be imagined that the fields in which so large a number of lambs had lain were considerably soiled with their excrement. After the rains of August, Mr. Harvey said there was a great flush of vegetation—the grasses that had been dormant during the whole of the summer sprang up and produced a large amount of succulent food. He thought he need not ask any practical man in that room his experience as to the effect that succulent grasses from fields that had previously been heavily fed with sheep must have produced on lambs, for many of them had seen it, and they all knew that it must be highly injurious. It should also be understood that those animals had no artificial food given to them—they had nothing but what the park produced, and that, as he said, was of a very succulent character. There was no change of pasture, and no change of food. He thought, consequently, that those he was addressing would say, that even in what he had already stated there was quite sufficient to produce a disease similar to what many of them had seen in their flocks before. But there had come to his knowledge one important fact connected with the flock at Crown Point which had never yet appeared before the public, and having heard it incidentally it was only by considerable care that he was able to arrive at its truth. He must say to the honour of Mr. Harvey, that when the matter was put fairly to him he honestly told him that which he would relate to the meeting. They all knew that when lambs had been living on dry and bare pastures, when probably some feverish state of the system was produced, the very last thing thing they would think of doing would be to allow them an unlimited supply of water. Their experience told them that their great aim and object when their lambs in hot weather had been kept long without water was not to let them run to it indiscriminately, if they let them have it at all. But he had ascertained that during the hot month of August, and about a week or two before the disease broke out, Mr. Harvey's lambs broke away from the shepherd more than once or twice, and got down to the Thorpe river, where they not only drank the water, but rushed in, many of them going overhead, and a great many over their backs; the consequence being that they not only suffered from the effects of drinking the water, but also from the chill that must necessarily have been produced to the system by their immersion. But let the meeting listen to the account of the kind of water they had to drink. No doubt many of them had seen a leading article in the *Norwich Mercury* of last week, in which the editor said the fish had ceased to exist near Norwich, principally owing to the refuse of the alkali and other works, which rendered the water not only obnoxious but poisonous. As he (Mr. Woods) wished to state nothing but facts which he should be able to substantiate, he had taken very great care to obtain on every point he should speak upon evidence which he defied any one to contradict. He therefore wrote to a friend of his, whom, for obvious reasons, he should not name, though he would hand the name to the Chairman, and asked him the state of the river where the lambs had gone to drink. The answer he received was as follows:—

6th November, 1865.

My Dear Sir,—In reply to your letter I must tell you that the river near Crown Point is, in the summer months, very foul, and the stench sometimes is very bad for a mile lower

down the river. The surface of the water is sometimes covered with a thin coating of the refuse thrown into this river, which I have seen skimmed off to prevent the stench. There is no doubt but that the river water is bad enough to kill fish a very short distance from Crown Point, and must be injurious to sheep if they drink the water. It smells badly two miles past Crown Point. I have smelt it this summer quite to the Wood's End, which must be three miles down the stream. I believe this has been stated in the papers, and can be vouched to by any one living near the river in summer time.

He had also received from Mr. Harvey that morning a letter, from which the following was an extract:—

In reply to your note, it is very possible my lambs drank the river water, which has the sewage of Norwich emptied into it, as they were frequently by the river side, and it is true the river is sometimes so offensive it is difficult to be there without being sick.

He would ask those whom he was addressing whether as practical men they would think it right and judicious, whether they did not think it would produce consequences of which they would be very much afraid if they were to allow their flocks to drink such water as that? But it did not stop there, for he had ascertained as a fact that during three months the lambs frequently broke away to a small pond near Crown Point, which was nothing more nor less than a complete mass of animalcules, and whether this could be beneficial to lambs or not, his own experience was not sufficient to say, further than that he thought it must have been decidedly wrong to have let the lambs have that water. He now came to another point to which he must call attention. They would have read that at the meeting of Saturday week Mr. Forrester admitted that the treatment of the lambs was decidedly wrong, and such as no practical man would think of following without expecting that it would produce something like 15 or 20 per cent. of deaths under ordinary circumstances; but when he found the percentage came to 50 or 60 he held that there must have been something more than common, and that to all intents and purposes it must have been cattle plague, because so great a number of the lambs had died. Now, he joined issue with Mr. Forrester on this. He contended that the greater the number of sheep there were together the greater the loss they were liable to. To meet this point of Mr. Forrester's he would ask them to allow him to tell them that Mr. Palmer, of Foulmere, lost 55 lambs out of 107. Now, what he would ask was this: If Mr. Palmer had had 2,000 sheep in one lot instead of 107, what would have been the proportion he would have lost, the sheep having all the advantages of change and everything that could be given to them? But he had a still more startling point to bring to the consideration of the meeting in connexion with this part of the matter. His friend Mr. Palmer said he knew that a relative of his had unfortunately sustained considerable loss among his lambs, and Mr. Palmer kindly undertook to write for all the particulars, which he (Mr. Woods) had since received. The gentleman who wrote the letter he was about to read was a most excellent manager of lambs, and when they considered the loss, which was very great, with all his good management, he (Mr. Woods) had a right to ask what would have been the loss if that gentleman had had 2,000 sheep lying where only nine score lay on his farm? The letter was as follows:—

Weybread, 2nd November, 1865.

Dear Sir,—In answer to your letter respecting the disease, I can give you no satisfactory explanation. They were from a lot of nine score blackfaced ewe flock lambs, good ones, costing 3s. each. When they first came home they fell down with foot disease, and got very poor. After the first rains in harvest they began to die. The first symptoms were dullness and scouring, and in about ten days they died. Their lungs and livers were entirely gone, but not in the way of rot. I lost 81, and 19 more dwindled away to skin price, thus making 100. The remaining four ewes are gradually getting better. The veterinarians and various persons who saw them thought the disease came from mildew and unhealthy state of the grass and layers. My opinion is that we cannot give lambs too much dry food or keep them too well. We have now several lots doing badly near here, but they are unhealthy ones. The strong lambs are doing well.

I am, dear sir, yours sincerely,

L. O. JEFFES.

To Mr. Thos. Palmer. They found that Mr. Jeffes with all his good management lost 100 lambs out of 180, it showed that the loss at Crown Point was not so startling as to make it necessarily caused by cattle plague. Another point to which he wished to call attention was this. They knew that Mr. Forrester stated—and he

was quite sure that Mr. Forrester stated it believing it to be true, because he believed Mr. Forrester incapable of saying anything but what he believed—that the sheep began to die soon after the bullocks. Now, he (Mr. Woods) had it on the strongest possible evidence, and that was from Mr. Harvey himself, in his own handwriting, that eleven lambs sickened and died before a single bullock was taken ill. He would give them another case. There was a flock in Monmouthshire—in fact there were eight flocks in Monmouthshire, of which he would presently give particulars—in which a gentleman lost 50 lambs out of 130. Therefore they saw that the losing of 60 per cent. at Mr. Harvey's was not so very startling as Mr. Forrester seemed to think. There was another point to which he wished to call attention, and that was as to the time during the past summer when the disease broke out among the sheep in various parts of the country; and he wished them to give particular attention to this, because he thought they would find that the disease broke out in Norfolk and other counties almost simultaneously, the outbreaks being within a week or so of each other. From particulars furnished by Mr. W. Nelmes, of Penbridge Castle, Monmouthshire, he found that the disease broke out in two flocks in Monmouthshire at the latter end of July and in the first week of August, and there were four other flocks in the same county where the disease appeared among the sheep, and at that time there had not been a single case of cattle plague either in that county or the adjoining county. In three flocks the disease commenced at the end of August, and in another it broke out during the first week in September. The disease commenced among the flock of Mr. Palmer, of Foulmere, in August; among the sheep of Mr. Ling, of Shelford-hall, Essex, in the first week of September; among those of Mr. Pitts, of Starston, on the 3rd September; among the sheep of Mr. Robinson, of Oakley-hall, Bishop Stortford, on the 1st September; among the sheep of Mr. Palmer, of Tottington, on the 3rd September; and among the sheep of Mr. Carne, of Bushy-grove, near Watford, on the 5th September. Therefore they would see that the disease in the flocks he had named, and doubtless in others, broke out pretty nearly within ten days of each other. He would now ask them to listen attentively while he read a description of the appearance of the disease among the Crown Point sheep, as stated by Dr. Lethely in his letter to the *Times* of the 27th September. He wished attention to be paid to this because he should read other people's descriptions of the symptoms among their lambs, and ask them whether they did not see a strong similarity. Dr. Lethely said:—

The symptoms which I observed during my visit to-day were the following:—The animal appears at first to be somewhat feeble in its gait; it also looks heavy, and stands with drooping head and ears. Its appetite fails, and it shows signs of severe febrile action by the heat of the head and ears, and by its seeking the shade and running to the water to drink. At this time a discharge begins to flow from the eyes and nose—the discharge being very limpid and colourless like water, not purulent, although there are occasional patches of ulceration about the nose from the irritation of flies. There is some difficulty of breathing, and the respiration is panting, and the animal moans as if in pain. Diarrhoea also occurs, but the discharge is never tinged with blood, as in the case of cattle, but is of a thin gruel-like consistence, and is of a pale greenish-yellow colour.

The next description of the symptoms he should read was that given by Mr. Pitts, of Starston:—

Dulness and drooping, loss of appetite, appearance of pain, coughing, sinking of flesh, discharge from the eyes and nose, and thin flux.

Mr. Robinson, of Oakley-hall, near Bishop Stortford, described the symptoms thus:—

Deadness of coat, loss of appetite, hanging down the head and ears, extreme weakness, excessive thirst, and scouring.

Mr. Nelmes described the symptoms among the eight flocks in Monmouthshire as follows:—

Refusal of food, drooping ears, dull appearance, violent discharge from the nose, shortness of breath, rapid sinking of flesh, scouring, and appearance of pain; coughing, the more violent when disturbed.

In a letter he had received from Mr. Nelmes, that gentleman described the *post mortem* appearances of the lambs. The letter was as follows:—

Penbridge Castle, Nov. 3rd, 1865.

Sir,—I have very great pleasure in replying to yours of the 31st inst. The greatest number of lambs that have died in our flock is 53 out of a flock of 143. Feeding an unusual inte-

rest in this disease, I have been present when several that have died have been opened in different flocks, and I may say in each case there has been congestion of the lungs, also a parting of the coats of the stomach in patches, and sometimes there are spots. I was one day speaking to a professional about these spots. He says it is not unusual to find them where there is congestion of the lungs.—I am sir, yours truly,
Mr. Woods.

Wm. NELMES.

Mr. Garne, the very highly intelligent agent of Mr. Marchbanks, of Bushy Grove, near Watford, in Hertfordshire, described the symptoms as follows:—

The ears drawn back and head down; if moved, begins coughing, and shows weakness of loins by staggering gait; refuses food, sets up its back, and shows appearance of pain, scours a thin greenish-yellow coloured excrement. In some there is no scouring, and these generally prove the worst cases, and die quicker after being taken. When dead the lungs are congested, the liver decayed, and intestines inflamed. The disease may be discovered by examining the eyes of the affected lambs, which are somewhat similar to those of sheep with flukes in the liver.

Another description came from a man who was well known to those present by repute—he referred to Mr. Lugar, of Hengrave, who said, under date Nov. 7th:—

I will now answer your letter of yesterday. My lambs were taken ill, or rather showed symptoms in the beginning of September. The first was a cough, or hussing, which ended in violent coughing. They then had discharge, which sometimes lasted two days, and then ceased, and then returned a second time. The lambs wasted every day, and looked very thin. Those that died did not scour—also wasted very much. I believe it to be the same kind of disease that we have had at times for several years, and many thousands have died from its effects.

He had received several other descriptions of a similar character. He wished the meeting to refer to the county papers of last Saturday week for the description given thirty years by Mr. Youatt of the symptoms shown by lambs with inflammation of the lungs, and they would find that it corresponded in almost every particular with the description given by Dr. Letheby, as noticed in Mr. Harvey's sheep, and, with some little difference—allowing for each gentleman's powers of description—with the symptoms shown by each of the flocks of sheep to which he had just referred. This testimony showed clearly enough that the disease of which he was speaking had been a recognised disease thirty years ago, the symptoms then being the same as now. They should understand that all these returns he had received before he went to Crown Point, as he wished to be perfectly prepared with evidence to meet the scientific gentlemen. There was another point on which he had been twitted more than once at the Norwich meetings, and that was as to whether or not the disease was a curable one. He would say advisedly that the disease at Crown Point was a curable disease if taken in time, and he would corroborate this by practical facts. He would ask the question of Mr. Palmer (of Foulmere), Mr. Palmer (of Tottington), Mr. Pitts (of Starston), Mr. Garne (of Bushy Grove, Watford), and Mr. Lugar (of Hengrave), and they would say that they had cured lambs with precisely the same symptoms as those at Crown Point. He would now return to the learned professors and agricultural gentlemen whom he had left at luncheon with Mr. Harvey, and proceed with them to the *post mortem* examination of the dead lambs, a considerable number of which lay about. Several of the professional gentlemen—he did not say with what object, that was best known to themselves—selected those cases which they considered the worst. Perhaps they were right, as they wanted, no doubt, to give clear and undeniable evidence of what they expected to find. It was much to the credit of Mr. Smith, the veterinary inspector of Norwich, whose conduct throughout had been uniformly straightforward and honest, and that of a man who had an opinion of his own, and was determined to maintain it, that he had stated when the dead lambs were about to be opened, if the lungs were healthy he should say it was cattle plague; but if, on the contrary, they were congested he should have very considerable doubt whether it was cattle plague or not. This opinion was borne out by a great authority, Dr. Smart, who, in his report to the Council of Edinburgh, the other day, made the following remark:—

The "staring hide" and "arched back," so frequently mentioned as distinctive features of this disease, while characteristic of the advanced form of pleuro-pneumonia, are not at all marks of the "rinderpest." There is no cough or

lung symptom in the pure and uncomplicated examples of the disease.

Consequently, with so great an authority behind him, Mr. Smith was not so far wrong as some professional gentlemen were willing to make it appear. He wished to call particular attention to the fact that in pure cases of *rinderpest* the lungs were as healthy as they could be. But even if they found a few cases where the lungs were diseased, was this at all surprising, when they considered that there was still a great amount of lung disease in this country? but, singularly enough, he had never yet met with a gentleman who, on *post mortem* examination of bullocks that had died from the *rinderpest*, had found any lung disease at all. Mr. Brasnett, of Croxton, had seven bullocks taken ill the other day, and they were slaughtered, and the veterinary inspector said the lungs were healthy and the stomach was not spotted. Now, with respect to the *post mortem* appearances in the lambs at Crown Point, there was nothing particularly remarkable in the first two or three cases. There was great inflammation of the viscera, extreme congestion of the lungs, and the livers were diseased. As to the lungs, they were what in medical phascology were termed hepatized, which meant that they would readily sink in water. It should be understood that there were two or three cute shepherds there, and they had, on their own account, opened one or two lambs, and there saw distinct spots, which the learned professors afterwards made so great a matter of; but they only saw what they were prepared to swear they had seen in sheep many years ago. During the *post mortem* examination, the very intelligent shepherd of Mr. Rising, at his (Mr. Woods') suggestion, went and dug a lamb up from a pit, and he (Mr. Woods) called the attention of the professors and the medical gentlemen to the state of the stomach. When they examined the lining of the fourth stomach they found it spotted. This settled it in the minds of those gentlemen as being conclusive that the sheep had died of cattle plague. The practical gentlemen were inclined to have produced evidence, and to discuss, not only the question of the *post mortem* appearances, but as to what was the general condition of the sheep; but from some cause or other, best known to the other gentlemen, they declined, and thus ended the meeting at Crown Point. The great point that was made as to any significant and marked proof of the lambs having had the *rinderpest* was, so far as he could see, that they had those spots on the fourth stomach. There was not one lamb examined after death at Crown Point but its lungs were more congested than he had ever previously noticed to be the case either in sheep or other animals, and the lungs of the animal that had the spotted stomach were more congested than those of either of the other animals. If, therefore, it was a feature that cattle with the *rinderpest* had healthy lungs, assuming that the sheep also had *rinderpest*, it was a direct reverse of that feature to find that they had unhealthy lungs. They had been told lately that the lungs of hogs were more susceptible of disease than those of beasts. But was this the fact? He asked those whom he addressed, as practical men, to say whether they had not seen and heard, in their experience, of 25 per cent. more cases of lung disease in cattle than in sheep? It was a strange and startling fact, that in the two days following the meeting at Crown Point, Mr. Rising had a sheep taken with a disease the symptoms of which were similar to those observed at Crown Point. Mr. Smith examined the carcass of that sheep, and found unmistakable evidence of those spots on the stomach; and yet there was no cattle plague on Mr. Rising's farm, nor had any been known to be in the neighbourhood. Consequently, if that sheep had the cattle plague, the cattle plague must be an epidemic, because the disease was not taken by infection or contagion. He would now read what Dr. Letheby said was the immediate cause of the death of Mr. Harvey's sheep:

The immediate cause of death in the sheep is extreme congestion of the lungs, amounting in many cases to hepatization. This is a constant *post mortem* sign in the sheep, and is rarely or never seen in the cattle plague.

On the same Saturday that Mr. Rising had described his sheep to him (Mr. Woods), Mr. Farrer, of Sporie, said he had had a lamb die, and described the symptoms as similar to those at Crown Point. Mr. Farrer said he found the fourth stomach spotted like aplum pudding with the so-called plague spots; and yet there was no cattle plague on Mr. Farrer's farm. Two or three days afterwards he (Mr. Woods) went to Mr. Lindsey's, of

Stanford, and there saw two dead lambs that Mr. Lindsey's shepherd had opened an hour or two before, and in them he saw stronger manifestations of the so-called cattle plague than he had seen at Crown Point—the stomachs being more spotted, and showing altogether stronger symptoms. The shepherd afterwards told him that a day or two later he opened another, the fourth stomach of which was even more spotted and marked than those of the animals he (Mr. Woods) had seen. He also had a sheep sent from Mrs. Howes' farm, at Blakeney, and it was opened in the presence of two medical gentlemen of Watton. In it they found the hepatized lungs and the inflamed viscera, but there was an absence of the spots in the stomach, and he would declare upon his honour that the internal lining of the fourth stomach was precisely in every particular like that of the sheep he had seen opened that had been inoculated by Mr. Wells. There had been no cattle plague near Mrs. Howes' farm. They opened another lamb, belonging to Mr. John Gasken, of Tompion, in the presence of Lord Walsingham, and found some gangrenous matter round the throat, and on the fourth stomach, two clear and distinct spots like cattle plague, and so deep as to have actually eaten into the submucous coat of the fourth stomach. The lungs of the animal were also much congested and the viscera very much inflamed. But the most striking case he had to call attention to was one from Mr. Bäck's, of Saham. The lamb was sent to Mr. Worms' veterinary establishment last Wednesday, and Mr. Worms had invited him to go and look at it. He went, and found that it had evidently been shrinking, and there were the drooping ears, arched back, moving flanks, appearance of great pain, and discharge from the nose. He (Mr. Woods) said it would die, and it died on the following day. Mr. Worms sent him word that if he liked to call on Thursday afternoon he could see the sheep opened. He accordingly attended, and they had a *post mortem* examination, and that sheep had points of disease more strongly developed than any sheep he had seen at Crown Point, more than ever confirming his opinion that there was no cattle plague in sheep. The sheep was opened shortly after death, and the appearances were these: Great inflammation round the root of the tongue, the larynx much inflamed, and also the windpipe. The internal lining of the gullet was very much ulcerated with deep-seated ulcers, some so deep as to penetrate through the lining of the gullet, and these extended, more or less, down to the rumen, or paunch. The parts not ulcerated were of a gangrenous purple colour. The heart was much inflamed and blocked up with coagula. There was great inflammation of the viscera; effusion of blood into the cellular tissue of the sub-mucous coat of the fourth stomach, forming livid patches, which in medical language was called ecchymoses, which he had never seen in any sheep of Mr. Harvey's; and a clear and distinct livid patch in the duodenum, or first intestine. This brought him down to the examination of the points connected with another flock of sheep that had been mentioned in the reports—those of Mr. Temple at Blakeney. He had not seen the sheep, but he had taken pains to make inquiry about them, and had been informed that they were bought at Colchester by Mr. Page and sent to Thetford fair, but he had not learnt whether they were sent by rail or driven, though he was led to believe they were driven, more or less. Thetford fair was in the middle of August. The sheep were sold to Mr. Stannard, who sold them to Mr. Patterson, and Mr. Patterson sent them to Mr. Temple. If those animals had been drifted some distance before they got to Thetford fair, and they stood that fair on a hot, dry day in the middle of August (Thetford, in dry weather, being a very dusty place), and if they were then sent off by rail, without any refreshment or water, to Fakenham, and then driven from Fakenham down to Blakeney, he would ask any practical man whether there were not fair and reasonable grounds for supposing that those sheep might have suffered to some extent from the drifting and the great exertions they had consequently to undergo? He knew that Mr. John Matthews, of Stanford, had seen those sheep, and he consequently wrote to Mr. Matthews, asking him what was his opinion of them, taking a farmer's view, and Mr. Matthews replied as follows:

Stanford, 4th October, 1865.

DEAR SIR,—In reply to your letter to-day, I beg to say I saw Mr. Temple's lambs on Monday, the 17th September. My opinion then was, and I have seen nothing to alter it since, that the symptoms they exhibited were precisely like those exhibited by lambs in my own neighbourhood, with

this exception—that they were aggravated by drift and exposure to sun and dust for several days, with insufficient food. In answer to your second question, whether the symptoms materially differ from cases I have seen other years, I beg to say (with the exception named) that the symptoms were those of 60 lambs I lost from a lot of 240 ten years since. I have seen since, at different periods, lambs similarly afflicted, and the loss probably would have been as heavy had they not been favoured with seasonable weather.

I remain yours very obediently,

H. Woods, Esq., Merton.

JNO. MATTHEWS.

How frequently did people become alarmed at the name of the cattle plague! It was becoming popular to call every disease that happened to animals the cattle plague, and much alarm was often felt about it. He had that morning received a letter from Mr. Lugar, in which that gentleman mentioned a case worthy of attention. The letter was dated November 7th, and he would read the following extract from it:

I wish to mention a case which has just occurred at Lackford, about three miles from Hengrave. The proprietor, who farms some of his own estate, sent his man up to ask me what was to be done, for his *breeding ewes* were dying fast—they had lost eleven, and several others were ill. This came on so suddenly they could not think what it could be, for they were dead in a few hours. I sent the cattle inspector over, who ordered three to be killed, and said it was the nearest in appearance to the plague of anything he had seen. The sheep appeared blown and in great pain; and, when opened, the intestines, &c., were one mass of inflammation. However, I advised them to make a complete change in their food. The last account is they are better, and no more dead—in truth it was from putting them on to very young grass on low meadows, and then on to *Swedish turnips* very full of growth, and having too many to begin with, for it appears that it is not the plague, and change of diet has worked a cure.

Now, if the owner of those sheep had not met with so sensible a man as Mr. Lugar, it would have been said, "a case of cattle plague has occurred at Lackford among old sheep," and the practical men would have been swamped by the remark that the disease had hitherto been confined to lambs, but was now shown to have attacked old sheep. He had that morning received from Professor Gamgee a letter, in which he said:—

Lambs have died in large quantities this year of parasitic lung disease, and near Rotherham (in Yorkshire) it was supposed that the cattle plague had attacked the lambs, and I found on examination that such was not the case.

This brought him to the trials at Crown Point. After the *post mortem* examinations, some objections being taken by practical men to the conclusions arrived at by the medical gentlemen, it was determined that there should be a trial of sheep at Crown Point, and he believed it was decided at a meeting of the Cattle Plague Association that there should be forty sheep taken from what were considered the best of Mr. Harvey's lot, though he was sure he should be borne out in saying that when the sheep's eyes were turned so that the whites of them could be seen, they bore all the appearance that was described in Mr. Garne's letter. When they wanted out of that lot to find a healthy lamb to make an experiment upon for the satisfaction of the professors, they confessed they could not find one. This showed that the whole of them were more or less in an unhealthy state. Twenty were to be taken from animals said to be convalescent; twenty-two were to be taken which were nearly dead, and twenty more to be bought, and if he was right they were to be good, strong, healthy, well-fed lambs, and there were to be ten of Mr. Read's shearlings. The selection of the convalescent lambs led to some dispute between Mr. Rising and Mr. Wells. The twenty from Sir Thos. Beauchamp's flock that were to have been good, strong, healthy lambs, were light, delicate animals, and two of them he would swear were not healthy. Mr. Harvey's and Mr. Rising's shepherds reported that when they took the twenty off the wagon they said they were a poor lot to begin with, and one that lagged behind as they were taking the lot to the field of trial, they observed not to be healthy. Now, without desiring to cast any reflection on any individual, he must say that where there was a shadow of doubt the doubt ought to have been removed—and the instructions of the committee of the Cattle Plague Association ought to have been literally carried out. Therefore, those twenty lambs ought to have been strong, healthy animals.

A VOICE: What was the cost of those lambs?

Mr. Woods said they ought not to have cost much by the look of them. This brought him to another point to which

he must call attention. They had all seen a letter of Mr. Wells in the Norwich papers of last Saturday, and Mr. Wells evidently felt aggrieved at some remarks he (Mr. Woods) made on the previous Saturday at the meeting of the Cattle Plague Association. He was willing to admit that he made those remarks in the heat of the moment upon some information he had received which he was willing to believe was misrepresented, and consequently if Mr. Wells felt that he had said one word that was painful or offensive to him, or language that one honest man ought not to use towards another, he had great pleasure in withdrawing such remarks. He could not charge Mr. Wells with anything like unfair conduct, because in a letter he had received that day from a gentleman in whose opinion he had considerable confidence the writer said he believed Mr. Wells had treated the whole matter fairly. But while admitting this and believing that Mr. Wells did not wish to misrepresent facts, he was sure Mr. Wells would allow him to say that he (Mr. Wells) was liable, like other persons, to make mistakes. Mr. Wells said in his letter that the sheep on trial did not succeed so well as was expected under the management of Messrs. Woods and Rising. If the Woods there alluded to was himself he would tell Mr. Wells that he had had no more to do with the selection of those sheep nor with the management of them than the King of Abyssinia. Had they been under his treatment they would not have been treated as they had been. In placing those sheep with others on trial it ought to have been the first object to prevent them dying from any other complaint than that which they were placed there to take, if they could take it. He did not mean the slightest reflection on Mr. Rising, who had done everything a man could do, and he must say that if Mr. Rising had erred at all, it had been in endeavouring to so carry out his management that the sheep should have the plague, if they could get it, Mr. Rising having felt as strongly as he (Mr. Woods) had done that they would not take it. Mr. Rising therefore honestly and fairly desired not to leave a single point with which those who were opposed to him could find fault. Let them now see what the treatment of these sheep had been? Mr. Harvey's sheep were taken from grass land, they had been running on a wide space; and Sir Thomas Beauchamp's sheep—and he had this from Sir Thomas Beauchamp's agent—had been running in his park, and on new layers. Those sheep were placed in a small fold upon black land, and young growing turnips were given them to eat. They were not allowed to run out as flockmasters were in the habit of letting their sheep do when the lambs were put on turnips. He believed all flockmasters trained the lambs to eat turnips for three weeks or a month before they regularly put them on that food, for fear they would be killed outright if put on turnips all at once. Then, the turnips given to the sheep were such that he was quite sure they would kill any lot of sheep. He would read a letter he had received from Mr. Rising yesterday morning, in which Mr. Rising sent him a statement of the trials:—

Cossey Lodge, Norwich, Nov. 6th, 1865.

DEAR SIR,—I beg to forward you a statement of the trial of the sheep at Crown Point, which commenced on the 10th of October last. I selected forty lambs off the Park. Mr. Wells selected forty of the very worst that could be found, twenty were brought from Sir Thos. Beauchamp's, and five shearlings from Mr. Read's—the whole of these were put in rather close fold, as the main object in the trial was to prove if the disease could be conveyed to the healthy animals. I must tell you we started unfairly, as there were no troughs for the first five days; this, of course, was against such weakly sheep, and I had to feed them on miserably small turnips, full of growth (the worst thing you can give to sheep); but in spite of all this, I think the trial has been a successful one, as the following account will show. We have now living (with the exception of one likely to die, and I expect will live), 75 per cent. of the forty selected by me; over 50 per cent of Mr. Wells' lot, 85 per cent. of Sir T. Beauchamp's, and all the shearlings, notwithstanding Mr. Overman stating that one of them had the disease, but that my medicine cured it (so much for Rising's patent). I ought to state that six died the first night (of course they were dying when selected). The numbers as they died were as follow: First week, twenty-two; second week, six; third week, three; fourth week, two; and, with the exception of the one before mentioned, all the others are likely to live and are doing remarkably well. Trusting I have sent a clear account,

I am, dear sir, yours truly,

ROBT. C. RISING.

Henry Woods, Esq.

Mr. Harvey also expressed his view as to the way the sheep

were treated. In a letter dated the 7th November, he said:—

The sheep are now doing well: some days I do not lose one, and others I do, according to the change of temperature, I think the fault in Mr. Rising's management was that he began before he had his materials together, troughs and proper food, and no doubt at first was the principal loss. Again he imprisoned in a small pen lambs which never saw a turnip before, which prevented many eating the food provided until actual hunger and consequent debility had ensued, while the very ill died without making the exertion.

Consequently the meeting must feel, as practical men, that the trial was not only a trial whether the animals would take the disease, but a strong trial as to whether or not they would live under such treatment. The result which he had received up to that morning was as follows: From Mr. Harvey's best lot of forty, twelve had died; from the twenty said to be convalescent, seven had died; from twenty-two nearly dead, thirteen had died; from the twenty of Sir Thos. Beauchamp's, three had died; and the ten shearlings of Mr. Read's were all well. The two last named lots had been with the affected animals since the 10th of October, and only three of Sir Thos. Beauchamp's had died; while the whole of Mr. Read's shearlings—the five that were put in the field with the infected animals, and the five that were put in the park with the infected animals—were all living and doing well. When he went to Crown Point to look at the lambs that day fortnight, he found that one of Sir Thos. Beauchamp's had died, and therefore he felt it important to make a superficial examination of the state of the animal. He found that it only weighed 4 stone 3 lbs. as it lay; it had not an atom of flesh on its bones; and its wool came off with the slightest pull, and any practical man knew that if the animal had been anything like healthy for weeks before, its wool would not have come off so easily. He went to Norwich, and learning that there was to be a committee of medical gentlemen to meet Mr. Wells and Mr. Smith and make a *post-mortem* examination of that animal and of the animal that was said to have died from inoculation, he felt it his duty to be present and see what took place. He was present, and he would say that the *post-mortem* appearances of Sir T. Beauchamp's lamb were these: It had consolidated lungs, terrible inflammation of the viscera, great emaciation of form, and there were clear and evident specks of what were called the cattle plague; but when they came to look into it it was admitted by the medical gentlemen on all hands that it was a diseased animal when it went to Crown Point, and had not died of cattle plague. Let them look, then, at the sequel. If the sheep did not die from cattle plague, what could the medical gentlemen say about the spots with which the fourth stomach was covered, and which were like the spots found in the animals they said had died of cattle plague, at Crown Point? With regard to the sheep that had been inoculated, the *post-mortem* appearances were similar in some respects to those of the other animal, except that there was an absence of any spot on the fourth stomach. The mucous lining of the stomach was certainly thicker, but there were no spots; and when he called attention to the surface of the skin of the animal, which showed no manifestation of having taken the plague, one gentleman turned round—he would not mention the name, because it appeared to be dangerous to give names—and said “Then it must have been taken by contagion.” They had been asked there to see the inoculated sheep opened; but had it died from inoculation? He had no hesitation in saying it had not. He now came to the report sent in by the medical gentlemen to the Cattle Plague Association, and he wished to speak with the most marked respect of those gentlemen, who he believed went to Crown Point and did everything they could to arrive at a right and proper conclusion; but it was no disrespect to them to say that a man unaccustomed to the *post-mortem* examination of sheep could form but a very inadequate opinion of the appearances presented. He saw a *post-mortem* examination of a sheep made in the presence of a surgeon of great skill, whose impression was that the lungs were healthy, while the impression of practical men was that they were not healthy, and when the lungs of a healthy sheep were exhibited the medical gentleman acknowledged that he was in error. Was it not possible then that the gentlemen who had sent in the report he was about to read might also make mistakes; was it possible that without great practical experience they could distinguish between animals that were healthy and animals that were slightly affected? Their report was as follows:—

To the Chairman of the Norfolk Cattle Plague Association.

SIR,—Your committee, in carrying out the instructions given to them, have made experiments as time and opportunities have allowed. Some of these experiments are concluded, others are still in progress; but, so far as they have gone, your committee are able to report—1st, that the disease is communicable by inoculation from bullock to bullock; and 2nd, that the disease is communicable from bullocks to sheep by association. We are, sir, your obedient servants,

W. P. NICHOLLS, PETER EADE, M.D.,
WM. CADGE, THOS. WELLS, M.R.C.V.S.,
FRED. BATEMAN, M.D., WM. SMITH, M.R.C.V.S.
Norwich, Nov. 1, 1865.

Of course no one doubted that the disease was communicable from bullock to bullock by inoculation; but the question was as to its being communicable from bullocks to sheep by inoculation. Where was the report of the medical gentlemen on the inoculated sheep? It was not noticed in the report, which was the first those gentlemen had given to the public. Had they ignored the inoculation altogether, or was it in progress? This was a question which practical men wished to have answered. Mr. Forrester, in reading that report, had said the facts in it were few but weighty; but what proof did they give of the assertion that sheep had died from association with bullocks? Mr. Forrester had said that Mr. George's ewe that had died was a four-year-old, and that it had caught the disease from being associated with Mr. George's bullocks; but in a letter to him (Mr. Woods) Mr. Smith stated that the ewe was five years old. He should like to have looked into her mouth, because when they got to four or five years old the marks were so indefinite that it was difficult to say whether an ewe was four or five, or even eight years old. What age, then, was the ewe? What was her condition when put with the bullocks, and did she not die from inflammation of the lungs, caught through the late rains? He would give an instance. About the same time that animal died, a ram that took the first prize and the cup at the Norfolk Agricultural Show, and the third prize at the show of the Royal Society, was taken with as strong an attack of inflammation as he ever saw; he was four days between life and death, and everybody felt sure he would die, but by the strong and active measures taken with him he was now alive and doing well. It was natural that on the *post mortem* examination of the ewe he had mentioned the congestion of the lungs was not so strongly marked as in the case of the lambs. Mr. Forrester went on to tell them in his speech that one very strong lamb of the trial lot at Crown Point jumped the hurdles and helped himself to the turnips. If he did so, the fact of his eating those strong turnips on the black land was sufficient to account for his death—such turnip tops as he saw in the field were sufficient to kill any lamb. He would now give them some very strong and positive evidence in direct contradiction to what the medical committee had set forth. Professor McCall, in a report to the Town Council of Glasgow, after speaking of the diseased cattle, said—

I have also had five ordinary sheep—viz., two ewes and three lambs—and one African ewe sheep, in constant contact with cattle suffering under plague in its most severe form. They have been confined in the same boxes and eaten of the same food since Thursday, the 28th ult., and I also inoculated with the discharge from the eyes and nostrils of plague-stricken animals the African ewe and one of the lambs in the beginning of the week. None of them have shown any symptoms of disease. I have also kept five dogs—viz., a Scotch terrier, two retrievers, a pointer, and a mongrel—at the sanitarium, and fed them almost entirely on the stomachs and intestines of cattle which have died from plague, selecting those portions which are most virulently affected. They have continued feeding on this since Monday, the 18th, and no symptoms of disease of any kind have shown themselves.

That morning he had received the following letter from Mr. Nelmcs:—

Pembridge Castle, Nov. 3rd, 1865.

SIR,—Since I wrote my first letter of to-day I have seen a veterinary surgeon; he is a person who has a considerable sheep practice, and has paid very great attention to the lamb disease for years; he says he has had as many as 3,000 at one time under his care, and the only difference this year to others is, he has found the disease of a more stubborn nature. He has been to Edinburgh (of which college he is a member), where he stayed a week, during which time he was fully employed investigating the disease—namely, the cattle plague, and dissecting animals that had died from the plague; he examined the sheep that have been in the sanitarium for weeks, living with diseased beasts and feeding with them, even eating the hay with the *saliva* of these beasts upon it, and he pronounced them healthy. I asked him his opinion, it he

thought this lamb disease partook in any way of the cattle plague; his reply was, not in the least. It was the same disease that has been so prevalent in this part of the country for years, but more severe in its nature this year than he ever found it before. He had the accounts of the Norfolk flock, and he says he is satisfied that it is the same disease that has been raging in this quarter, and quite laughs at the idea of the professors; but as he did not wish me in any way to make use of his name because he is also a member of the R.V.C., I therefore promised him it should not appear. I think he will give me his assistance if you should require any further information. I am, sir, yours truly,

Mr. Woods.

WM. NELMES.

They thus had evidence that in Glasgow, where the sheep had been placed with infected cattle, and had been inoculated, they did not take the disease; and in the Edinburgh sanitarium sheep placed with infected cattle had also resisted the disease, as was confirmed by a member of that college. He would now read another letter he had received that morning from Mr. Garne, and though it took rather a different line it was well worthy of attention. It was as follows:—

Bushy Grove Farm, Watford.

Dear Sir,—I beg to inform you that from the birth of Mr. Marjoribank's lambs to the time of their being attacked they had been particularly healthy, having lost only one per cent. Just previous to their being attacked we had very heavy fogs (during the evening, the pastures being covered with what is commonly called cobweb, and the air being as it were full of it. In a few days the grass fields were covered with a peculiar kind of blight, which collected on the shoes similar to a fine powder of a pale chocolate colour; the clovers were covered with mildew. I remarked to the shepherd how unhealthy the pastures were, remembering having heard my father (who is an experienced stock manager) say that such was very injurious, and often produced lusk in young calves. Soon after this the lambs showed the symptoms I have described to you. I believe the sheep disease has no connexion with the cattle disease, and for the following very good reason:—At the time I had several lambs ill (with what, to all appearance, has been called in Norfolk cattle plague) I put them in a close, and soon after having two cows calve, I turned them into the field with the lambs for a few hours every day, and they (the cows) took no harm.

If a beast could communicate the disease to sheep, it was fair to suppose that the sheep could communicate it to beasts, but here was evidence that they could not do so. He had another letter, which he considered an important one, because it gave facts near home. It was written by Mr. Fulcher, bailiff to Lord Sondes, and was as follows:

We have had several cases of plague in this neighbourhood. In most instances the diseased cattle have been herded with sheep, yet the latter have always escaped. Mr. Daek, of Guist, three miles from this place, who lost ten bullocks of *rinderpest*, informs me that at the time the beasts became diseased they were grazing in the same pasture with his ewes. The present cattle plague is, I believe, admitted to be identical with that which prevailed in the last century; and I look upon it as a remarkable and, to flockmasters of the present day, cheering circumstance, that all the old records of the disease mention it as affecting neat cattle only.

He would now turn to Mr. Harvey, who, they learnt, had 650 sheep left that were doing well, but that was chiefly because Mr. Harvey had an intelligent shepherd, who knew how to treat sheep, and not only gave those sheep change of food, but gave them highly nourishing food. He (Mr. Woods) had heard that Mr. Harvey had been advised to slaughter the whole of his flock, when they were first seized, and when he had something like 1,500 or 1,900 lambs on his farm. He also heard the statement indirectly contradicted, but the statement was so astounding that he never dared make use of it for fear of saying what was not true. He wrote to Mr. Harvey the day before yesterday, and asked him plainly whether such was the fact or not; and Mr. Harvey said, in reply:

7th November, 1865.

It is also true that it was recommended to Capt. Lambart, by a Government veterinary authority, to kill the whole flock (or so he understood it), and that I scouted the idea, and wrote myself to the Privy Council, stating I hoped that it would consider well before adopting such a course, or sanctioning the dictum that the disease was cattle plague without further information, and also stating, if it was really cattle plague, at least half recovered, and that this indiscriminate slaughter was very wrong.

Mr. Harvey's conduct in that matter was beyond all praise. If Mr. Harvey had been seized with the panic attempted to be forced on him, that panic would have taken hold of the

country, and not a flock would have been safe from slaughter, by order of the veterinary inspectors. In Wiltshire, one flock was slaughtered chiefly because the sheep were suffering from a disease like that at Crown Point; but Mr. Harvey, with a nobleness of conduct that did him infinite credit, and for which he deserved the hearty thanks of every flockmaster in England, determined to see it out. On the Saturday following the meeting of the deputation at Crown Point two gentlemen went to Mr. Harvey and offered to buy the whole of his lambs—two men of sound judgment and great experience, who were not likely to make a mistake. This was a fact which showed that those men of experience had a reasonable ground for believing that if they gave those lambs a change of food and a change of locality they would save a large percentage of them. Mr. Harvey told them that if they would give him ten thousand pounds for the remainder of the lambs he would not let them go, and by so doing run the risk of having it said, if risk there were, that he had helped to send the disease to other parts of the country. He now came to the most important part of the information connected with the cattle disease that he had yet heard. Count Nesselrode, a Russian nobleman, and an extensive landed proprietor, was staying at Merton-hall, and had authorised him to state to that meeting that in 1861 he lost the whole of his large herd of cattle from *rinderpest*. He had at that time 10,000 sheep running on the same land with the infected cattle, but not a single sheep was attacked with the disease. Count Nesselrode had entirely given up keeping cattle in consequence of the *rinderpest*, and kept sheep only, for it was found that they did not take the disease, although it had been tried to be made out that there had been cases of *rinderpest*: but it always proved to have arisen from improper feeding and management. If a man of the standing of Count Nesselrode in Russia, and of his great experience, instructed him to say upon his (Count Nesselrode's) authority, that sheep in Russia did not take the disease, he would ask how could they take it in England? He now came to the close of his address. It had been said that he had taken a negative position with respect to the sub-committee of the Cattle Plague Association relative to these sheep trials. This he begged publicly to deny, and he would show why he had not gone in opposition to them. In the first place he was personally acquainted with every gentleman on the sub-committee, and they were all gentlemen for whom he had the most profound regard. He honestly believed that their only object was to do the best they could with the funds at their disposal, and for the interests of the insurers; consequently, why should he wish to oppose them? But, while they claimed for themselves the right of free expression of opinion, they should accord the same privilege to others. If he had taken a strong stand he had done so with a good intent and on public grounds, and he would ask the meeting whether he had not laid before them just and reasonable grounds for the position he had taken? And what should he gain supposing he proved his position to be right? Only the consciousness of having done his duty. If, on the other hand, he was proved to be wrong, what should he lose? But in the latter case, he should do as every honest man would do, and admit that he was mistaken. While saying this he must also say that he felt no hostility to the members of the sub-committee, though he would maintain his unyielding and uncompromising opposition to anything like scientific delusions. Science had done much for agriculture, and might do much more; but it had many mistakes, and one among the number that would take the first rank was the endeavour to persuade the public that the *rinderpest* existed among the sheep at Crown Point.

DEATH OF MR. HUGH WATSON.—This celebrated Scottish agriculturist died at his residence, The Den, near Perth, on the 10th Nov., in his 78th year. For nearly three years he had been confined to his room with a chest complaint, originating in neglected bronchitis; and it was quite a miracle that he should have lived so long. The following sketch of his history is from Mr. Dixon's recently published work, "Field and Fern; or, Scottish Flocks and Herds." "The castle of old Forfar might once, as a poet observes, have been 'stuffed full of Englishmen,' but we had no time to inquire after the fate of our compatriots, as we pointed straight from

Kirriemuir to Mains of Kelly. Keillor, which has always been regarded as the very Warlab of the 'doddies,' lies about twelve miles from it, and a little east of Cupar Angus. It will be four years come Martinmas since Mr. Watson left it, after a residence of four-and-fifty years, and retired to a new home in Perth. He was purely catholic in his cattle tastes. Bracelet, Charity, and one or two more of the pure Booths were the models he kept in his eye, in building up his blacks; and even in a shire so strongly wedded to its own breed, he did not shrink from saying so. Many of his dearest friends lived over the Border—John Booth, Anthony Maynard, Wetherell, Torr, and Philip Skipworth—and he loved to go shorthorn and sheep judging with them to Ireland, and to call to mind Booth's merry jokes and his practicals on old Philip. He had also many 'a quiet day at Wiseton' with the first earl among the shorthorns; and he was walking with his lordship on the race-course at Doncaster, just before Elis's St. Leger, when he first met Sir Charles Knightley. The old baronet began to rally him directly after they had been introduced, in allusion to the earl's politics, on 'not keeping better company.' Before the end of the week they met again at a sheep sale at Wooller, and for many years kept up a strong correspondence. Old Jock (1), Strathmore (5), Angus (45), and Pat (29), were his four favourite bulls, and there is a strain of them in every great black herd. Old Jock was the most stylish of the lot, and showed, as his owner never scrupled to say, 'much of the shorthorn superiority in hair and touch.' His son Pat thought nothing on one occasion of walking eighteen miles to a show, and winning; and his son, Hanton, made the herd fortunes of McCombie, who bought him for 105 gs. when he had won at Berwick. Old Jock was sold for 100 gs., after taking a Highland Society first in 1844. In 1852 his son Grey Breasted Jock, or Second Jock, beat all the polled bulls in a sweepstakes at Perth, when he was thirteen; and Black Jock (3) and Young Jock (4) kept up the line. 'Keillor Watson,' as he is always called, began to show in 1810, and won upwards of two hundred prizes for sheep and 'doddies' in the next thirty-three years, principally at Strathmore (Cupar Angus), the Highland Society, and the Royal Irish. Some of these must be credited to thorough-breds and cart-horses, and among the medals and other trophies there are not a few race-cups. Old breeders still speak with rapture of the heifers which he showed at Perth in '29; and his Leicester rams were so good and level on that occasion, that each of the three judges had got a different one for first. 'Twenty-nine was also the year of his Smithfield heifer; and so delighted was Earl Spencer, the president of the club, with her, that he requested that she should be modelled and struck off on a medal. He also gave the Irish a taste of his quality, and made several large sales there. His four-year-old Angus ox went over, and was placed first for the Purcell Challenge Cup at Belfast, and yet, strange to say, died after all in the plough at the Royal Home Farm when he was rising eighteen. Still his fame was in all lands, as a traveller in India found his portrait pasted up on a temple of Vishnu. His longevity was hereditary from his dam, old Grannie, who gave no milk after she was 28, and ended in July, '59, a pilgrimage of 35½ years. From one to three she was often shown, and very seldom beaten as a cow; and her guardian, James Thompson, after forty-two years of service, received one hundred francs as a tribute from the 'Société Protectrice des Animaux.' She is 'the prima cow' of the polled herd-book, and dates from 1824; while Colonel, the premier bull, is six years her senior. This book, which was published in April, 1862, contains entries from 126 owners, 31 of them Galloway men. Of the 336 numbered bulls, 45 are Galloway, and the cows of the sort muster 95 out of 846. Mr. Watson kept Leicesters on his low land, and southdowns, to which he had always a strong leaning, on the hill. In 1838, he could record that he had bred the latter for five-and-twenty years, that he thought them as hardy as the Cheviot, and that their snug-woolled heads and necks dried sooner after a storm. In another respect he found them very superior, as he could always fatten them much better off grass the year their lamb was taken from them. His experience of their hardihood was drawn from the fine middle range of the Seidlav Hills, where they browsed upon the green sward, intermixed with whin and heather, five hundred to twelve hundred feet above the level of the sea, a spot 'too high for Leicesters, and under the level at which the native black-face only thrives.'"

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of the Council was held at the Railway Hotel, Taunton, on Saturday, the 11th of Nov, under the presidency of the Earl of Portsmouth. There were also present Colonels Acland, M.P., Archer, and Luttrell, Drs. Brent, Gillett, and Scott, Rev. T. Phillpotts, Messrs. G. H. Andrews, R. Bremridge, R. H. Bush, J. H. Cotterell, E. S. Drewe, T. Danger, J. Daw, R. R. M. Daw, T. Duckham, H. Fookes, M. Farrant, J. Fry, Jonathan Gray, J. Gould, J. D. Hancock, J. Hole, T. Hussey, H. P. Jones, R. K. M. King, R. May, G. S. Poole, W. Porter, J. W. Sillifant, J. C. M. Stevens, H. Williams, W. Wippell, and J. Goodwin (Secretary and Editor).

Dr. GILLETT brought up the quarterly report of the Finance Committee, and various sums of money were ordered to be paid in accordance with its recommendations.

THE SALISBURY MEETING was fixed to commence on Monday, June 4th, 1866, and it was directed that all entries of Stock, Poultry, Implements, and Works of Art be made by the 14th of April.

THE STOCK PRIZE SHEET was accepted and confirmed; the Society's prizes amounting to £1,092; those offered by the Salisbury Local Committee to £150; total prizes for Stock £1,242. In the prize sheet Devon, Herefordshire, and shorthorn cattle are all placed on the same footing. In the sheep classes several additions have been made; prizes are now offered for Leicesters, Cotswolds, other Long Wools, South Downs, Hampshire Downs, Shropshires, Oxford Downs, Somerset and Dorset Horns, and Mountain Sheep. In the horse classes there are prizes of £50 for the best thoroughbred stallion; £30 to £15 for the best stallion for agricultural purposes; and prizes varying from £25 to £10 and £5 for mares, colts, &c.; total prizes for horses £275. The prizes for pigs remain the same as last year; the amount being £64. Mr. Miles, of Dixfield, Exeter, again renews the offer of prizes for shoeing smiths.

The following is a list of the Salisbury Local Prizes:—*Channel Islands Cattle*—A first and second prize of £5 and £3 respectively for bulls of any age, two year-old bulls, yearling bulls, dairy cows, three-year old heifers; *Cattle of any breed*—A first and second prize of £5 and £3 respectively for dairy cows; ditto for heifers. *Sheep* prizes of £5 and £3 for pens of Hampshire Down ram lambs, and ditto for pens of ewe tegs in their wool, part to be shorn in the yard. A prize of £5 for the best pair of working cart horses. Prizes of £5 and £3 for the best New Forest pony; similar prizes for the best mare and foal; and £5 for the best pair of penies.

Prizes of £5 and £3 for Berkshire boar pigs; ditto for breeding sows; ditto for the three best breeding sows above four and not exceeding eight months old. Prizes of £10, £5, and £3, for Wiltshire cheese; £5 for the best sack of wheat grown within 20 miles of Salisbury; and £5 for the best sack of barley; total, £150.

POULTRY PRIZES.—Dr. Brent, one of the stewards of poultry, brought up the prize sheet for his department. The total amount of prizes offered is £150.

ARTS DEPARTMENT.—On the motion of Mr. H. Williams, seconded by Mr. Drewe, the sum of £400 was voted for the erection of a new arts building at the Salisbury meeting.

DAY FOR HOLDING COUNCIL MEETINGS.—After much discussion it was resolved that after the present year the meetings of the Council be held on the last Tuesday instead of the second Saturday in the month: this arrangement not to take effect till the February meeting.

PAYMENT OF JUDGES.—It was resolved on the motion of Mr. H. Fookes "That in future the Society's judges of Stock at the meetings of the Bath and West of England Society be paid £5 each for their trouble, such sum to include all expenses excepting first-class railway fare to and from the place of meeting."

INTERNATIONAL CHEESE EXHIBITION AT PARIS.—The following letter was read by the secretary:—

Office of Committee of Privy Council for Trade,
Whitehall, 4th November, 1865.

Sir,—I am directed by the Lords of the Committee of Privy Council for Trade, to transmit to you for the information of the Bath and West of England Agricultural Society, the accompanying copy of a programme, &c., of a proposed International Cheese Exhibition intended to be held at Paris in December next, and which has been received from His Majesty's Chargé d'Affaires at this Court.

I am, Sir,
Your obedient servant,
J. EMERSON TENNENT.

The Secretary to the Bath and
West of England Agricultural Society.

The exhibition above referred to will take place on the 21st of December.

NEW MEMBERS ELECTED.—Messrs. Ingram and Phillips, Stockton Ironworks, Fordlingbridge, Hants; Mr. Richard Woodward, Chargrove, Cheltenham; Messrs. Wilkinson, Brothers, Market-place, Bath; Mr. Fredk. Shum, Laura-place, Bath; Mr. J. H. Clark, Alwood House, Maidenhead.

CALENDAR OF AGRICULTURE.

Plough stubbles and leys for Lent crops and fallows. In fresh weather repair old fences, and make new ones. Continue the cutting of drains so long as the weather allows. Mend roads and cart-up earths for making composts. Collect for manure, in every shape or form, all earthy and vegetable substances that can be got.

Flood meadows, and lay dry occasionally.

Cut underwoods, and fill up vacancies by planting and layering. Plant all kinds of forest trees, especially ash and oak. Keep fences in good repair, to prevent trespassing—a very sure mark of slovenly management. Raise turnips from the ground in dry fresh weather; give the tops and small roots to young cattle in the yards, and to the store sheep in the fields.

Early lambs will be dropped this month in some

places. Feed the ewes amply, and provide good shelter.

During frosty weather thrash grains very frequently, and litter the yards very often. Collect earths to the compost heaps, and carry lime for mixing with the earths. Carry stones for draining; timber, faggots, and coals for fuel.

The proper arrangements are now made of a systematic management in every department of the winter operations. The live stock require the most vigilant and unremitting attention, in being regularly and amply fed, and in having a dry and comfortable lair in the yard and sheds. Steam roots and meals for cows, pigs, and poultry; give the food in a fresh condition, without any sourness or acidity. Give to the cattle the turnips from the store-pits during stormy weather, but from the

fields daily when the weather permits. The drains and culverts must be all in good current order, to convey the urinary liquids to the tank. The cattle in the yards eat under cover in high cold latitudes, from cribs placed in the shelter-sheds.

The grains and animals, with all moveable articles, being the property of the farmer, are insured at his cost; the buildings by the proprietor, being

his charge. Every kind of rural produce is now insured most safely and economically at the Royal Farmers' Insurance Office, and proprietors and farmers who neglect the yearly precaution by not insuring are most culpably faulty, and commit an injury not only to themselves, but against the public at large,

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Frost may set in early, and then all plants under glasses, in frames, and in warm borders require the protection of matting, fern and littery straw being laid over them. In this way late-sown radishes are preserved under straw, which is raked off in dry sunny weather. Little can be added to the general directions of last month. All is contingent: if the weather be open, there is every probability that it will be wet; and then to trample upon and work ground saturated with water is only to do much harm.

Sea-kale: Pot and excite a second set of plants. Brick pits and darkened frames, with good linings, would be a great convenience, and prevent much litter.

Asparagus is easily forced upon deep beds of leaves raked from woods and parks, avoiding those of laurels and evergreens generally. The plants should be prepared in proper beds for the express purpose, and selected from the best two or three-year-old stock. Brick pits are the best erections; but good frames, set upon leaves, with warm linings, will do well.

FLOWER GARDEN.

Cover the ground with half-decayed leaves, or lay cakes of moss among the shrubs, keeping them in order by small stones; and in the event of snow, lose no time to brush it off evergreens, if the sun shine hot upon them, as alternate thawings and freezings ruin foliage.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR NOVEMBER.

Notwithstanding that large quantities of rain have fallen in most parts of the United Kingdom, the progress of ploughing and sowing has been somewhat rapid. The young wheats are now well above ground, and indicate great healthiness. Increased quantities of wheat have been thrashed out in the leading counties; and most of the markets have been fairly supplied with samples. Really fine qualities have moved off slowly, at about previous quotations; but inferior parcels have given way 1s. to 2s. per quarter; apparently, wheat has seen its highest range of value for the present. The millers are well in stock, and there is no disposition shown to speculate in any kind of produce on the part of the leading houses. The large quantities of grain on passage from the Black Sea ports, and the fall of 2s. to 3s. per quarter in the rates demanded for forward shipment, have tended to depress the trade generally. We are not likely to receive any quantity of either wheat or flour from America during the winter months; but we shall, no doubt, import largely from France, Holland, &c., at prices which will effectually prevent an upward movement in the quotations here. Very little fine English barley has been brought forward, and the inquiry for it has ruled steady, at extreme rates. Inferior parcels have given way 1s. to 2s. per quarter, with a dull sale. Malt has somewhat declined in value; but oats, beans, and peas, have changed hands freely at full prices. The transactions in flour have been to a moderate extent, at late currencies.

The new crop of English wheat is turning out well as to quantity; but the bulk of it is in very middling condition. The imports from the continent have shown a want of quality, consequently have been held less firmly. Barley is certainly about an average crop; but the yield of oats, beans, and peas, though rather larger than in 1864, is deficient.

The reductions in the Bank rate for money to 6 per cent, and the great activity for woollen goods in the manufacturing districts, for shipment to America, have given additional firm-

ness to the wool trade. The sales of colonial wool, at which about 60,000 bales will be brought forward, are going off briskly, at an advance in the quotations of 0½d. to 1d. per lb. English wool has, consequently, commanded rather more money. The supply in the hands of our manufacturers are very moderate, even for the time of year. On the continent, the inquiry for wool has certainly improved.

Most of our markets have been heavily supplied with potatoes in good saleable condition. A few fine samples have realized 110s. per ton; but other qualities have ranged from 50s. to 90s. The losses from disease have been very moderate, and we may safely conclude that large supplies will continue on offer for some time. The moderate range in the value of potatoes must have some influence upon the wheat trade. The imports from the continent have been limited for some time past.

There has been about an average business doing in nearly all kinds of hops, and the quotations have been well supported. The quantities on offer have been moderately extensive, and the imports from abroad have been on a liberal scale. The best new English have sold at 180s. to 190s. per cwt.

The root crops have turned out remarkably well, and of good quality. There is, consequently, a full average supply of cattle food on hand. The outlay for linseed and cakes for some time will be trifling when compared with some former years. There is, however, no disposition on the part of holders to accept lower prices for those articles.

The quantities of hay and straw on offer have been only moderate. The demand has not improved; nevertheless the quotations have been well supported. Meadow hay has sold at from £4 to £5 15s., clover £5 to £7, and straw £1 18s. to £2 5s. per load. The quantity of hay in stack in various parts of the country is large.

The price of nearly all kinds of meat has been very high during the month. Our impression is that the supply of English stock, both beasts and sheep, is gradually decreasing, and that really prime animals will command high currencies for a

considerable period, the large increase in the importations notwithstanding. The great falling off in the arrival of cured provisions from America and other quarters compared with last year—over 1,000,000 cwt.—has, of course, given great firmness to the bacon market, and reduced our supplies of food considerably. At New York, bacon, hams, lard, &c., are much higher in price than in England, and whilst high rates prevail we can hardly anticipate an increase in the shipments.

The Scotch markets have been but moderately supplied with wheat. The trade, however, has been very inactive, on rather lower terms. All kinds of spring corn have moved off freely, at extreme quotations. The shipments of potatoes to the south have been on the increase.

In Ireland no new feature has presented itself in the grain trade. Fine wheat, barley, and oats have sold freely at full quotations, otherwise the transactions have been very moderate. Increased quantities of produce have found buyers on English account.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

In the early part of the month, the supplies of English stock on sale in the leading markets of consumption were very moderate, and in but middling condition. Prime beasts were, therefore, in good request at enhanced quotations. Since then, however, increased numbers have been brought forward, and the upward movement in value has not been supported. The quality of the foreign beasts exhibited has shown signs of improvement, and we are now receiving fewer store animals than usual; and the consequence is that some addition has been made to the supply of meat, and that a check has been given to the high rates current during the greater portion of the year. We do not see, however, how any material reduction can take place in prices, as the arrivals of stock from the continent will be on a moderate scale during the whole of the winter months. The number of diseased animals seized in the Metropolitan Market has been very small, although heavy losses have been sustained in the agricultural districts. Very superior Scots and crosses realized 5s. 6d.; but the closing figure, as a general quotation, was 5s. 2d. per 8lbs.

Rather large numbers of sheep have been brought forward, but, as respects London, about one-third of them have been derived from abroad. Prime downs and half-breeds have sold freely, other kinds slowly; the former have readily produced 6s. 8d., in some instances 7s. per 8lbs.

Increased numbers of calves having been on sale, the veal trade has continued in a most inactive state, at drooping currencies. The reduced rates have ranged from 4s. to 5s. per 8 lbs.

Small pigs have been scarce and dear; whilst inferior pork has sold slowly. The commencement of the season has induced the holders of pork to demand unusually high quotations.

Although the supply of food for cattle is very abundant in most parts of England, strong prices have been realised for hay, and the probability is that that article will continue dear for several months.

The imports of foreign stock into London have been as follows:—

	HEAD.
Beasts	16,254
Sheep	52,517
Lambs	1,269
Calves	2,526
Pigs	7,770
Total	80,336

COMPARISON OF IMPORTS.

November.	Beasts.	Sheep.	Calves.	Pigs.
1864	17,137	34,792	2,970	3,947
1863	11,020	30,347	1,770	2,202
1862	6,839	28,577	1,659	633
1861	5,295	27,833	946	1,241
1860	6,961	22,723	1,604	828
1859	5,927	21,907	997	159
1858	4,787	18,258	1,174	156
1857	4,409	17,830	2,687	136
1856	6,102	16,380	1,152	309
1855	7,367	17,094	1,127	454
1854	7,120	16,604	1,108	369

The total supplies of stock on offer in the great Metropolitan Market have been:—

	HEAD.
Beasts	36,820
Cows	295
Sheep	167,230
Calves	2,858
Pigs	2,811

COMPARISON OF SUPPLIES.

November.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1864	32,600	542	114,300	2,587	2,900
1863	27,704	506	99,130	2,156	3,170
1862	30,139	532	110,020	2,313	3,172
1861	26,590	560	109,370	1,370	3,430
1860	25,400	500	103,600	2,112	2,920
1859	26,492	522	120,840	1,299	2,800
1858	24,856	534	114,643	1,437	2,970
1857	25,383	504	103,120	3,002	3,037
1856	25,444	515	105,750	2,096	3,415
1855	27,411	457	97,460	1,585	3,535
1854	23,442	512	121,031	1,848	2,726

The district arrivals of beasts thus compare with the three previous years:—

	Nov., 1862.	1863.	1864.	1865.
From Lincolnshire, Leicestershire, & Northamptonshire	14,570	9,200	9,300	9,600
Other parts of England	3,450	2,800	2,700	3,550
Scotland	74	309	554	448
Ireland	3,300	2,800	2,000	1,000

Beef has sold at from 3s. to 5s. 6d.; mutton, 4s. to 6s. 8d.; veal, 4s. 4d. to 5s. 4d.; and pork, 4s. to 5s. 8d. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	Nov., 1861.			Nov., 1862.				
	s.	d.	s.	d.	s.	d.		
Beef from	3	0	5	2	3	4	5	0
Mutton	3	2	5	8	3	8	5	8
Veal	4	2	5	4	3	4	5	0
Pork	3	10	5	0	4	0	5	0
	Nov., 1863.			Nov., 1864.				
	s.	d.	s.	d.	s.	d.		
Beef from	3	4	5	0	3	4	5	8
Mutton	3	8	5	8	3	10	6	0
Veal	3	4	4	8	4	0	5	2
Pork	3	4	4	6	3	6	4	8

There has been a considerable increase in the supplies of meat on sale in Newgate and Leadenhall markets. Sales have consequently progressed slowly at drooping prices. Beef closed at from 2s. 10d. to 4s. 8d.; mutton 3s. 6d. to 5s. 4d.; veal 4s. to 4s. 8d.; and pork 4s. to 5s. 4d. per 8 lbs., by the carcass. These quotations show rather an important decline since the commencement of the month.

NOTTINGHAMSHIRE.

We have an abundance of grass on our pasture lands, and the aftermaths have been remarkably heavy. Some say the long pastures have been against the health of stock, which, when they lay down, had too much wet grass about them. There may be some truth in it, and we think it wiser to graze all down as evenly as we can. To let any field run too long must involve loss. Both sheep and cattle have increased in weight considerably the last two months; and it should bring down the price of meat, a very desirable matter with our enormous population. The rinderpest, we hope, is in some measure stayed. It is truly an alarming affair for the farmer to look upon his stock, all in high health and so pleasing to see; and at the same time to be reminded that to-morrow death may be among them and blast his hopes is truly humiliating, and he has the truth forced upon him that the cattle on a "thousand hills is the Lord's." The measures adopted in regard to fairs and markets and the transit of stock must meet with general acquiescence. Let the cattle of the country have the strictest cordon which can be thrown around them; and if it is represented, so contagious, that is all we can do. We hear of no one complaining except the dealers (jobbers), and their general treatment to cattle is often so shameful that it would be a blessing for them to lay aside their craft for a while; the country would spare them well, and they may have been the means of promoting some of our ills. We see cattle and sheep adver-

tised for sale by private contract on the farms of the owners, so that our necessities for the time will soon devise a means for supplying the public wants. Seed time is nearly over, with about the usual breadth of wheat put in. It has not, on some lands, been the most favourable season; but so much depends on the future with wheat, that it is absurd to draw any conclusion. The thrashing of wheat has been almost continuous, and the supply ample enough. We hear few complaints about the yield, and in several instances more have been delivered than sold—a clear proof that it had exceeded the calculation of the seller. The mangel-wurzel crop is heavy, the best we have had for years. The season has been favourable, and more attention is paid to its management. The turnip crop is a partial one, and the Swedish variety small in size. We had too much mildew about them to give a crop, and we doubt their keeping capabilities. One thing we learned last winter, a lesson of some worth—how to economise our roots. They are either food or physic; and by using them more sparingly we have the food, and unsparingly the reverse. Our corn markets have been fairly supplied, and with an upward tendency; we think the lowest point is passed, and the future more hopeful for the producer. Our great season for the hiring of servants is at hand, and so far, there is little alteration in the rate of wages. There would be depression enough were it not that our mining and manufacturing interests absorb such an enormous amount of labour: and it seems strange, with fifty per cent. higher wages about the coal pits, &c., that so many should remain about the homestead of the farmer. Is it the love of rural life? All attempts to do away with our hiring places are, so far, void, and the farmers say they must have rough minds for rough work; so mind does not go for much at the dung-cart—"every man in his order." And so every generation seems to produce a class of individuals who will be at the foot, and laugh at any ameliorating effort. We only repeat what we have so often expressed at this period of the year, that in our opinion our statutes for the hiring of servants are a standing disgrace to the country, and that he who goes to engage labourers at such places promotes one of our great social evils.—Nov. 22.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ANDOVER HOP FAIR.—Many parcels of hops which had been held over by growers and housed from last Weyhill fair were on offer, although the chief supply was in the hands of merchants, which indicates that hop-growers have very generally sold this year's growth. The demand for best samples of hops ruled active, Saxsex hops made from £4 to £5 10s. per cwt., Hampshire growths £4 10s. to £6, and some parcels of Farnhams realised £11 to £12, and Kent samples £6 to £9.

BOSTON FAT STOCK MARKET.—A moderate supply of fat sheep, with a slow trade, at 8d. per lb.

BOSTON HORSE MART.—There was only a meagre show of animals, and buyers did not appear to be very numerous. The best sort of cart colts made good prices, but other kinds were difficult to quit, and many were taken home again unsold. The best two-year-old cart colt that was exhibited was purchased by Mr. Kirkham for £40, the highest price realised throughout the fair. A yearling out of the same mare as the above was sold for £25 10s.

BRECON FAIR.—A large number of sheep were sold at good prices. Among the number were many hill wethers fit for the shambles, which butchers from the iron districts bought readily at prices averaging about 8d. per lb. A good deal of business was also done in the horse fair, especially with the mountain ponies, of which there were many changed hands. Cattle, by order, excluded. There were a great number of pigs, but prices were rather on the decline.

DAVENTRY FAIR for the sale of sheep only. There was not a large supply, and trade was rather dull for all sorts. The best mutton fetched about 6s. per stone, and good lambs for keeping about 40s. each.

DOUXE SECOND TRYST.—The number of sheep on sale never was so small, but though this was the case the supply was equal to the demand. Those brought forward consisted of blackfaced and Cheviot ewes, with a few wethers. The prices for all kinds were as good as at the last tryst; indeed they were, if anything, a shade finer. Mr. James

Graham, Myothill, Denny, purchased a lot of blackfaced ewes and wethers, mixed, at 24s. 6d., which he resold at 29s. Mr. Peter McCaul, Dunblane, sold a lot of blackfaced ewes at 26s. Mr. Forbes McCaul sold a lot of Cheviot ewes to Mr. Graham at 30s. One and two years old colts were selling at from £10 to £25, and good draught horses at from £25 to £36. Mr. Christie, Stirling, sold at from £15 to £35. Mr. Peter Scott, Yettis-o'-Muckhart, sold draught horses at from £30 downwards.

DUMFRIES PORK MARKET.—The present high prices of mutton and beef have led farmers to look forward to high prices. About 200 carcasses were brought forward; but they were in far from good condition for curing. Buyers, on this account, were shy at coming to terms; and the high prices sought also frightened them. On this account the market was dull, and sales moved very slowly till the close. For the best lots from 7s. 4d. to 7s. 6d. per imperial stone was given; for secondary sorts, from 7s. to 7s. 3d.; and for heavy ones, from 6s. 6d. to 7s.

GARSTANG MARTINIAN FAIR.—The market for cattle, according to orders issued by Council, was completely closed. There were not many sheep on sale. However, what were exposed sold at good prices. We have not seen a better show of horses for some years, and a tolerable trade was done in good cart-stags and anything useful, at remunerative prices. We are glad to say that we keep free from the cattle-plague here at present, and for some miles round us.

MARLBOROUGH FAIR.—The number of sheep was under the average; the trade was dull, and prices dear. Mr. Gale, of Burbage, obtained the top price (61s.) for lambs, and also for ewes. As a whole, the prices at Andover and Hleyley fairs were maintained.

SALISBURY FORTNIGHTLY MARKET.—There was a large number of beasts, and among them a fair proportion of good serviceable qualities. The high prices to which beef has been unwarrantably forced up by the unfounded reports of scarcity are now operating against trade, and to-day the greatest difficulty was experienced in obtaining the figures asked. Business, therefore, ruled excessively dull, with a downward tendency; and although many animals remained in the market until five in the afternoon, a clearance was not effected. In the sheep department there was an excellent supply. Previous quotations were asked for the best qualities; but the trade was decidedly inactive, and many pens were left unsold. Some of the local butchers have lowered the price of meat 1d. per lb.; but it is considered that the consumer is entitled to a reduction of quite 2d. per lb. on prime joints. Quotations: Best oxen realised from 12s. to 13s. per score, and heifers from 11s. to 12s.; mutton may be quoted from 7d. to 9½d. for the best Downs, per lb.

SKILTON FORTNIGHTLY FAIR.—No horned cattle. The prices of fat stock sold out of the town were about 7d. per lb. In mutton, best wethers sold at 7d. to 7½d. per lb., and ewes at 6d. to 6½d. Butchers bought very slowly and sparingly. A good show of pork sold at 7d. to 7½d. per lb. Store pigs realized good prices.

ST. COLUMB FAIR was well supplied with fat and store sheep; but the sale, on the whole, was not brisk. Fat sheep fetched 7½d. per lb. There were no bullocks in the fair.

TRURO FAIR.—There were no bullocks, cows, or calves; and only 600 sheep—not one-half the average number usually offered—and for these few sales were dull, at lower prices, 7½d. being the top price for fat sheep. Several flocks were driven home unsold. Farmers generally evinced no disposition to buy, fearing to take the plague to their herds.

YEOVL FAIR was well attended, the supply of stock being moderate. Barreners realized from £16 to £17 a pair. Sheep sold readily, at the following rates: Wethers 44s. to 48s., ewes 41s. to 47s. each. Pigs small supply.

YORK HORSE FAIR.—Two features were strikingly apparent in this annual chartered fair, and these the smallness of number and meagreness of quality of the animals shown. Anything really useful for agricultural or nag purposes was speedily bought at high prices, whilst animals of an inferior order were a drug upon the hands of those who offered them, and numbers of these were consequently left unsold.

IRISH FAIRS.—**CARLANTOWN BRIDGE:** Some splendid looking lots of bullocks—as prime as ever were fed on the fertile fields of Meath—were quickly bought up for England in the early part of the day at £20 to £26 each, which might

be calculated at fully £3 3s. per cwt. sinking offal. Beef, however, was down in price, generally speaking, and the average rate for good quality may be set down at 6d. per lb. on the foot. Store cattle appeared to have improved somewhat in price where they promised to turn out well after stall-feeding, but those out of condition were no more than a drug. The following may be taken as the ruling prices: Three-year-old heifers from £11 10s. to £15 each, two-year-olds £9 to £11, yearlings £4 10s. to £6 10s. each—in a few instances to £7 10s. per head. Bullocks, rising three years, fetched from £13 10s. to £16 each, two-year-olds from £10 to £13, yearlings from £7 to £9. A lot of two-year-old bullocks—certainly the pick of the fair—were sold by Mr. James McCormick to an English dealer at £14 each. Mr. McNally sold another prime lot, of like age, at £13 5s. per head. Milch cows were brought up with much avidity, more particularly by English and Dublin buyers. Of springers and strippers there was a fair show, and all were quickly bought up—the former from £14 to £24, and the latter from £9 to £13 per head. The exhibition of sheep was very fair; wether mutton brought from 8d. to 8½d., and ewe from 7d. to 7½d. per lb. Store hoggets and store lambs sold well. In pigs there was an animated trade, bacon going from 48s. to 56s., and pork at fully 7d. per lb. for prime, in sink; good strong stores £2 to £3 10s. each, while bonnies fetched from 20s. to 28s.; a general clearance was effected in pigs of every description. The horse fair was principally made up of nags of an inferior kind; the highest price given was £45 for a cob.—RATONATH: No beef or sheep. Springers scarce and dear, but pigs sold well. Bacon pigs brought 56s. per cwt., stores £2 10s. to £3 10s., slips or suckers 20s. to 35. Store bullocks were unsaleable, and the few sold were to graziers, at prices which would have been obtained for them last May, and in some instances less. Heifers were in better demand, but at prices that left the feeders nothing for the summer's grass. Not one-fourth of the cattle were disposed of.—BADLYMAHON: The supply of beef was tolerably large, and from 56s. to 65s.

was obtained, the latter for prime quality. Springers and milch cows in fair demand, and realized good prices; dry cattle of good quality were also in brisk demand, three-year-old heifers £12 to £15 two-year-olds, of which there was an abundance, £8 10s. to 10 gs. each; yearlings £5 10s. to £7 a head. The show of sheep was below the average. Some few lots of ewes sold at 48s., store hoggets 50s. to 55s. each. Best wether mutton 7½d. to 8½d. per lb., and the ewe about 1d. below that quotation. Lamb a small supply, with a brisk demand, at high prices; in some instances 48s. a head was obtained for them. Good bacon pigs sold at from £4 10s. to £6 10s. each; store ditto vary from £2 to £4 each. Suckers and weanlings scarce and dear.—TULLOW: The demand was rather dull for stores, especially for bullocks. Cows for stall feeding were much looked after, at say £11 to £15; yearlings brought from £7 to £9, and younger animals were proportionately high. Springers and milch cows met a fair demand at high prices. First-class beef sold at £3 per cwt., second ditto 50s. to 56s. The supply of sheep was exceedingly small, and prices of mutton may be quoted at 8d. to 8½d., inferior quality 7d. to 7½d. per lb. Lambs averaged from 35s. to 45s. The pig fair, which was held on the previous day, was very well supplied with a good description of animals. Pork went at 56s. per cwt., being rather an advance on late quotations; stores 56s. to 60s., and young pigs were £1 10s. each.—GORESBRIDGE: Store stock was more plentiful, and sold at a shade lower than the prices of the recent fairs. Sheep were also in very short supply. Hoggets were more plentiful, and sold well. The attendance of buyers was large, but the business done was confined to store stock. Fat cows averaged from £10 to £12, new milch cows £12 to £14, two years old bullocks £7 10s. to £9 10s., yearlings £5 to £7, weanlings £3 to £4 10s. Fat sheep brought from £2 10s. to £3 5s., hoggets £1 15s. to £2. The pig fair took place the day before, and was well supplied. Bacon rated at from 53s. to 55s. per cwt.; stores went at from £2 to £2 10s. each, bonhams 35s. to 42s. per couple.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The final week of the month of October, which we could not include in our last report, closed briskly with an advance of 2s. on wheat, and 3s. per sack on town-made flour. Indeed, it was a period of movement throughout, barley being 1s. to 2s. higher, as well as beans, while oats improved 6d. to 1s. per qr. November has presented the following features. For the first fortnight it was of a reasonable character. There was plenty of fog, more especially at the commencement; but with most of the time open and partly brilliant, farmers lost no opportunity of doing a large amount of business in the way of seeding their lands. Afterwards it became more unsettled, and, finally, a week of storms and deluging rain brought frightful disasters by land and sea, and left many of the heavy lands in anything but a condition for finishing the work. Let us hope, however, with good drainage and drying winds, everything will be completed before Christmas. The return of damp has made sad havoc with the newly-thrashed samples, and brought dulness into the trade after a good run of business, and the samples are now so bad that we can hardly hope for much amendment before the nipping frosts of next January set in. The market received its first check on the second Monday, and, so far as we can fairly speak of qualities unfit for

the mill, the movement has been downward. Nevertheless, everything good and dry has found buyers, even in the London markets, where the wealth of millers enabling them to import and hold foreign stocks, they are comparatively independent. The ascensional movement of the averages, however, show the real state of the country, and we are as far as ever from believing in a return to low prices as a rule, whatever fluctuation may prevail. As respects foreign countries, France has lately been an exception to the general movement throughout Europe, having lowered prices, say from the highest 1s. to 2s. per qr.; and yet France herself was among the first to report an inferior crop. This state of things may arise from the fact that free trade in that country is yet a novelty, and that the last importation burnt the fingers of importers, so that they are wanting in spirit, and rather disposed to take things as they come, or to follow the English plan of taking a present profit, and leave the future to itself. The markets in the Baltic, though so soon after harvest, are really getting excited with the belief of their future incapacity to make shipments or possibly provide for themselves. This is the case in Dantzic, Poland, and Denmark, while the Marks district in the vicinity of Hamburg is said not to have the tenth of a crop, and speculators are wild for rye at proverbially quiet Berlin.

Not much, we hear, is to come from the interior of Southern Russia; still less from the United States, compared with their former facilities of shipment; for statistics tell us that while in 1863 their estimate was 179 thousand bushels of wheat, 1864 was only about 160 thousand, and 1865 but 148 thousand; so that from the year of export, 1863, the diminution in round numbers is about four millions of quarters, or two-thirds of our average English receipts. Put the increasing cattle plague to this poor account, and what have we prospectively to look on but the odds and ends of shipments, or such as we can get? The following prices were recently quoted at the places named: At Paris the best white wheat was quoted 44s.; at Antwerp, red Baltic 48s.; Zealand, at Maestricht, 45s.; Wahren, at Hambro', 51s. (not worth over 50s. here); Holstein for spring 50s.; new wheat at Dantzic 50s. f. o. b. Floating cargoes of Ghirko 44s.; Banat wheat at Venice 41s.; Upper Canada wheat at Montreal 40s. per 480lbs.; Milwaukie and Chicago 39s., there having been a demand for the United States. At New York, old Chicago wheat was worth 40s. per 480lbs., and amber State 53s. 6d. per 480lbs. free on board.

The first Monday in Mark-lane commenced after small supplies of Wheat, both English and foreign. The show of samples this morning on the Kentish stands was very scanty, but rather more plentiful on those of Essex. Part of the supply being in good condition, an advance of 1s. per qr. was readily obtained, and the inferior found a better sale. The foreign trade, though not extensive, was very firm, and in some instances 1s. per qr. more money was paid in retail. Though the arrivals off the coast were not numerous, floating cargoes were rather lower. This week the London advance was generally sustained in the country, but without excitement, though some places of importance noted an improvement of 2s. per qr., as Hull, Stockton, Bourn, Spilsby, and Thirsk. On the other hand, some towns only quoted the previous rates, as Barnsley, Newark, and Newbury. Edinburgh was 1s. per qr. higher, but Glasgow was only firm. The tone of trade was against buyers at Dublin, but no rise in prices was noted.

On the second Monday the English supply was somewhat better, and that from abroad was about doubled. Kent again sent up but few samples this morning to the London market, and Essex only about an average number. Yet the trade showed symptoms of reaction, and the best qualities went off with difficulty on barely the same terms, and some of the inferior was unsold. The foreign trade continued heavy, and some factors accepted 1s. less money for Russian qualities, but the majority of holders were firm. Floating cargoes were without change of value. The country markets this week were less buoyant, and several gave way to the extent of 1s. per qr. Among these were Hull, Boston, Spalding, Maidstone, Rochester, and Gloucester; but other places were firm, as Birmingham, St. Ives, Sleaford, Leighton Buzzard, &c. Liverpool was down 2d. per cental on the week. Both Edinburgh and Glasgow were 1s. per qr. lower, but Dublin was only dull.

The third Monday was supplied with rather less

English and foreign than in the previous week. A few more samples were seen this morning on the Kentish and Essex stands; but the condition was much affected by fully a fortnight's damp weather. The very few parcels of dry that were found about maintained the previous currency; but it would have been difficult to clear those that were damp at 1s. to 2s. less money, as they were below millers' use. Though the state of the English trade was calculated to increase the demand for dry foreign, yet scarcely any inquiry was manifest, and to have sold freely 1s. less must have been accepted. With better arrivals off the coast, there was no disposition to make purchases. The damp weather influencing every market in the country, there was universal dullness, yet without a decided decline on dry and fine qualities, these being scarce; and, on this score, there was so general an agreement that it seems needless to particularize. Glasgow declined 1s. per qr.; but Edinburgh was not decidedly cheaper. At Dublin, both the native and foreign trade were heavy, and rather in favour of buyers.

The fourth Monday was moderately supplied both with English and foreign samples. The quantity offering from Kent and Essex was small; but the condition was as miserable nearly as on the previous week, and the consequence was very little could be sold: really fine and dry lots, being scarce, were fully as dear, and old were more inquired for at the previous rates. There was rather more doing in foreign qualities; but the dull state of the market encouraged buyers to expect a decline, which, however, was not acceded to, the Baltic markets all coming high with reports as to the crops in Germany being worse than previously.

The imports into London for four weeks were 23,207 qrs. English, 48,195 qrs. foreign, against 18,846 qrs. English, 81,755 qrs. foreign for the same period in 1864. The London averages commenced at 45s. 1d. and closed at 49s. 4d. per qr. The general average began at 42s. 4d. and finished at 46s. 11d. per qr. The exports from London in four weeks were only 342 cwts. flour. The imports into the kingdom for the week ending 18th November were, in wheat 1,922,849 cwts., in flour 265,697 cwts.

The flour trade throughout the month has been very quiet, and scarcely any change of prices can be noted, though the last markets closed dull for country sorts; and rates were more nominal than real, from the absence of a demand, and increased supplies. But foreign arrivals have continued very short, both in sacks and barrels; and the lowness of stocks have kept such at full value. Fine extra qualities of American have even brought 30s. per barrel, and French to 36s. per sack; but Norfolks can hardly be valued over 33s., though the better marks have a higher range. Neither in Canada nor New York were prices suited to the English market; and, without an advance here, or a reduction there, there is very little prospect of supplies. The imports into London for four weeks have been 80,892 sacks country, 1,524 sacks 3,388 barrels foreign, against 54,803 sacks country, 749 sacks 10,856 barrels foreign for the same period in 1864.

IMPERIAL AVERAGES

For the week ended November 18, 1865.

Wheat	71,570 ³ / ₈ qrs.	46s. 11d.
Barley	63,816 ¹ / ₂ ..	35s. 7d.
Oats	5,240 ¹ / ₂ ..	22s. 9d.

COMPARATIVE AVERAGES.

Years.	WHEAT.		BARLEY.		OATS.	
	Qrs.	s. d.	Qrs.	s. d.	Qrs.	s. d.
1861 ...	82,003 ³ / ₈	59 10	79,738 ³ / ₈	37 6	10,520 ³ / ₈	22 7
1862 ...	65,475 ¹ / ₂	49 4	75,247 ¹ / ₂	36 4	12,672 ³ / ₈	21 5
1863 ...	87,492 ³ / ₈	39 10	83,522 ³ / ₈	34 0	8,017 ¹ / ₂	18 9
1864 ...	71,616 ¹ / ₂	38 9	77,499 ³ / ₈	30 1	5,023 ³ / ₈	19 11
1865 ...	71,570 ³ / ₈	46 11	63,816 ¹ / ₂	33 7	5,240 ¹ / ₂	22 9

AVERAGES

FOR THE LAST SIX WEEKS:	Wheat.		Barley.		Oats.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Oct. 14, 1865	41 11	30 4	20 11	20 11	20 11	20 11
Oct. 21, 1865	42 1	30 9	20 11	20 11	20 11	20 11
Oct. 28, 1865	42 4	30 11	21 0	21 0	21 0	21 0
Nov. 4, 1865	43 4	31 0	21 6	21 6	21 6	21 6
Nov. 11, 1865	43 3	31 6	22 0	22 0	22 0	22 0
Nov. 18, 1865	46 11	33 7	22 0	22 0	22 0	22 0
Aggregate Average	43 8	31 4	21 6	21 6	21 6	21 6
Averages last year	38 9	30 1	19 11	19 11	19 11	19 11

FLUCTUATIONS in the AVERAGE PRICE of WHEAT.

Price.	Oct. 14.	Oct. 21.	Oct. 28.	Nov. 4.	Nov. 11.	Nov. 18.
46s. 11d.
45s. 3d.
43s. 4d.
42s. 4d.
42s. 1d.
41s. 11d.

PRICES OF SEEDS.

LONDON, MONDAY, Nov. 27.—The market for seeds has ruled firmer during the past week. Since Friday there has been renewed inquiry for French red Cloverseed, at full prices, buyers paying 1s. to 2s. more than they were willing to give last Monday. White Cloverseed meets more attention. Trefoils are firm in value, with improving inquiry. Canaryseed, with small arrivals, commanded full rates.

CUTLER AND BARKER, Seed-factors.

BRITISH SEEDS.

MUSTARD, per bush, white	10s. to 12s.
CANARY, per qr.	50s. 56s.
TARES, winter, new, per bushel	5s. 0d. 5s. 6d.
CLOVERSEED, red	—s. —s.
CORIANDEE, per cwt.	—s. —s.
TREFOIL	27s. 28s.
LINSEED, per qr., sowing 56s. to 62s., crushing	54s. 58s.
RAPESEED, per qr.	72s. 76s.
LINSEED CAKES, per ton	£9 10s. to £10 10s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS.

CORIANDEE, per cwt.	20s. to 22s.
CABBAGE, "	—s. 33s.
CLOVERSEED, red 42s. to 50s., white	—s. —s.
TREFOIL	25s. 26s.
HEMPSEED, small —s. per qr., Dutch	—s. 48s.
LINSEED, per qr., Baltic 58s. to 60s. Bombay	68s. —s.
LINSEED CAKES, per ton	£9 10s. to £11 0s.
RAPESEED, Dutch	—s. —s.
RAPE CAKE, per ton	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Nov. 27.—Our market remains very quiet, and without change since our last report, no sales of any importance having taken place during the past week. There is still a fair demand for the better class of samples on hand at prices which fully support our former quotations: but we have very little doing in inferior grades of this year's growth, which are difficult to move except at reduced rates. There has been a better inquiry this week for yearlings and olds.

Mid and East Kents ...	100s., 147s., 190s.
Earnhams & Country. ...	100s., 126s., 160s.
Weald of Kents ...	80s., 115s., 130s.
Sussex ...	70s., 100s., 110s.
Yearlings ...	95s., 120s., 135s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Nov. 27.—During the past week the arrivals coastwise have been limited, but rather heavy by rail; the trade slow, except for the best samples. The following are our quotations:—

Yorkshire Flukes ...	90s. to 105s.
" Regents ...	70s. to 80s.
Dunbar Regents ...	70s. to 80s.
Perth, Forfar, and Fife Regents ...	60s. to 70s.
French and Belgian Whites ...	50s. to 55s.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Nov. 27.—The supplies of Potatoes on sale are tolerably large. Most descriptions are in fair demand, at about the prices of Monday last. The total import into London last week was 320 tons, chiefly from French ports.

Yorkshire Regents	65s. to 80s. per ton.
Flukes	80s. to 110s. "
Rocks	50s. to 65s. "
Scotch Regents	65s. to 80s. "
Kent and Essex Regents	70s. to 90s. "

COUNTRY POTATO MARKETS.—DONCASTER, Saturday last: There was an average show of potatoes at market. Prices ruled from 6s. to 6s. 6d. per load of 15 stone.—YORK, Saturday last: There was no diminution in the supplies, but the weather being very stormy the market was a dull one; nevertheless, the prices were rather higher. The quotations are 7s. per tub of 250 lbs., and 6d. to 7d. per peck retail.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Nov. 27.—We note a dull trade, at declining prices; indeed, Butter is generally 4s. to 5s. per cwt. lower.

Dorset, fine	136s. to 138s. per cwt.
Devon	126s. to 128s. per cwt.
Fresh	13s. to 15s. per dozen lb.

ANDOVER CHEESE FAIR.—A brisk sale, dairy farmers obtaining an advanced value for their produce; but the increasing demand for milk by London milkmen has induced many cheese and butter dairymen in Hamts to abandon the cheese press and butter churn, and send their milk to London.

BRECON CHEESE FAIR.—The supply of cheese was not quite so large as last year. Skim cheese about 5d. to 5½d. per lb.

CREWE CHEESE FAIR.—There were 50 tons of cheese. The prices were lower than last fair, ranging from 55s. to 70s. per cwt.

GLASGOW, (Wednesday last.)—Arrivals of cheese moderate, and mostly secondary; but with those lying over, the market is kept full. About 15 tons passed the weigh-house, and, to make sales, 2s. to 3s. less had to be taken for late-made. Dunlop, new 58s. to 64s.; Cheddar-made, new 61s. to 66s.; skim-milk 26s. to 28s. per cwt.

COVENT GARDEN MARKET.

LONDON, SATURDAY, Nov. 25.—The state of the market, both as regards supply and demand, is much the same as that given in our last report, with the exception of pine-apples, which are rather more abundant than they were last week. Pears still consist chiefly of Marie Louise, Duchesse d'Angouleme, Beurré Diel, and Van Mons Leon le Clerc. Grapes have slightly advanced in price. Kent filberts continue scarce. Oranges begin to make their appearance in considerable quantities. Potatoes of good quality are plentiful. French asparagus continues to make its appearance, and sells readily at high prices. Flowers chiefly consist of orchids, heaths, mignonette, chrysanthemums, Chinese primulas, and roses.

FRUIT.

Pine Apples, per 100	4 0 to 6 0	Oranges, per 100	4 0 to 10 0
Grapes, per lb.	4 0 to 8 0	Lemons, per 100	8 0 to 14 0
Melons, each	3 0 to 5 0	Strawberries, per 100	2 0 to 3 0
Apples, per sieve	2 0 to 3 0	Brazil, per bushel	15 0 to 0 0
Pears, per sieve	2 0 to 4 6	Almonds, per bushel	18 0 to 20 0

VEGETABLES.

Cabbages, per dozen	1 0 to 2 0	Beet, per dozen	1 6 to 2 0
Sea Kale, per punnet	3 0 to 4 0	Shallots, per lb.	0 8 to 0 0
Potatoes, York Regents, per ton	50 0 to 100 0	Garlic, per lb.	0 8 to 0 0
Rocks, per ton	25 0 to 65 0	Lettuces, per dozen	1 0 to 0 0
Flukes, per 500	10 0 to 140 0	Endive, per score	1 0 to 2 6
Kidneys, per cwt.	8 0 to 12 0	Artichokes, per dozen	4 0 to 6 0
Carrots, per bunch	0 4 to 0 6	Horsedisch, per bunch	1 0 to 4 0
Turnips, per bunch	0 4 to 0 6	Mushrooms, per pottle	1 0 to 2 6
Celery, per bundle	1 0 to 1 6	Parsley, per doz. bun.	2 0 to 4 0
Cucumbers, each	0 9 to 1 0	Herbs, per bunch	0 6 to 0 0

LEADENHALL LEATHER MARKET.

LONDON, SATURDAY, Nov. 25.—Moderate supplies of leather are on sale. Dressing hides, calf-skins, offal, and medium English butts move off steadily at full prices, otherwise the leather trade is quiet, on former terms. Raw hides are in slow request at late rates.

CROP HIDES.

ENGLISH.		d.		d.	
28 to 35	.....	11	to 14		
32 to 40	.....	11½	15		
40 to 45	.....	12½	16½		
45 to 50	.....	14	17½		
50 to 55	.....	16	19		
55 to 60	.....	17	20		

BUTTS.

ENGLISH.		d.		d.	
17 to 16	.....	13½	17		
17 to 20	.....	13½	20		
17 to 24	.....	14½	24		
25 to 23	.....	16	27		
29 to 32	.....	18	30		
33 to 36	.....	20	31		

FOREIGN.

16 to 20	.....	11½	20		
21 to 24	.....	11½	20		
25 to 28	.....	11½	22		
29 to 32	.....	11½	24		
33 to 36	.....	12	25		
36 to 44	.....	12½	24		
44 to 50	.....	13	25		

OFFAL.

		d.		d.	
English Shoulders	.....	12	15		
Do. Cheeks and Faces	.....	6½	9		
Do. Bellies	.....	9	11		
Do. Middles do.	.....	11	13		
Foreign Shoulders	.....	10	12		
Do. Necks	.....	8	10		
Do. Bellies	.....	9	10½		
Do. Middles do.	.....	10	12		
Dressing Hide Shoulders	.....	10	12		
Do. do. Bellies	.....	7½	9		
Kip Shoulders	.....	5	7		
Do. Bellies	.....	5	7		

DRESSING HIDES.

		d.		d.	
Common	.....	20 to 24	11 to 12½		
Do.	.....	25 to 28	11 to 12½		
Do.	.....	30 to 34	11½ to 12		
Do.	.....	35 to 40	12 to 15		
Saddlers'	.....	30 to 35	13 to 16		
Do.	.....	35 to 50	15 to 17		
Bulls	.....	10	12		
Shaved	.....	14 to 16	13½ to 15		
Do.	.....	17 to 19	12½ to 15		
Do.	.....	20 to 23	12 to 14		
Do.	.....	24 to 28	12 to 13½		
Scotch do.	.....	16 to 24	12 to 16		
Coach, per hide	.....	23s. to 26s.			

HORSE BUTTS. SHAVED.

		d.		d.	
English	.....	11 to 13	13 to 15		
Do.	.....	10½ to 12	12 to 14		

HORSE HIDES.

		lbs.		lbs.		d.		d.	
English	.....	13	18	10 to 12½					
Do.	.....	14	14	11 to 13½					
Spanish, salted, without butts,	.....	s. d.	s. d.						
per hide	.....	6	9	10 to 15 0					
Do. do.	.....	9	12	11 to 17 6					
Do. do.	.....	7	10	10 to 16 0					
Do. dry do.	.....	8	8	11 to 0					
Do. do.	.....	9	11	10 to 14 0					
Do. do.	.....	6	6	8 to 8 0					

CALF SKINS.

		lbs.		lbs.		d.		d.	
Av. weight,	.....	20 to 30	20 to 30						
per dozen	.....	30 to 35	20 to 30						
Do.	.....	35 to 40	21 to 29						
Do.	.....	40 to 45	21 to 27						
Do.	.....	45 to 50	20 to 28						
Do.	.....	50 to 60	19 to 27						
Do.	.....	60 to 75	18 to 25						
Do.	.....	75 to 90	16 to 22						
Do.	.....	85 to 110	14 to 20						
Welsh, unaged,	.....	25	35	16 to 21					
Av. weight, p. doz.	.....	25	35	16 to 21					
Do.	.....	35	50	16 to 30					

KIPS.

		lbs.		lbs.		d.		d.	
Petersburgh	.....	7	9	10 to 18					
Do.	.....	9	10	15 to 19					
Do.	.....	9	10	15 to 19					
Do.	.....	11	13	14 to 17					
E. L. dry salted	.....	5	7	18 to 23					
Do.	.....	7	9	16 to 20					
Do. seconds	.....	15	18						
Do. thirds	.....	11	14						
Do. inferior	.....	7	10						

SHEEP SKINS.

Basils, unstrained, per lb.	.....	10	18
Do. strained, per lb.	.....	10	18
Do. facing, per doz.	.....	7s. 22s.	
White Sheep & Lambs	.....	4	10
Do. strained	.....	8	20
Do. aprons	.....	10	26
Tan Sheep and Lambs	.....	10	26
Sumach roans	.....	16	35
Do. skivers	.....	10	24
Bark skivers	.....	10	26

SUNDRIES.

		s.		s.	
Hog Skins, best	.....	each	8 to 14		
Do. seconds	.....		5 to 8		
Seal Skins, split, per dozen	.....		40 to 70		
Do. for bindings	.....		35 to 75		
Calf Skins, Sumach,	.....		30 to 45		
tanned	.....		30 to 50		
Do. white	.....		30 to 50		
Horse Hides, white, each	.....		8 to 15		
Hide Splits, per lb.	.....	7d.	to 11d.		

BARK, &c.

LONDON, SATURDAY, NOV. 25.

		£ s. d.		£ s. d.	
English, per load of 45 cwt. delivered in	.....	16	0 to 17		
London	.....	10 to 18	0		
Coppice	.....	5	0 to 6		
Dutch, per ton	.....	5	0 to 6		
Hambro'	.....	5	0 to 6		
Antwerp tree	.....	6	0 to 7		
Do. Coppice	.....	6	10 to 7		
French	.....	0	0 to 0		
Mimosas Chopped	.....	9	0 to 10		
Do. Ground	.....	10	0 to 11		
Do. Long	.....	7	0 to 9		
Cork Tree, Barbary	.....	4	0 to 6		
Do. Sardinian	.....	8	0 to 10		
Valonia, Smyrna	.....	14	0 to 23		
Do. Cunata	.....	16	0 to 20		
Do. Moraca	.....	12	0 to 20		
Ferra Japonica	.....		20 to 21		
Gambier in bales	.....		26 to 27		
Ditto free embes	.....		24 to 27		
Cutch	.....		10 to 13		
Divi Divi	.....		13 to 16		
Myrabolans	.....		13 to 16		
Sumach, Sicily, p. cwt.	.....	16s.	to 17s. 6d.		

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, NOV. 25.

		s.		s.		d.		d.	
Market Hides:	.....							
56 to 64lbs.	.....	0	3	0	3½				
64 to 72lbs.	.....	0	3	0	3½				
72 to 80lbs.	.....	0	3½	0	4				
80 to 88lbs.	.....	0	3½	0	4				
88 to 96lbs.	.....	0	4	0	4½				
96 to 104lbs.	.....	0	4½	0	5				
104 to 112lbs.	.....	0	5	0	5½				
Horse hides, each	.....		0		0 to 10				
Calf skins, light	.....		2		0 to 4				
Full	.....		6		0 to 6				
Polled sheep	.....		10		0 to 12				
Half-breds	.....		8		0 to 9				
Downs	.....		5		0 to 6				
Shearlings	.....		0		0 to 0				
Lambs	.....		0		0 to 0				

CHICORY.

LONDON, SATURDAY, Nov. 25.—Most descriptions of Chicory are in fair demand. On the whole, the trade is steady, at late rates.

DELIVERABLE FROM WHARF IN BAGS, EXCLUSIVE OF DUTY.					
Harlingen	£8 0 to £9 10	Antwerp	.....	£9 0 to £9 15
Bruges	9 0 to 11 0	Hamburgh	.....	8 15 to 9 5

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, Nov. 27.—The activity in the demand for Colonial Wool at the sales now in progress has produced a firmer feeling in this market. The amount of business doing is only moderate, yet there are very few holders willing to sell except at enhanced rates. The supply of Wool on offer is very moderate.

CURRENT PRICES OF ENGLISH WOOL.			
FLEECES—Southdown hoggets	.....	per lb.	1 8 to 1 9
Half-bred ditto	.....	per lb.	1 11½ to 2 0
Kent fleeces	.....	per lb.	1 10½ to 2 0
Southdown ewes and wethers	.....	per lb.	1 8 to 1 8½
Leicester ditto	.....	per lb.	1 10½ to 2 0
Sorts—Clothing	.....	per lb.	1 6 to 1 11
Combing	.....	per lb.	1 5 to 2 0

LIVERPOOL WOOL MARKET.—Nov. 25.

SCOTCH.—There is still a limited demand for Laid Highland, but the stocks are light and no pressure to sell. In Cheviots a moderate business is doing about late current rates.

		s.		s.		d.		d.	
Laid Highland Wool per 24lbs.	.....	13	0 to 20						
White Highland do.	.....	23	0 to 26						
Laid Cheviot do. unwashed	.....	23	0 to 30						
Do. washed	.....	24	0 to 28						
White Cheviot do. washed	.....	40	0 to 48						

FOREIGN.—There has been a fair demand and considerable business done during the week at full late current rates, no doubt stimulated by the advance obtained at the colonial sales now in progress in London.

WOOL.—FRANCE: At Havre, Buenos Ayres wool, in a dirty state has made ls. 5½d. to 2s. 2d.; Montevideo, in a dirty state, ls. 5½d. to 2s. 2d.; and La Plata sheep's hides ls. 1d. to 1s. 2d. per kilogramme (a kilogramme is the fiftieth part of an English cwt.). At Marseilles, washed Syrian has made 2s. 3½d. and Persian ls. 9d. per kilo.

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons)	.....	£12 5s. to £12 10s. per ton.
Bones, £6 10s. per ton.	.....
Animal Charcoal (£70 per cent. Phosphate) £5 per ton.	.....
Coprolite, Cambridge, whole £2 5s. to £2 8s., ground £2 15s. to £3; Suffolk, whole £1 18s. to £2, ground £2 10s. to £2 12s. per ton.	.....
Muriate of Potash, £13 to £14 per ton.	.....
Nitrate of Soda, £15s. to £15 10s. per ton.	.....
Sulphate of Ammonia, £14 to £15 per ton.	.....
Gypsum, 36s. per ton. Superphosphate of Lime, £5 to £5 5s. per ton.	.....
Sulphuric Acid, concentrated 1s 5½d. per lb., brown 17½d. per lb.	
Blood Manure, 66s. to 47s. per ton. Dissolved Bones, 46 15s. p. ton.	

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