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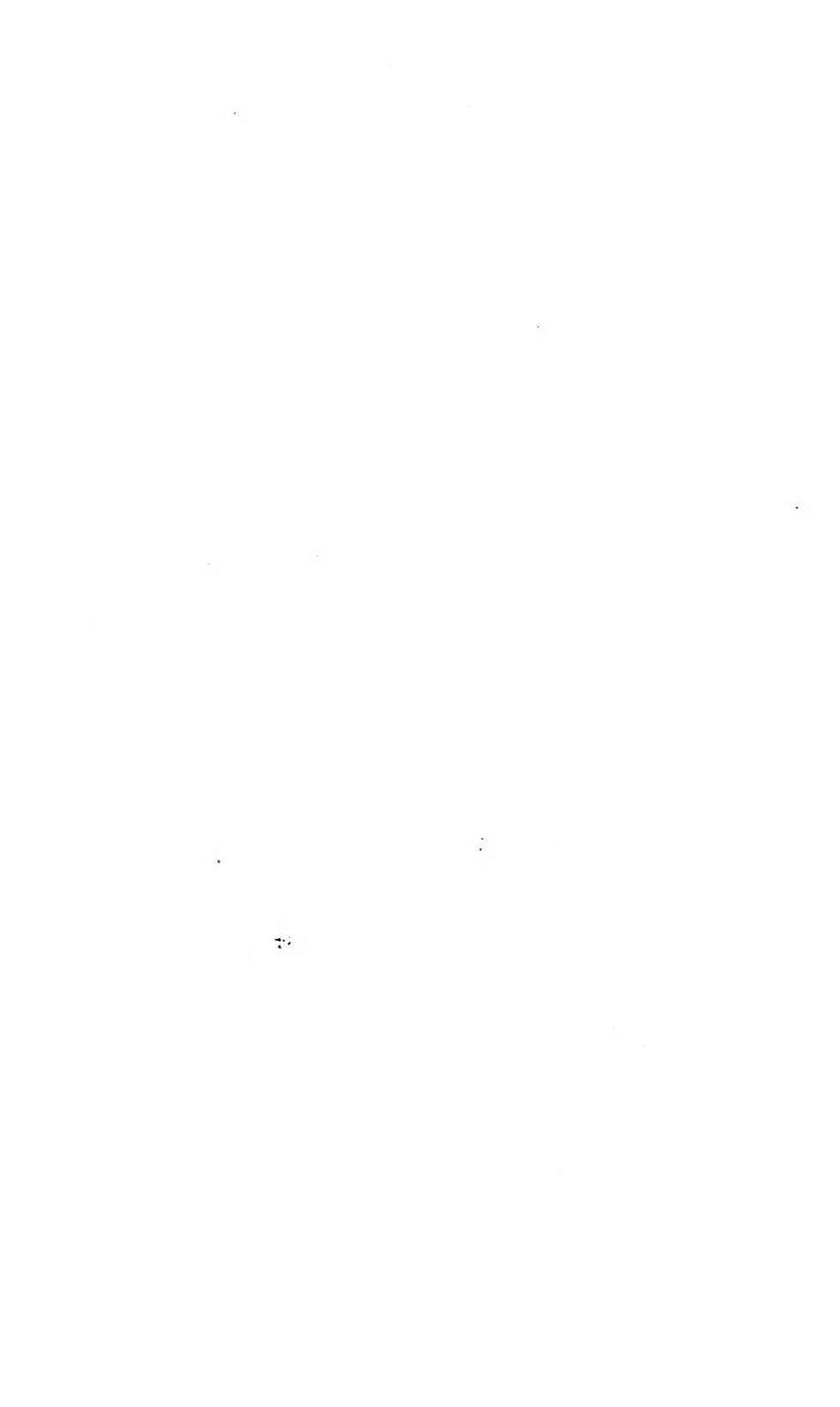
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Yours sincerely  
J. Allen Ransome



# THE FARMER'S MAGAZINE.

VOLUME THE ELEVENTH.

(THIRD SERIES.)

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JANUARY TO JULY, MDCCCLVII.

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# THE FARMER'S MAGAZINE.

JANUARY, 1857.

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## PLATE I.

PORTRAIT OF MR. JAMES ALLEN RANSOME.

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## PLATE II.

NAPOLEON THE III.; A HEREFORD BULL.

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### JAMES ALLEN RANSOME.

Here, reader, is the pleasant countenance of Allen Ransome! A man born to be merry and wise, if ever there was one yet—just in the middle of some racy anecdote, that none can tell like himself; and that will bring us to the point a good deal quicker and better than all the learned treatises that ever were written, or all the long speeches that have to be spoken.

Let us show our appreciation of so excellent a model, and go at once to the point of our own story. James Allen Ransome, then, was born at Yarmouth in July, 1806; he has consequently now just rounded the fiftieth year of his age. The county of Norfolk, however, has little claim on him beyond that of mere birth-right. So early as 1809 he removed with his father's family to Ipswich, dating from which town as his home, he completed his education at Colchester in 1820, after having spent four years there. Immediately on his leaving school "for good" he was bound apprentice to his grandfather, father, and uncle, who were then carrying on business in Ipswich as Ransome and Sons. He left home again in 1826 for Yoxford, where he continued to manage a branch business of the firm up to 1829. This was rather an eventful year for him, as during its course he entered into two dif-

ferent partnerships. That is to say, he joined the house then trading under the altered title of J. R. and A. Ransome, and he married: two memorable epochs in any man's career. This brought him once more into the immediate neighbourhood of Ipswich; which, however, he again forsook for Yoxford in 1833; ultimately returning in 1839 to Ipswich, where he continues to reside as one of the leading partners of a firm now written as Ransomes and Sims.

The energetic character of Mr. Ransome's labours first began to fairly develop itself during his second sojourn in Yoxford. Thoroughly feeling the advantages which should come from such associations, he became mainly instrumental in establishing the Yoxford Farmers' Club. He attempted this on something of a new, or at any rate on a principle very rarely tried up to that time. As secretary he organised the discussion, by the members, of questions of practical agriculture, with the view of publishing reports as to reliable results. The success of such plan is now well known. In his own and the adjoining counties it was almost immediate. Closely following his example, and chiefly through his assistance, similar clubs were soon brought into action at Harleston, Beccles, Halesworth, Wren-

tham, Framlingham, Wickham Market, Hadleigh, and Ipswich. The good thus achieved was at once apparent; and similar institutions began to spring up, all over the county. Amongst the best of these, such clubs as the Harleston, the Hadleigh, and the Halesworth have always held a very high position. But Mr. Ransome did not stop here. In conjunction with the late lamented Mr. William Shaw, Mr. Robert Baker, and one or two others, he set the London Farmers' Club first going, the main features of which still very much resemble those of the little Yoxford club, as established some ten years earlier—the discussion of practical results, and reporting the meetings. It was in this district, too, that he was one of the first to introduce the “allotment system” for labourers; a means, which, however coolly received at the outset, has also come to be gradually adopted. Need it be told that when Mr. Ransome left Yoxford, in 1839, his friends and neighbours—and with Allen Ransome the terms are synonymous—presented him with a handsome and becoming testimonial in plate?

Some few years before this, Mr. Ransome had directly assisted in forming a Society of still greater influence in its effect on the agriculture of this country. He was one of the little knot from which it sprang; he was one of the very first members enrolled; and he still continues to take his seat as one of the Council of the Royal Agricultural Society of England. There is no frequenter of its meetings but must know him. Indeed there have been few of any importance in the three kingdoms but which he has visited, and at which we trust he may be greeted for many years yet to come.

Very many who read this will themselves be able to speak to Allen Ransome as a man of business, who by his integrity and ability has justly reached the highest position. Many more will remember him, perhaps, as the most agreeable of companions and the most welcome of friends. Others, again, will associate his presence with those fluent, happy addresses he now and then rattles off; speeches so perfect in their style and delivery as to generally defy the art of the reporter. To appreciate such orations you must hear “Allen's” own musical voice, and watch the lighting up of his pleasant countenance. All, however, may not have enjoyed, as we have, the opportunity of seeing him in his own home, or following him through his own town. The kindly greeting and good word to everybody, and the deeds which carry out all these words imply. We question very much whether there be such another happy family in England as the thirteen or fourteen hundred men constantly employed in Messrs. Ransomes' works at Ipswich. What a treat it is to go over these—especially if you have the head of the house himself to guide

you—and to note not only all the triumphs of art and skill, but to mark also how the heart has its due share in the business. To see, as you do, at every turn and in every face that the profits of the master are nowhere more studied than the comforts of his men!

If we say more, we shall but make our hero mortal, and chronicle him, like most of us, as not proof against some little weakness or other. That of Allen Ransome, if such it be, is a national one—the love of a horse. The neatest hack at the Suffolk shows is almost sure to be “Mr. Ransome's.” Himself a good horseman, and a good judge, no wonder he confessed, in the openness of his heart, as we once heard him, that “much as he loved a steam-engine, he loved a horse still more!”

The firm of Ransomes was established in the last century by Mr. Robert Ransome, the grandfather of the subject of this notice. It was Robert Ransome who took out the first patent for manufacturing cast-iron chilled ploughshares, and thus by making the under-side much harder than the upper, preserving a sharp cutting edge to the share. The use of this process in turning out ploughshares is now almost universal, both in this country and America. The chief business of the establishment is still the manufacture of agricultural implements and machinery; although the firm is also extensively recognized in conjunction with railway works and improvements. Upwards of three thousand miles of “line” in the United Kingdom, and nearly two thousand more in other parts of the world, are now laid down and maintained on the patent known as Ransome and May's. The success of the house as agricultural implement makers may be tested, in some degree at least, by the high honours taken at the great national meetings of both England and France:—

At the first meeting of the Royal Agricultural Society at Oxford, the society's **GOLD MEDAL**.

At the meeting at Liverpool, a *high commendation* for the introduction of the portable steam-engine in connexion with the thrashing machine.

At the meeting at Bristol, the first prize of £30 for the successful accomplishment of the object of thrashing by a steam locomotive engine.

At the meeting at Derby, the society's **GOLD MEDAL** again awarded them: the only instance in which any exhibitors have received this honour a second time.

The Irish Society has also awarded their Council **GOLD MEDAL**.

The **Grand GOLD MEDAILLE d'Honneur** was awarded them at Paris in 1856, in addition to many smaller **GOLD MEDALS**.

And the **GOLD MEDAL** at the Rouen meeting in the present year.

The following is a more general and chronological list of PRIZES and MEDALS awarded by the great Agricultural Societies to Messrs. Ransomes and Sims, but this must by no means be taken as a complete epitome of their success:—

PRIZES.

Plough	Y.L.	£10, as the best heavy land plough	Royal Agricultural Soc. of England, Southampton
Do.	Y.L.	£10, as the best light land plough	Do. do. do.
Do.	Y.L.	£10	Do. do. Northampton
Do.	Y.L.	Council Medal, as made by Busby	Great Exhibition
Do.	Y.R.C.	The Prize	Royal Agricultural Society of England, Lewes
Do.	Y.R.C.	Do.	Do. do. Lincoln
Do.	Y.R.C.	Do.	Do. do. Carlisle
Do.	Y.R.C.	Divisional Prize	Bath and West of England, Tiverton
Do.	Y.R.C.	The Prize for deep ploughing	Royal Agricultural Society of Ireland, Carlow
Do.	V.R.L.	First Prize for light land	Paris Exhibition, 1856
Do.	V.R.L.	Second Prize for light land	Royal Agricultural Soc. of England, Chelmsford
Do.	V.R.S.	The Prize for deep ploughing	Do. do. Carlisle
Do.	V.R.S.	The Prize for deep ploughing	Bath and West of England, Tiverton
Do.	V.R.S.	First Prize for deep ploughing	Paris Exhibition, 1856
Do.	Y.U.L.	Universal plough	Do. do.
Do.	L.P.	Lowcock's turn-wrest plough	Royal Agricultural Soc. of England, Shrewsbury
Do.	L.P.	Do. do.	Do. do. Exeter
Do.	L.P.	Do. do.	Do. do. Lewes
Do.	L.P.	Do. do.	Do. do. Gloucester
Do.	L.P.	Do. do.	Do. do. Chelmsford
Do.	Beaulecres	Subsoil plough	Do. do. do.
Do.	do.	Do.	Bath and West of England, Tiverton
Trussed Whippetrees.		Commended	Royal Agricultural Soc. of England, Lincoln
Scarifier, Biddell's No. 1		The Prize	Do. do. Liverpool
Do.	do.	Do.	Do. do. Northampton
Do.	do.	Do.	Do. do. York
Do.	do.	Do.	Do. do. Norwich
Do.	do.	Do.	Do. do. Lewes
Do.	do.	Do.	Do. do. Gloucester
Do.	Biddell's No. 7	Do.	Do. do. Chelmsford
East Anglian Harrow.		A Prize, medium size.	Do. do. do.
Field Roller, No. 10		Do. do.	Do. do. do.
Do.	No. 20	Do. do.	Do. do. do.
Do.		The First Prize, £30	Do. do. Bristol, 1842
7 P Portable Steam Engine		A Prize of £10	Do. do. Lincoln
Do.	do.	The Prize	Royal Agricultural Society of England, 1854
Do.	do.	Do.	Do. do. 1855
8 P Fixed Steam Engine		A Prize of £10	Royal Agricultural Society of England, Lewes
Do.	do.	The First Prize of £20	Do. do. Lincoln
Do.	do.	The First Prize of £20	Do. do. Carlisle
Do.	do.	The Second Prize	Paris Exhibition, 1856
Combined Thrashing Machine, No. 1		The First Prize	Do. do.
Rotary Thrashing Machine, No. 2.		The Prize of £10	Royal Agricultural Soc. of England, Carlisle
Four-horse do.		The Prize	Do. do. Gloucester
Two-horse do.		Do.	Do. do. do.
Two-horse do.		Do.	Royal Agricultural Society of Ireland, Killarney
Two-horse do.		The First Prize	Do. do. Carlow
Chaff Engine, No. 2		The Third Prize of 100 francs	Paris Exhibition, 1856
Do.	No. 3	The Prize	Bath and West of England, Tiverton
Turnip Cutter, Single Action		The First Prize	Paris Exhibition, 1856
Do.	Double Action	Do.	Do. do. do.
Horse Works		The Second Prize	Do. do. do.
Winnowing Machine		The First Prize	Do. do. do.
Bruce's Sable Fittings		Bronze Medal and 50 francs	Do. do. do.

MEDALS.

Gold	Superior collection of Implements	Royal Agricultural Soc. of England, Oxford
Do.	Superior workmanship	Do. do. Derby
Silver	Best light land plough	Do. do. Southampton
Do.	Best heavy land plough	Do. do. do.
Do.	Patent whippetrees	Do. do. Derby
Do.	Universal plough	Do. do. Norwich
Do.	Corn and seed depositor	Do. do. do.
Do.	Lowcock's plough	Do. do. Southampton
Do.	Tile machine	Do. do. do.
Do.	Double mill	Do. do. Lewes
Do.	Indian cultivator	Jamaica
Bronze	Drop drill	Great Exhibition
Do.	Printing press	Do.
Do.	Water crane, treenails, &c.	Do.
Silver	Bean cutter	Royal Agricultural Soc. of England, Gloucester
Do.	Do.	Yorkshire Agricultural Society

Silver	Bean cutter	Royal Agricultural Society of Ireland, Killarney
Do.	Two-horse thrashing machine	Do. do. do.
Do.	Horse-power gearing	Do. do. do.
Do.	Subsoil plough	Do. do. do.
Do.	Patent whippetrees	Do. do. do.
Do.	General assortment of implements	Dublin Spring Cattle Show
Do.	Davy's flax machinery	Royal Agricultural Society of England, Lincoln
Council Gold	Steam thrashing machine	Royal Agricultural Society of Ireland, Armagh
Silver	Best plough	Do. do. do.
Do.	Best seed harrows	Do. do. do.
Do.	Best crushing mill	Do. do. do.
Do.	Best 2-horse power thrashing machine	Do. do. do.
Do.	Best portable steam engine	Do. do. do.
Do.	Best set of horse power gear	Do. do. do.
Do.	Best set of whippetrees	Do. do. do.
Medaille d'Honneur	Collection of Implements	Paris Exhibition, 1855
Silver	Cotgreave's plough	Royal Agricultural Society of England, Carlisle
Medaille d'Honneur	Collection of Implements	Paris Exhibition, 1856
Gold	Steam thrashing machine	Do. do. do.
Do.	Plough for light land	Do. do. do.
Do.	Winnowing machine	Do. do. do.
Do.	Double action turnip cutter	Do. do. do.
Do.	Single action turnip cutter	Do. do. do.
Silver	Fixed steam engine	Do. do. do.
Do.	Horse work	Do. do. do.
Do.	Plough for general purposes	Do. do. do.
Do.	Plough for heavy land	Do. do. do.
Do.	Plough Y.U.L.	Do. do. do.
Bronze	Bruce's stable fittings	Do. do. do.
Do.	No. 2 chaff engine	Do. do. do.
Silver	Cotgreave's plough	Royal Agricultural Soc. of England, Chelmsford
Gold	Best collection of implements	Rouen, France.

## PLATE II.

## NAPOLEON THE III.; A HEREFORD BULL.

BRED BY AND THE PROPERTY OF LORD BERWICK, OF CRONKHILL, NEAR SHREWSBURY.

Napoleon III. was bred by, and is still the property of, Lord Berwick; he was calved 30th January, 1853, and is by Walford (871), dam (Duchess of Norfolk) by Tom Thumb (243), g. d. (Pigeon) by Young Trueboy (82), gr. g. d. (Pigeon) by Ashley Moor White bull (791), gr. gr. g. d. (Old Damsel) by Cholstrey (868), gr. gr. g. d. (Old Damsel) by Coleman's Bull (purchased from Mr. T. A. Knight), gr. gr. gr. gr. g. d. (Old Daisy) by Chancellor (156) gr. gr. gr. gr. g. d. (Cherry the Second) by Mr. Knight's Bull, winner of the Hereford Cup in 1807, gr. gr. gr. gr. g. d. (Cherry the First) bred by Mr Knight.

Napoleon III. is one of the most compactly formed Herefords ever seen. He is not long in frame, but amazingly deep; his chest, and all along his underneath parts, exceedingly good; his flank very full, deep, and low; his chine and girth great and good; but back, perhaps, a little amiss. His hips are of fair width, and good; his legs short, which perhaps causes him to look less noble than his general proportions would indicate. The quality of his flesh and softness of skin are excellent.

At the Royal Agricultural Society of England's Meeting at Lincoln, 1854, he was highly commended.

At the Paris Exhibition, June, 1855, he was awarded a Bronze Medal with *mention très honorable*, not being eligible for a prize. His sire, Walford, also the property of Lord Berwick, took the first prize of £40 for Hereford bulls at the same Meeting.

At the Royal Agricultural Society of England's Meeting at Chelmsford, July, 1856, he was awarded the first prize of £30 for Hereford bulls under four years old.

The above bull's dam took first prizes at the Royal Agricultural Society's Meetings for three successive years, as a yearling, two-year-old in calf, and cow in milk: at Norwich, Exeter, and Windsor. Her first calf also took prizes at the same Society's Meetings for three successive years, as yearling, two-year-old in calf, and cow in milk. Napoleon III. is the second calf of his dam.

## THE DUNG OF BIRDS.

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

At this period of the well-established use of guano, it is needless to attempt to prove the value of the excreta of fish-fed birds. The importation of 235,111 tons of Peruvian guano in 1854, and of 305,061 tons in the year 1855, renders it unnecessary to prove the value of the dung of birds to the English farmer. Its present price, too (£11 per ton), tells the same truth, that the importance of this manure is no longer a question. The value of the manure from our domestic poultry is less known, because of the limited amount obtainable. But then a useful inquiry arises as to the advantages which might be derived from increasing our stock of poultry, and by collecting and keeping their dung under cover, so as to increase the amount collected, and the power of the manure. It is to be remembered that there are two or three conditions to be fulfilled in entering upon such an effort to prepare British guano; the food of the birds should contain a large proportion of animal matters; the dung should be protected from rain (not mixed with any earthy matters), and to render it worthy of the labour of collecting, should be produced in considerable quantities. It is an incorrect conclusion that the dung improves in value by keeping; the opposite result is, in fact, obtained; the ammonia most probably diminishes in amount by age. The Peruvian farmers much prefer the recent droppings of the sea-birds of the guano islands to that which has lost its white colour by age; and this, let us remember, is a result obtained in a climate dry and warm, where rain is an unknown phenomenon.

The difficulty of collecting it in England, in any considerable quantity, is the great objection; and as this stands as it were at the very threshold of our inquiry, let us take a glance at what they are doing in foreign poultry yards, and ask ourselves whether we might not, in certain favourable situations, keep poultry to a much more profitable extent than at present. It is certain that in the warm climate of Egypt, ducks, and in China other poultry, are hatched by artificial means in large and remunerative flocks; the dung of these must be of considerable value. The pigeons' dung has even been imported into this country from Egypt; and in Holland the dung from dove-cotes is of well-known value. But we may omit from our consideration the last-named poultry, since there are, perhaps, few situations in this country

where the food of pigeons is not of more value than the birds: let us, rather, confine ourselves to the ordinary poultry of the farm-yard. In this branch of our rural economy, we are, perhaps, much excelled by our continental neighbours. In the last number of the *Quarterly Journal of Agriculture*, Mr. P. L. Simmonds, when referring to the rearing of poultry in France, has alluded to more than one fact bearing upon the subject of this paper. He observes (p. 486), that besides lime or powdered oyster shells, sand or ashes, and a copious supply of water, domestic fowls require a large amount of animal food to make them prolific layers. To this great attention is paid in France. M. de Sora, a large fowl-breeder in the neighbourhood of Paris, is reported to buy the used-up hacks of the French metropolis for feeding his hens, and he thus obtains eggs every day in the year. M. de Sora's poultry-yards furnish about 40,000 dozen of eggs a-week, which he sells at the rate of six dozen for three shillings and fourpence, thus yielding to their proprietor a very handsome revenue. He employs about a hundred persons, mostly females. He never allows a hen to sit, all his chickens being hatched by steam. The eggs are arranged upon shelves, and covered with blankets, and each morning a swarm of chickens are taken to the nursery. The Chinese, too, have large establishments at Shanghai for the hatching of poultry by artificial heat. The process adopted is a simple but efficacious one, and the heat employed is seldom more than 93 degrees. At the principal establishment, the proprietor affirmed to Mr. Sirr that he frequently hatches 5,000 eggs per day. In England and America, however, hatching machines have not been found to succeed in practical operations.

In any case it is useless to anticipate success from such large rural operations without the greatest care and attention. The number of hens which are necessary to produce M. de Sora nearly half a million of eggs per week must be enormous; the food consumed, and the amount of dung produced, must be proportionately large, and, from the large proportion of animal food consumed, of a highly nitrogenous quality. That the French have found out a way of profitably keeping poultry in confined spaces, and upon purchased food, is pretty evident to every one who has travelled in France. For, although on the one hand eggs and poultry are found in profusion on every table, and are bought

at a much lower rate than with us, yet it is every person's remark that neither on the roads, nor about the cottages or little farm homesteads, is any amount of poultry to be seen. We have in this country, in the case of the Aylesbury ducks, an instance of the profitable management of poultry on a large scale. Mr. Read, in his prize report upon the farming of Buckinghamshire (*Jour. Roy. Ag. Soc.*, vol. xvi., p. 301), tells us that when these are highly fed, they begin to lay about Christmas; and as all the eggs are hatched under hens, the old ducks, not being permitted to sit, continue laying during the season. The ducklings are taken from their foster-mother the moment they leave the shell, are kept in lots, warmly housed, and allowed but a limited access to water. They are fed, in addition to corn, with greaves, liver, flesh, and almost every description of animal garbage. In eight or ten weeks the ducks are killed and forwarded to London, where, in the early season, prices sometimes range as high as 14s. per couple. Of the numbers thus produced (adds Mr. Read) it is impossible to speak with certainty; but to illustrate the quantity, it may be stated that a little farmer at Bierton had at one time last season nearly 2,000. He calculates that about 400,000 are annually reared in Buckinghamshire.

The dung of poultry has been examined by Girardin. He found it to be composed of:—

Water .....	16.13
Organic matter .....	3.74
Ash .....	2.53

Some analyses made long since by M. Vauquelin, which have never been repeated, would lead to the rather curious conclusion that phosphorus is formed in the bodies of fowls during the process of digestion. He found that a hen devoured in ten days 11,111,843 grains of oats; these contained 126,509 grains of phosphate of lime. During these ten days, she laid four eggs, the shells of which contained 98,779 grains of phosphate of lime. The excrements emitted during these ten days contained 175,529 grains of phosphate of lime, consequently, although she took in only 126,509 grains of phosphate of lime, she gave out 274,308 grains of this salt. The experiment, however, is open to several sources of uncertainty (*Thomson*, vol. vi., p. 357).

I have already referred to the imported pigeons' dung of Egypt; this was analyzed by the late Professor Johnston, and I will (after giving the results he obtained) add the comparative trials with pigeons' dung and with hen dung as a manure for carrots and turnips, by an eminent Scotch farmer, and this in the words which I have elsewhere employed.

The Professor reported (*Trans. High. Soc.*, 1847, p. 580), that when the Egyptian pigeons' dung was subject to analysis, it was found to consist of 23.9 per cent. of soluble and 76.1 per cent. of insoluble matter. Its more detailed composition was, per cent.:—

Water .....	6.65
Organic matter, containing 3.27 per cent. of nitrogen, equal to 3.96 of ammonia .....	59.68
Ammonia .....	1.50
Alkaline salts .....	0.42
Phosphates of lime and magnesia .....	7.96
Carbonate of lime .....	2.37
Insoluble silicious matter .....	21.42

"It will be seen," he adds, "that the sample submitted to examination contained upwards of one-fifth of its weight of sand or mixture, scarcely, perhaps, to be avoided in a country like Egypt. As a manure it will be very valuable to the farmer, and if more free from sand, may prove even a profitable article of commerce. It is as rich in ammonia and ammoniacal matter as some of the best Ichaboe guanos. It is only half as rich, however, in bone earth; but this deficiency, if considered of importance in any particular locality, might be made up by an admixture of bone-dust, or of the waste bone charcoal of the sugar refiners." While this indefatigable chemist was thus examining the chemical composition of the newly-arrived fertilizer, a Scotch farmer was as busily and as usefully employed in testing the value of the same manure on his fields of carrots and of turnips. His trials, without rivalling those of the analytical chemist in minute accuracy, were tried on a bolder scale, and in Nature's own great laboratory, amid the sunny slopes and the wholesome breezes of Whitehill, in Mid-Lothian. "The object of these experiments," remarks Mr. A. J. Main (*ibid.*, vol. for 1849, p. 503), "was to ascertain the relative value of hens' and pigeons' dung as compared with Peruvian guano. The pigeons' dung which I employed was in excellent order, and with very little extraneous matter in it; but I cannot say so much for the hens' dung. In the process of collection it had been mixed with straw and chaff to a large extent, and during winter had not been kept sufficiently dry, so that its quality must have been greatly deteriorated. Another object was to ascertain the value to vegetation of dung alone, and dung with specific manures. The field on which the following experiments with carrots was made, contains about nine imperial acres; it consists of a light sandy loam, with a subsoil of the most part of a sand and gravel. In some parts the sand is pure, in others the subsoil is of moss, which is chiefly found in a basin at the north-west portion of the

field. With the exception of the mossy subsoil, all the rest of the field is perfectly dry. The inclination of the field is from north-east to south-west. The field is sheltered on three sides by plantations, and the carrots were sown on a flat portion towards the south-east boundary. The field was ploughed from old lea, in 1844, and a crop of oats taken in 1845; turnips manured with home dung, guano, &c., in 1846; again oats in 1847, turnips and carrots. The manure applied this year was home dung and various special manures. I first ploughed in the home manure, and previous to harrowing, I had the special manures sown broad-cast and harrowed in. The seed was then sown in ruts 14 inches apart, formed with the head of a large rake, and trodden in. The manures were applied on the 23rd, and the seed sown on the 24th of April. The results of the various applications per acre were as follows:—

Manure.	Produce of carrots.		
	tons.	cwt.	lbs.
Home manure 24 tons....	12	13	54
Home manure 16 tons, pigeons' dung 4 cwt. ...	14	5	60
Home manure 16 tons, Peruvian guano 4 cwt. ....	13	16	48
Home manure 16 tons, hen dung 4 cwt. ....	11	12	96

With white globe turnips the following results were obtained per acre:—

Manure.	Bulbs.		Shaws.	
	tons.	cwt.	tons.	cwt.
Home manure, 28 tons produced	14	12	6	14
Police manure, 40 yards .....	14	18	6	18
„ 28 yards } .....	13	8	8	1
Hen dung, 4 cwt.				

Of the value, then, of the dung of our domestic birds, there appears to be no doubt; its composition is, in a great degree, similar to that of guano, and let us not forget that if poultry were fed with a larger proportion of animal food than at present, the dung would more closely resemble that of the fish-fed birds of the guano islands.

It may be true that it is not in every situation that large quantities of poultry could be profitably kept in England, but I feel assured that there are many places where large poultry establishments might be advantageously maintained in connection with the farm-yard. It is true that the poultry of France have a higher mean temperature and a drier climate in their favour than with us; but then we have cheaper fuel to warm our houses, larger supplies of refuse fish, flesh, and garbage than in France, and an equally large demand for eggs for domestic and manufacturing purposes, and far higher prices both for eggs and poultry than those which rule in the markets of Paris. Something, perhaps, will then be done one day or other in keeping poultry in England on a much larger

scale than any which has hitherto been attempted. The demand for poultry in common with that of other animal food will probably long continue to advance; this will lead to increased efforts, to more business-like arrangements in poultry keeping; the supply of the manure from them will become, from its increased amount, more worthy of the agriculturist's notice. But these things may yet require years to accomplish. The history of the tardy introduction of guano into England, leads us not to be sanguine as to the use of the dung of the birds of our country. It was generally known in our country that guano had for ages been employed by the Peruvian farmers. Sir H. Davy, the earliest of our agricultural chemists, in alluding to the masses of it which abound on the Chincha Islands, suggested, in the year 1810, its use as a manure, yet thirty years elapsed before (in 1840) it was first imported, in about 20 casks, into Liverpool. So from very early ages we find notices of the value of the dung of poultry (2 *Kings* vi. 25). M. P. Cato, the earliest of the writers upon agriculture (*lib.* 86), commends the use of pigeons' dung for meadows, corn lands, or gardens; and in England, John Worlidge, in 1669, was warm in the praise of the dung of fowls. "Pigeons' or hens' dung," he says (*Mysteries of Agric.*, 71), "is incomparable; one load is worth ten loads of other dung, and is, therefore, usually sown on wheat or barley that lieth far off, and is not easily to be helped." And he adds in another place: "A flock of wild geese had pitched upon a parcel of green wheat, and had eaten it up clean, and sat thereon and dunged it for several nights, that the owner despaired of having any crop that year; but the contrary happened, for he had a far richer stock of wheat there than any of his neighbours had."

These facts are worthy of our careful attention, since time—and not, perhaps, a very long time—will exhaust even the Peruvian islands of their guano; and if so, after having experienced its value, the English farmers will hardly part with it without securing a successor: they will not again be wanting in their efforts to keep pace with the demands of an increasing and a far better fed population than any that has before tenanted our islands.

NECESSITY OF A SCIENTIFIC AS WELL AS A MECHANICAL KNOWLEDGE OF AGRICULTURE.—Their whole attention appeared to be entirely absorbed in the mechanical, such as hedging, ditching, ploughing, sowing, &c., never once dreaming about the scientific part of the business, but expecting at the same time their crops to spring forth spontaneously. Most of them were growers of wheat, and they ought to know of what substances it was composed—the wheat must be the produce of the soil, and if the soil did not contain the substances necessary for its production, it was im-

possible for them to obtain a perfect crop; but if attention be paid to the analysis of soils, a crop might then be depended upon with greater certainty—As a doctor, he might say, by way of illustrating the subject, that any of them might take a dose of physic which probably would do them good, but if they took a double dose the effects might be serious; so with regard to soil, if they gave more or less than it required, disappointment would be the result. Last year he saw many of his friends buying quantities of artificial manures, at a cost of £12 per ton. He

took portions of these manures, which upon analysis proved to be worth not more than £5 per ton. These facts did not seem to remove their scepticism; and although he might be thought rather offensive, he could not help characterising such conduct as being immeasurably stupid, as they might have their manures analyzed at a trifling cost. In conclusion, he recommended a little more attention to science, which would be attended with beneficial and satisfactory results.—MR. WOOD at the Quornden Agricultural Society.

## THE SMITHFIELD SHOW WEEK.

Of the influence of such societies as the Royal Agricultural and the Smithfield Club we could need no better proof than this year's show of stock in the Baker-street Bazaar. To use a favourite phrase of the agricultural connoisseur, it was a remarkably "even" one—remarkable, that is to say, for the general excellence of the animals entered. There was not a bad beast in the yard. Turn to what class you would, and nearly all were found developing the best points of the breed in the highest degree. It was, indeed, often a nice question as to which was first or second, or what merely commended. The judges reversed some of the Birmingham decisions, and they did so with but little comment or complaint. So trifling was the actual difference in many instances, that a third set of men might likely enough have picked out a third ox as the best of his entry. The Smithfield Club may be spoken of as a good butcher's market, or an agreeable lounge for the sight-seers of the metropolis; but it is something far more. The annual exhibitions here have taught the breeders and feeders of the whole kingdom to understand what a good animal really is, or should be. And so, instead of the curiosities which stood out in such strong comparison but a few years since, we have now arrived at an "even show." Men know better by this than to send up stock that have not a chance. They carry away with them in their mind's eye the contour of Mr. Heath's Devon or Mr. Stratton's shorthorns, and they inwardly ask of themselves whether they have anything that ought to be up here? These shilling lessons at Mr. Boulnois' academy are wonderfully instructive.

As we anticipated, the week went well. In fact, we seldom remember one where things passed off more pleasantly, or with a better promise for the future. The Club was strongly supported by both the exhibitors and the public. Tolerably conclusive evidence, if any were wanting, as to the attendance of the latter, is to be found in the facts, that by mid-day on Friday not a catalogue was to be had for love or money, and that the contractor has "sprung" another two hundred on his rent of the Show. The effect of this will tell all ways. The Club is enabled to considerably increase its usefulness in the way of additional premiums; and the only doubt is, whether by the end of the five years' agreement the Bazaar will be able to afford sufficient room and accommodation for a meeting, which is very rapidly enlarging its objects and attractions.

On the three first days of the exhibition the throng of town and country visitors was perhaps greater than ever. The implement galleries were at times impassable, and the gold medal animals as often invisible. It was only after a struggle that you got a peep at the short-horn cow, or with commendable patience edged your way up to the Duke's Downs, or Mr. Walmsley's wonderful pen of Leicesters. If any of the exhibitors did stand out prominently before their fellows, it was in the sheep classes. These gold medal Leicesters were pronounced by good judges to be about the best ever shown; while the Duke of Richmond has never surpassed the strength of his present flock. As specimens of pure-bred sheep of either sort, these two pens deservedly stand as models of their kind. In the stock classes, on the contrary, there was nothing, as we have already intimated, very pre-eminent. The most perfect animal in the yard was, perhaps, Mr. Stratton's shorthorned cow. We would, however, refer to an article especially devoted to this subject, in its proper place, as an appropriate introduction to the prize list.

We have already intimated that the meetings of the week were full of further promise. The Smithfield Club itself, as will be seen from the report of what occurred, has made a very striking advance and improvement. Every breed of stock worthy of a distinctive classification will now have it. The routine monotony of the dinner has been thoroughly reformed; Mr. Brandreth Gibbs is about to make us a most suitable new year's offering in a history of the Club; the privileges of membership are gradually extending; and the members generally obtaining more voice at their own meetings. "The privacy of the snug little family party has been broken in upon." What the Club has chiefly to fear is this kind of snug privacy; and he is the best friend to the Society who boldly denounces it. There is a little further enlargement still required in the appointment of stewards. We are told there is nothing more difficult than the selection of judges; so few, comparatively, are known to be competent. Now, we must maintain that the best apprenticeship for a judge of stock would be to enter him, in the first place, as a steward. Besides, the more fresh men you can get to take a direct interest in the proceedings, the more new members are you likely to enrol. With every respect for gentlemen who have served the office, we say



it would be better for the Club not to fall back upon them. It is not necessary, and it is not politic.

The Royal Agricultural Society, again, is moving. The prize list here, too, has just been amended. The premiums for thorough-bred hunter stallions and hunting mares are at length to come immediately from the Society, instead of by a side-wind from any one who was charitable enough to offer them. Then the general annual meeting in the Smithfield show week has a chance of actually becoming what it at present merely professes to be. At this general annual meeting on the Saturday in the week there were present, in addition to a strong array of reporters, some fourteen or fifteen members! The business, of course, was of the most pro forma character. The only noticeable feature, in fact, was a proposition from Mr. Corbet that this meeting be brought forward to some earlier day in the week, when the members will have a better opportunity of attending. The suggestion was at once endorsed by Mr. Fisher Hobbs, in a very business-like speech, and there is no doubt but that it will be adopted.

The reports of the discussion-meeting at the Farmers' Club, of the dinner of the same Society, and of that of

the Smithfield Club, will all speak for themselves. These two dinners were both well attended and well served. The post-prandial oratory at either, however, was hardly equal to what we have heard. At the Freemasons', Miss Wells and "Bonnie Dundee" appeared to have by far the best of it. The Farmers' Club discussion, on the contrary, was very ably maintained. It is seldom we have known one of a more practical or useful character. The point of it is, that the less you interfere with or hamper the farmer, the better for everybody concerned.

The Society of Arts, as usual, adapted one of its subjects to the occasion—though rather a stale one by this time—the utilization or value of town sewage. The few agriculturists present appeared to take but little interest in the matter, and not one of them spoke to it. The meeting was chiefly remarkable for some rather sharp cross-firing and amusing personalities; but it does not appear to have done much towards elucidating the difficulties surrounding the question of use and application. We have no room for any report of what was said; and, indeed, we have some doubt whether so old a story is worth transplanting at all.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held on Wednesday, the 3rd of December. The following Members of Council and Governors of the Society were present: Mr. EVELYN DENISON, M.P., President, in the chair; Sir John Villiers Shelley, Bart., M.P.; Sir Archibald Keppel Macdonald, Bart.; Mr. Dyke Acland; Mr. Alcock, M.P.; Mr. Raymond Barker; Mr. Bramston, M.P.; Mr. Cavendish; Colonel Challoner; Mr. Brandreth Gibbs; Mr. Fisher Hobbs; Mr. Milward; Mr. Allen Rausome; Mr. Sillifant; Mr. Thompson; and Mr. Bureh Western.

The following new members were elected:—

Ackroyd, William, Oley, Yorkshire  
 Allaby, George, Wallington, Louth, Lincolnshire  
 Baker, Thomas, Stapleford, Cambridge  
 Barnett, R., Mopall Court, Grave-sead, Kent  
 Barroby, Mark, Disforth, Thirsk, Yorkshire  
 Borraddell, J. B., Great Bentley, Colchester, Essex  
 Brown, James, Brynglas, Newport, Monmouthshire  
 Buddcomb, William B., Penbed Hall, Mold, Flintshire  
 Bunsen, George, Burgh-Rainford, Bonn, Prussia  
 Calvert, John Simpson, Torsil, Alford, Lincolnshire  
 Cartwright, John, Craycombe House, Pershore, Worcestershire  
 Conzeve, S. B., Harbors-magna, Rugby, Warwickshire  
 Curtis, Harry, Hill Farm, Fordingbridge, Hampshire  
 De Winton, Captain Thomas, Walsworth Hall, Gloucester  
 Dell, Robert, Aylesbury, Buckinghamshire  
 Dilke, C. Wentworth, jun., 76, Sloane Street, London  
 Eitelsten, Peter, The Woodlands, Moseley, Birmingham  
 Ems, James, M. D., Sudbrooke Park, Petersham, Hampshire  
 Elston, William Alfred, Bugbrook, Northampton  
 Estou, Captain W., St. Anne's Road, Brixton, Surrey  
 Forrester, The Baron de, 24, Crutched Friars, London  
 Fowler, Charles, Whitelands, Bicester, Oxon  
 Graham, Walter, West-Drayton, Uxbridge, Middlesex  
 Grantham, George, Barcombe Place, Lewes, Sussex  
 Hall, Marshal, jun., Pensile House, Nailsworth  
 Hare, Captain Humphrey John, Bramhope Hall, Oley  
 Hughes, Hugh, Woodgate, Danehill, Uckfield, Sussex  
 Hurle, Joseph Cooke, Brislington, Bath

Jouas, John Carter, 25, Gresham Street, London  
 Jones, George, Mitton Manor House, Penbridge, Staffordshire  
 Maclean, Charles, Fan Grove, Chertsey, Surrey  
 Mausel, Morton, Punchole, Dorchester, Dorset  
 Morton, John Lockhart, 26, Parliament Street, London  
 Mott, Thomas, Much-Haddam, Ware, Hertfordshire  
 Owen, John Gwynne Herbert, Newport, Monmouthshire  
 Penethorne, John, Hamstead House, Yarmouth, I. of W.  
 Pope, Thomas, Horningham, Warmminster, Wilts  
 Rayment, William, Furneaux-Pelham, Ware  
 Robinson, Joseph, Clifton Pastures, Newport Pagnel, Bucks  
 Royds, Rev. John, Heysham Rectory, Lancaster  
 Stemming, Edward, Stratton House, Godstone, Surrey  
 Sworder, Henry, Hallingbury Hall, Bishop's-Stortford  
 Sworder, William, Tawney Hall, Epping, Essex  
 Sworder, John, West Mill, Bury, Buntingford, Hertfordshire  
 Thompson, William, jun., Thorpe-Soken, Colchester, Essex  
 Traherne, George M., St. Hilary, Glamorganshire  
 Tuckett, Philip Deball, jun., Frenchay, Bristol.

FINANCES AND HOUSE.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the monthly report of the accounts of the Society; from which it appeared that the current cash balance in the hands of the bankers on the last day of the month just ended was £650. Mr. Barker, as Chairman, also read the report of the House Committee. These reports were adopted.

PRIZES FOR ESSAYS.—Mr. Thompson, Chairman of the Journal Committee, reported the following awards:

- I. TO PETER LOVE, of Naseby Manor Farm, Northamptonshire: the Prize of £20, for the best Essay on the different mechanical modes of deepening the staple soil, in order to give it the full benefit of atmospheric influence.
- II. TO T. W. P. ISAAC, of Terrace Walks, Bath (Land-Surveyor): the Prize of £20, for the best Essay and Plans for the construction of Labourers' Cottages, with special reference to domestic convenience.

VETERINARY LECTURES.—Mr. Raymond Barker and Mr. Thompson, as the Chairmen respectively of

the Finance and Journal Committees, brought up a joint-report, which was referred to the Monthly Council in February.

**SALISBURY MEETING.**—Mr. Cavendish, Vice-Chairman of the General Salisbury Committee, reported the recommendation that the Country Meeting of next year should be held in the week commencing Monday, the 20th of July. This recommendation was adopted by the Council.

**PRIZES FOR IMPLEMENTS AND STOCK.**—On the motion of Mr. Fisher Hobbs, the preliminary arrangement of the Country Meeting Prize Sheets for next year was referred to the Implement Committee, and a Special Live-Stock Committee then named, with a request that they would report their recommendations to the Special Council of Thursday, the 11th of December.

**STEAM-PLOUGHING.**—The Council received from the Stewards the Judges' report of the trial of Mr. Fowler's plan of ploughing by steam-power. The President directed a Special Council to be summoned for the ensuing week, when their report on the trial of machinery competing for the Society's prize of £500 "for the steam-cultivator that shall in the most efficient manner turn over the soil, and be an economical substitute for the plough or the spade," may be taken into deliberate consideration.

**DECEASE.**—Notice was given that the vacancy in the Council, occasioned by the lamented decease of Mr. Woodward, would be filled up by election at the monthly meeting in February.

**COMMUNICATIONS** were received from Mr. Pain, Mayor of Salisbury, on the subject of Prizes for Hampshire Down Sheep; from the Board of Agriculture of Lower Canada, on the establishment of an Agricultural Society; from the Smithsonian Institute of America, a present of books; from the Agricultural Society of the Duchy of Nassau, on the entering into communication; from the Baron de Forrester, a valuable collection of his works relating to the capabilities of the soil and climate of Portugal; from Mr. Knowles, a copy of his Pocket Herd-book; and from Mr. Brown, a copy of his Farm-Account Book: along with various other presentation-copies of works connected with agriculture, for which the Council ordered their usual acknowledgments.

The Council adjourned to their weekly meeting at 12 o'clock on Wednesday, the 10th of December, open to all Members of the Society.

The Half-yearly Meeting of this Society was held on Saturday, Dec. 13, in Hanover-square. In the absence of the President, Lord Portman, the Chair was taken by Mr. R. Barker. Among those present were: Mr. R. Etwell, Mr. R. Tull, Mr. W. F. Hobbs, Mr. Samuel Druce, M. Trehonnais, Professor Simonds, Mr. Burness, Mr. Astbury, Mr. Corbet, Mr. Warry, Mr. J. Gray, Mr. Grove, &c.

The **CHAIRMAN**, in opening the proceedings, briefly adverted to the unavoidable absence of the President, and observed that, as one of the Vice-presidents of the Society, it was his duty to supply the noble lord's place.

The Secretary, Mr. Hudson, then read the following report of the Council:—

**REPORT.**

The Society consists at the present time of

- 85 Life-Governors,
- 137 Annual Governors,
- 892 Life-Members,
- 3,917 Annual Members, and
- 19 Honorary Members:

making a total of 5,020 Members, or an increase of 41 names on the list of the Society since the last half-yearly meeting.

The Council have elected the Earl of Powis and Mr. Edward Pope to supply the vacancies respectively occasioned in the Council by the transfer of Mr. Evelyn Denison, M.P., to the class of Trustees, and the lamented decease of Mr. Hampden Turner.

The Funded Capital of the Society stands at the same amount as reported at the last general meeting, namely, at £9,264 8s. 11d. in the New Three per Cent. Consolidated stock.

The following Prize-Schedule for the Essays and Reports of next year, to be sent to the Secretary by the 1st of March, and to be subject to the usual conditions of competition, has been adopted:—

	£
1. The results of microscopical observation applied to the vegetable physiology of agriculture . . . . .	50
2. The best mode of levelling ridge and furrow pasture land after drainage . . . . .	20
3. The permanent amelioration of soils by admixture with others . . . . .	20
4. Destruction of vermin infesting the homestead and stackyard . . . . .	10
5. The comparative advantages of entering upon farms in spring and autumn, together with instructions to the young farmer on his entry at either season . . . . .	20
6. The results of drilling wheat or barley at different distances with the same quantities of seed; and also with varied quantities of seed per acre . . . . .	10
7. Any other agricultural subject . . . . .	10
8. On the comparative advantages of sowing beans in spring and autumn . . . . .	10
9. On the early or late sowing of root crops . . . . .	10

Professor Way, the Consulting Chemist to the Society, has delivered to the Members a second time his lecture on the chemical composition of the waters of land-drainage, for the purpose of detailing the further progress of his researches on that subject; and the Council have adopted a new scale of charges to be made to those Members of the Society that may avail themselves of their privilege of consulting him, or obtaining from his laboratory chemical analyses, at reduced rates. Professor Simonds, the Veterinary Inspector of the Society, has delivered the concluding portion of his lecture on destructive parasites attacking the internal organs of the body in the case of different domesticated animals.

The Country Meeting at Chelmsford has proved eminently successful in carrying out the objects of the Society, although the expenses incurred have entailed a heavy charge on its general funds. The interest attached to the exhibition of live stock, on that occasion, was increased by the great number of horses shown for the Local Committee's Special Prizes, and the select Specimens of Foreign Stock sent over to the meeting

at great expense by the French Government, as a token of their friendly regard towards the Society and its national objects. The implements gave evidence of distinct improvement in their simplicity and efficiency; and the trials in the field, as well as the public working of machinery in the show-yard, were witnessed with deep interest by a numerous concourse of spectators. The reaping-machines and steam-cultivators were reserved for subsequent trial; and the Council have voted to Mr. Fisher Hobbs their best acknowledgments of the kind manner in which he offered his land for the purposes of that trial, which took place in August last; for the liberality in which he placed men and horses at the disposal of the Stewards and Judges for working the machinery; and for the facilities he so readily afforded for rendering the trial satisfactory to all parties. The Judges have made a special report to the Council on the trials made by them on the steam-tillage apparatus respectively of Mr. Smith and Mr. Fowler, competing for the Society's undivided prize of £500 for the steam-cultivator that should in the most efficient manner turn-over the soil and be an economical substitute for the plough or the spade. This report will be published for the information of the members in the ensuing part of the Journal; in the meantime, the Council have the satisfaction of stating, that although the conditions included in the terms of the prize have not been fulfilled by either of these inventions, Mr. Fowler has made considerable progress, by his application of steam-power to the operation of ploughing, towards the probable attainment eventually of the great object of a more economical tillage of the soil. The Council, in carrying out the arrangement for the Chelmsford Meeting, received the cordial and efficient co-operation of the Local Committee; and on that occasion, as on so many former ones, the Society were essentially under obligation to the different Railway Companies of the kingdom for the liberality of their concessions to the exhibitors, and the facilities they afforded in the transit of live-stock and implements to and from the Meeting.

The Country Meeting of next year will be held in the week commencing Monday, the 20th of July; and the authorities of Salisbury have already placed the land for the trial of implements under a due course of preparation. The Council have decided upon the following schedules of the Prizes to be offered by the Society for Implements and Live Stock at that meeting, subject to such terms and conditions of competition as the Council at their February Meeting may think it necessary to adopt.

I. IMPLEMENTS.

	£
Class of Drills .....	30
" Manure Distributors (liquid or other) .....	20
" Horse-hoes .....	10
" Hay Machines .....	10
" Reaping Machines .....	20
" Mowing Machines .....	20
" Har. or rakes .....	10
" Carts .....	10
" Waggon .....	10
" Carts of special construction, with specifications .....	15
Steam Cultivator .....	500

£55

II. LIVE STOCK.

Shorthorned Cattle .....	£ 170
Hereford Cattle .....	170
Devon Cattle .....	170
Channel Islands' Cattle .....	30
Cattle of other established breeds .....	45
Agricultural Horses .....	130
Dray Horses .....	40
Thoroughbred, Hunting, and Hackney Horses .....	105
Leicester Sheep .....	110
Long-wooled Sheep (not Leicesters) .....	110
Southdown Sheep .....	110
Short-wooled Sheep (not Southdowns) .....	110
Figs .....	75
Farm Poultry .....	125

£1,500

The Council continue to be favoured by the Earl of Clarendon with successive reports received at the Foreign Office from countries abroad, in reference to the occurrence of manuring matter in different parts of the world, and to the progress of disease among cattle.

The vigorous prosecution of agricultural research in every department of husbandry, and the more definite application of scientific reasoning to the elucidation of every branch of practical detail, as well as to the gradual establishment of general principles, are circumstances which constitute at the present day a still greater necessity for that division of labour which the local societies throughout the kingdom on the one hand are so competent to execute, and that unity of action on the other which can only be given by a great central body like the Royal Agricultural Society of England, which is at once the representative of the individual interests of the farming community, and the ready means by which their united energies may be most effectively brought into action for the purpose of gaining any given practical object. The increase of its members, and the estimation in which its labours are held, afford strong grounds of hope to the Council that its usefulness may continue unimpaired, and its advantages become more widely distributed by a still further co-operation of the farmers of the country in the promotion of its national objects.

By order of the Council,

JAMES HUDSON, Secretary.

The CHAIRMAN said: He was happy to be able to state that within the last forty-eight hours a very important communication had been received by Mr. Hudson, the Secretary of the Society, from the Foreign Office, and one which he had no doubt the meeting would be glad to hear read. It was a letter just received by Lord Clarendon from the British Consul at Pernambuco, and related to some discoveries which had been made in consequence of the directions issued by Lord Clarendon to our Consuls in South America for the prosecution of researches having for their object the finding additional manures available for agricultural purposes. It was as follows:—

Consulate of Pernambuco,  
Pernambuco, 13th Nov., 1856.

MY LORD,—I have much satisfaction in informing your lordship that, having prosecuted my researches according to

your instructions of the 14th May, 1855, I have at length succeeded in discovering the existence of nitrates in large quantities within this empire.

The gentleman who has assisted me in this service writes to inform me that he has traversed the mountains north-west of Ipu for sixty miles, and finds that the stratum of carbonate of soda extends the whole distance, and in any quantities. Your lordship will remember that I have already sent specimens of this mineral, which Professor Way analyzed, and the President of the Agricultural Society pronounced to be of immense importance to commerce.

To the west of Ipu he discovered the nitrates, of which I transmit specimens, and also of the earth in which they were found. The formation has extended as far as Mr. Lowden's search, which is about fifteen or twenty miles. Alum, of which I also forward specimens, abounds in the neighbourhood. Gold is very abundant, both in quartz and in the streams, particularly the Luré. I forward a small sample.

From Lapa to St. Antonio the ground is covered with hematite or red iron ore; and the mountain range of Icao appears to be composed of it: I forward specimens, and some pyrites which appear full of metal.

I will forward your lordship a small map of the country by the next opportunity, with some suggestions respecting the formation of a port at Canoci, for the export of these various productions. And as I naturally feel the liveliest interest in this wonderful region, the metallic riches of which I discovered, perhaps your lordship would permit me personally to continue its survey, as it altogether lies within the district of my consulate.—I have the honour to be, &c.,

(Signed) H. AUGUSTUS COWPER.

The Chairman thought that this important letter called for some suitable acknowledgment (Hear, hear). The Council had received from time to time many valuable communications from Lord Clarendon, and had conveyed to him their thanks through the President of the day; but there had been no opportunity so favourable as the present one, of recording an expression of gratitude on the part of the Society at large, and he hoped that some one in the meeting would move that their grateful thanks be tendered to his Lordship for the kindness with which he had forwarded their views on this subject, and for the facilities which he had afforded for obtaining the information required.

M. TREHONNAIS said he felt great pleasure in moving a vote of thanks to Lord Clarendon for the valuable communication which had just been read (cheers). It would be quite superfluous for him to enlarge on the subject. The letter had a most important bearing on the question of the future supply of manures, and therefore on the interests of agriculture. The discovery of guano, and other substances which were found in the mineral kingdom, had proved of the utmost importance to the cultivators of the soil; but however plentiful the supply of such manures might be at present, a time must come when that supply would fail, and therefore they must look to other quarters for substitutes. It was impossible to overlook a question which had such an important relation to the present system of husbandry.

Mr. W. F. HOBBS said he felt great pleasure in seconding the motion. As a member of the Council he was well aware of the desire which had been constantly manifested by Lord Clarendon to assist that Society, and, through it, the agricultural body in general. He knew that they had not usually had the support from the Government to the same extent that was formerly

conceded to the old Board of Agriculture; but it was gratifying to find that the Government were always ready to give their assistance by communicating with our Consuls abroad, and inducing them to endeavour to carry out the object in view.

The motion was then put, and carried unanimously.

The CHAIRMAN, as the head of the Finance Committee, then read the following statement of accounts for the half-year:—

“The receipts for the half-year, including the balance of £884 in the bankers' hands at the end of the previous half-year, amounted to £6,802; the principal items being, dividends on stock, £129 14s. 1d.; governors' life compositions, £90; governors' annual subscriptions, £460; members' life compositions, £420; members' annual subscriptions, £3,364 8s.; Journal receipts, £210 8s.; country meeting at Chelmsford, £1,200. The payments during the same period comprised, *inter alia*, establishment charges, £545 3s. 3d.; Journal payments, £651 8s. 5d.; veterinary grant, £100; chemical grant, £150; chemical investigations, £200; country meetings—Lincoln £108 15s. 6d., Carlisle £716 12s. 8d., Chelmsford £771 15s. 5d. The balance remaining in the hands of the bankers was £3,299 12s. 2d.”

The CHAIRMAN also referred to a letter which had been received by the Secretary from Mr. Knight, one of the auditors, expressing his regret that he was compelled by indisposition to resign the office of auditor, which he had held with great satisfaction for many years.

Mr. S. DRUCE moved a vote of thanks to the three auditors, Mr. Barker, Mr. Dyer, and Mr. Knight, for the manner in which they had discharged their duties.

Professor SIMONDS seconded the motion, which was put and carried unanimously.

The CHAIRMAN observed that it was necessary to elect a new auditor in the room of Mr. Knight, the cause of whose retirement he deeply regretted; and, as no one else's name had been mentioned, he would himself suggest that of Mr. William Astbury.

Mr. W. F. HOBBS said he was sure it was the wish of the Council, and especially of the Finance Committee, that the strictest investigation should always take place with regard to the accounts; and therefore he hoped an impression would not get abroad that they wished to recommend any one for the office of auditor who was not well fitted for it. As regarded Mr. Astbury, though he was not acquainted with that gentleman himself, he understood that he was well qualified for the performance of the duties required; but he hoped the meeting would take upon itself to name the gentleman whom they considered most suitable. It was more than ever desirable at the present time, when such things were seen elsewhere in connection with accounts, that every MS. relating to the finances of the Society should be as public as possible.

No other person having been proposed, Mr. Astbury was elected unanimously as the new auditor.

Mr. ASTBURY then moved that the thanks of the meeting be given to Professor Simonds and Professor Way, and that the meeting should express its regard at the indisposition of the latter gentleman. To those who had attended the lectures of those gentlemen it must be quite unnecessary to say anything with regard to the great services which they had rendered to the Society and to agriculture. Being personally acquainted with Professor Way, he had no doubt that his indisposition arose from excessive exertion or over-anxiety in seeking to promote some of the objects of that Society. He trusted, however, that he would soon be restored to health, and that they would have the pleasure of again seeing him amongst them.

Mr. BURNES, in seconding the motion, agreed with the last speaker, that those who had attended the lectures of the past year could not have failed to appreciate their value. The importance of chemistry to agriculturists was now generally understood; and that of the veterinary science had been clearly demonstrated by his friend on his left (Professor Simonds).

The CHAIRMAN, before putting the motion, stated that the immediate cause of Professor Way's indisposition was, that he had been engaged in some mineral investigations, and had suffered from the injurious effects of mercury.

The motion having been agreed to—

Professor SIMONDS said, in the name of Professor Way, as well as for himself, he begged to return thanks for the honour which had been conferred upon them. Occupying the position they did, they were gratified by an acknowledgment on the part of the Society that they had done their best to advance the cause of science in its application to agriculture; and by such testimony as had been given, they were amply repaid for all their exertions.

The CHAIRMAN said, the business being concluded, he would now, in accordance with custom, ask whether any gentleman in the meeting wished to put any question or to make any observation.

Mr. CORBETT said, he begged to suggest to the Council that in future the meeting of the Society should be held on some earlier day in the Smithfield week (Hear, hear). He thought that by adopting this suggestion the Council would secure a larger attendance of members, which appeared to him very desirable (Hear, hear). He hoped the Council would take the matter into their consideration.

The CHAIRMAN thought the Council were hemmed in by the charter, which required that the meeting should be held on the Saturday in Smithfield week. The suggestion should, however, be duly reported to the Council, who, he had no doubt, would give it their best consideration. Before sitting down, he wished to say that he held in his hand the balance-sheet of the Chelmsford Meeting, and he regretted to say that, although in many respects the meeting was a satisfactory one, the expenses exceeded the receipts by £1,900.

The following is a copy of the document presented:—

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.  
COUNTRY-MEETING ACCOUNT—CHELMSFORD, 1856.

RECEIPTS.		£	s.	d.
Subscription from Chelmsford..	..	1,200	0	0
Prizes offered by the Local Committee at Chelmsford ..	..	200	0	0
Non-members' fees for the entry of live stock..	..	99	2	2
Non-members' fees for the entry of implements	..	25	10	0
Implement exhibitors' payment, at half-price, for shedding required ..	..	342	10	0
Admissions to show and trial yards ..	..	2,938	8	5
Sale of catalogues of implements and stock ..	..	334	13	0
Sale of Pavilion Dinner tickets ..	..	353	0	0
Sale of Council badges..	..	2	15	0
Excess of payments over receipts on account of the Chelmsford Meeting chargeable on the general funds of the Society..	..	1,972	1	1
		<u>£7,517</u>	<u>19</u>	<u>8</u>
PAYMENTS.		£	s.	d.
Show and trial-yard works, poultry-coops, hurdles, entrance turnstiles ..	..	2,472	4	3
Extra land and railway-platform accommodation ..	..	25	0	0
Yardmen, fieldmen, clerks, money-takers, door-keepers, catalogue-sellers ..	..	227	15	3
Judges of the Show ..	..	430	16	6
Judges' refreshments ..	..	50	3	0
Veterinary inspector and assistant ..	..	26	0	0
Consulting engineers at Chelmsford, Boxted, and Ipswich ..	..	131	17	5
New dynamometer for draught of field implements ..	..	83	10	0
Hire of farm-horses ..	..	99	5	0
Carriage of boiler, dynamometers, and reaping machines ..	..	8	18	11
Metropolitan police ..	..	87	0	9
Green food ..	..	92	3	6
Hay and straw ..	..	117	14	6
Poultry food ..	..	7	0	0
Coal, clay, and sand ..	..	3	18	0
Cordage, hay-forks, rakes, hammer, nails ..	..	4	14	7
Stationery ..	..	21	1	10
Advertisements ..	..	151	16	6
Postage and carriage ..	..	25	9	4
Programmes of the meeting ..	..	5	9	0
Prize-sheets, certificates, labels, admission orders, circulars, railway papers ..	..	210	2	6
Live-stock and implement catalogues ..	..	344	6	6
Live-stock and implement award-sheets ..	..	24	13	6
Prizes of the Society awarded and paid ..	..	1,590	11	3
Prizes of the Local Committee awarded and paid ..	..	180	0	0
Prizes of the Local Committee not awarded ..	..	20	0	0
Pavilion building contract (and extra work £27 11s.) ..	..	567	11	0
Pavilion Dinner contract ..	..	475	0	0
Pavilion Dinner tickets, toast-lists, toast-master, and trumpeters ..	..	8	12	0
Badges for council, stewards, and judges ..	..	6	6	4
Official staff, travelling expenses, board and lodging ..	..	16	17	0
Gratuity to banker's clerk ..	..	2	2	0
		<u>£7,517</u>	<u>19</u>	<u>8</u>

THOS. RAYMOND BARKER,  
C. B. CHALLONER. } Auditors.

Mr. W. F. HOBBS thought it right to say a word or two with regard to the holding of the half-yearly meeting on Saturday (Hear, hear). When Saturday morning was first fixed upon for the general meeting of the Society, it was done with the intention of bringing there a large number of farmers, who might take that opportunity of expressing their views to the Council.

That day was chosen, moreover, because it was the day following that on which the dinner of the Smithfield Club took place, the commencement of the week being taken up with the admission of animals into the show-yard, and the days immediately following with matters connected with the show. Now the arrangements of the Smithfield Club were altogether different, and Friday was the very last day up to which agriculturists remained in town purely on account of the show. If, therefore, the day could be altered consistently with the charter, he thought it very desirable that it should be done; and he felt satisfied that the Council were desirous of consulting the wishes of the members generally in the matter. (Hear, hear). He had long thought that it was unnecessary that they should meet there merely to pass formal resolutions (Hear, hear); and he believed the Society would gain greatly by having that room filled, and hearing expressions of opinion from agriculturists from different parts of the country. He did hope, therefore, that the case would be met, and that the farmers of England would speak their minds freely, and declare whether or not they considered that the Society was going on satisfactorily. (Hear, hear). There was a strong feeling in the Council in favour of aiding them to do so, and he for one should ask them for their support. (Hear, hear). He had great pleasure in finding from the expressions which he had heard that the meeting, or at least a portion of it, thought that the Council should, if possible, alter the day. (Hear, hear).

Mr. WARRY said he was sorry to find, from the balance-sheet relating to the Chelmsford Meeting, that the expenses of that meeting exceeded the receipts by £1,900. That was a large sum; and he would be glad to know from what particular items the excess arose. If the Society had such a balance against it year after year, it might be very prejudicial to its interests; and it was important to ascertain where the evil lay, in order to prevent its recurrence (Hear, hear).

The CHAIRMAN observed that the excess had engaged the attention of the Council; and Lord Portman had given notice of his intention to bring the subject forward in February. At present, the funded property of the Society remained intact; but, of course, it would not continue so, if this excessive expenditure went on. There was one item in the Chelmsford account which was obviously extravagant—namely, that of the erection of the Dinner Pavilion; and the reduction of the expense in that department would, no doubt, be one of the principal means of bringing the total within a reasonable amount. The Council had not felt justified in curtailing the prizes; on the contrary, they had determined to extend them, because they were going into a district where there would be many things of peculiar interest, the exhibition of which they thought it desirable to encourage. Every intelligent farmer must, in these days, feel the importance of making great efforts with the view of providing sufficient food for the increasing population. In a leading article in the *Times* of that morning, it was observed that whereas, at the time of the last Census, four or five years ago, the population of this kingdom was only 25,000,000, it was

now probably 30,000,000. Surely, when such was the case, it became them all to exert themselves in the production of food for the people.

Mr. R. ETWALL, in moving a vote of thanks to the Chairman, bore strong testimony to the zeal and urbanity which he had always manifested in connection with the Society's operations.

Mr. J. GRAY briefly seconded the motion.

M. TREHONNAIS, in supporting it, observed that the beneficial operations of that Society were not confined to this country, but extended all over the world. He then drew a contrast between the position of agriculturists in England and that of agriculturists in France. In England, he said, everything connected with the progress of agriculture was left to individual action or the combination of individuals. In France, on the contrary, nothing could be done—no meeting held, no prizes given—without the previous sanction of the Government. The Government made the rules, controlled the proceedings, and did everything which, happily, in this country was so much better done by means of individual action.

The motion was then put by Mr. Hobbs, and carried by acclamation.

The Chairman, in returning thanks, observed that the Society had attained its present useful position through a happy union of all parties for one common purpose.

The meeting then separated.

A WEEKLY COUNCIL was held on Wednesday, the 10th of December; present, Mr. Evelyn Denison, Esq., M.P., President, in the chair; Lord Berners, Lord Walsingham, Lord Feversham, Lord Portman, Sir John Villiers Shelley, Bart., M.P., Mr. John Almack, Mr. Fuller Baines, Mr. Raymond Barker, Mr. Barnett, Mr. Barthropp, Mr. C. Bradshaw, Mr. Brandreth, Colonel Challoner, Mr. James Chapman, Mr. Whitehall Dod, M.P., Mr. Drewry, Mr. Druce, Mr. Elston, Mr. Jonathan Gray, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. J. Hudson, Mr. Jonas, Mr. Kinder, Mr. Milward, Mr. Pocock, Mr. Pope, Mr. Allen Ransome, Mr. Reeve, Mr. Scott, Mr. Shuttleworth, Professor Simonds, Mr. Simpson, Mr. H. A. Smith, Mr. W. Smyth, Mr. Tiffen, Dr. Timm, Colonel Towneley, Mr. Turner (of Barton), Mr. Weiss, and Mr. Wilson (of Stowlangtoft). Communications were received from Mr. King, of 25, Albany-street, Regent's Park, on wine made from Australian vineyards, with samples of his different vintages; from Mr. Reeve, of Randall's Farm, Leatherhead, a statement of the advantages to be derived from prizes especially offered for dairy stock; and from Mr. Ferryman, on the peculiarities of his lever-churn.

A SPECIAL COUNCIL was held on the same day; present Mr. Evelyn Denison, M.P., Lord Berners, Lord Walsingham, Lord Feversham, Lord Portman, Sir John Villiers Shelley, Bart., M.P., Mr. Raymond Barker, Mr. Barnett, Mr. Barthropp, Mr. Brandreth, Colonel Challoner, Mr. Druce, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. J. Hudson, Mr. Jonas, Mr. Kinder, Mr.

Milward, Mr. Pope, Mr. Allen Ransome, Mr. Shuttleworth, Professor Simonds, Mr. Simpson, Colonel Towneley, Mr. Turner (of Barton), and Mr. Wilson (of Stowlangtoft), for the purposes of receiving the judges' report on the trials of the steam-cultivators, and of appointing the general committees for the ensuing year.

A SPECIAL COUNCIL was held on Thursday, the 11th of December; present, Mr. Evelyn Denison, M.P., President, in the chair; Lord Feversham, Mr. Raymond Barker, Mr. Barthropp, Colonel Challoner, Mr. Fisher Hobbs, Mr. Pope, Mr. Allan Ransome, Professor Simonds, Colonel Towneley, Mr. Turner (of Barton), and Mr. Jonas, for the purpose of receiving

from the Implement Committee and Live Stock Committee their respective recommendations of prizes to be offered by the society for the country meeting of next year.

AUDIT OF ACCOUNTS, Dec. 12.—Mr. Raymond Barker, V.P., in the chair; Colonel Challoner, Mr. George Raymond Barker, and Mr. Dyer. The accounts were examined, audited, and certified as correct.

SPECIAL COUNCIL, Dec. 12.—Colonel Challoner, Trustee, in the chair. On the motion of Mr. Raymond Barker, seconded by Mr. Wren Hoskyns, the report to be made by the Council to the ensuing general meeting was taken into consideration, and agreed to.

### THE RICHMOND INSTITUTION FOR THE WIVES OF DECAYED FARMERS.

In no other country is the lesson of prudence and forethought so continually or so systematically insisted on as in our own. We impress it by every available means. We establish companies; we throw out the most tempting offers; we coax people to come to us on the easiest terms—and all to make themselves more or less independent of Fortune's caprices. From the highest class of professional duty, to the lowest scale of merely manual labour, every man thus engaged has generally something in time of need to fall back upon. Our different trades and handicrafts positively abound in such institutions; and many a pursuit of no such numerical force has still some kind of associated strength to refer to. The author has his Fund; the actor his Society; every description of artisan his Club; while the common labourer is gradually arriving by a safer path at something of the same sort. We go, however, even beyond this, and provide for those who have neglected to do so for themselves. The environs of our large towns are studded with almshouses and asylums. We give widows portions, and build children schools. Our very aldermen eat and drink with some such good purpose; and where Prudence fails, Charity begins.

But there is one great influential class that would seem to recognize neither one nor the other of these two virtues—not, at least, in that public manner which such a body might and should do. The farmer certainly can insure his house against fire, his crops against the elements, and his cattle ase. What, though, can he do beyond this? Suppose his health or his fortunes should fail him, what fund can be found to befriend him? Too gladly passing from the degrading influence of private personal charity, what institution of his own can he turn to? *None.* Or, if in the very middle or outset of a trying career he be called away, on whom can he rely to help the widow and educate the children? *No one!* If a man prosper, he may say, in the pride of his strength and the selfishness of his heart, that he wants nothing, and that he will provide nothing. If he fall, his family may go round with a parish-list, or to the parish itself. It is, however, when he does prosper, that he can make

this provision, if not for himself, for his fellows, at the least inconvenience and with the best effect. It is out of their own gain and wealth that our tradesmen and Companies support the less fortunate of their brethren.

Let the farmer look to this. With the world just now he is doing well, and now accordingly is the time to remove this charge against his character. We have said there is no such institution of self-support and relief associated with agriculture. Let us correct ourselves, and say there is none such sustained as it should be. The farmer, as well as others, has the opportunity if he will but use it: if he will not, it must be at his own cost and risk. Some few years since, with a grateful feeling that did them all honour, the agriculturists of the United Kingdom determined on presenting his grace the Duke of Richmond with some tangible expression of those thanks his conduct so well merited of them. It was one of those few "testimonials" not out of place, and never for a moment forced in its reception. The Duke met his friends in a manner worthy of himself and of them. Goodwood stood in want of no more plate, and no more would he have. Still he would turn the testimonial to a use, and to one which, while it remained a lasting honour to himself, might be made to serve for as permanent a benefit to those who had bestowed it upon him. His Grace saw, as we see yet, the want of this united sympathy amongst the cultivators of the soil. His position, his experience, and his own impulses must have continually impressed this upon him; and at the first opening he sought as earnestly as gracefully to remedy the deficiency. The Richmond Testimonial became The Richmond Institution, the funds of which were to be dedicated to the purpose "of providing annuities for the support of needy women of good character, not receiving parochial relief, being widows of decayed farmers."

The proposition, as might be expected, was well received. The Institution commenced with a fund of something like two thousand pounds, and with a fund of something like two thousand pounds has it still remained. We should be the last to attribute to the farmers of this country any want of spirit or promptness in a good cause. They were not in the best of cir-

cumstances when this association was established; and really since then, we imagine that, like ourselves, they have heard little or nothing about it. We charge no one with the blame. There was, may-be, a laudable desire not to incur any great expense, nor to fritter away the means in endeavouring to increase them. The few gentlemen in whom the management appears to be centred began no doubt with "a spurt" which their subsequent success has scarcely served to maintain. We must make all such allowances, of course. At the same time we can hardly help feeling that "The Richmond Institution" has never been half worked. Who has ever heard anything about it for the last two or three years? Or, who ever knew, or would know, there was a meeting of the Richmond Institution in the Smithfield Show week, until advised by the advertisement report of the proceedings? We do not ask for an expensive staff, grand offices, or any thing of the sort. Far from it. We believe the thing might be carried out properly at very little cost. What we want is that the Committee, or Directors, or Trustees should do what we are doing now—let the agriculturists of the United Kingdom know that there is such an institution, and that it is their duty and interest to support it.

We here ask this directly of our friends. At no other such appropriate period could we bring this matter before them. At this high season of good fellowship, friendly feeling, and charity towards all men, let them give a thought to themselves and their own class. No matter how much or how little success the effort has had so far, it is time it should have it—AN INSTITUTION FOR AIDING WOMEN OF GOOD CHARACTER, THE WIDOWS OF DECAYED FARMERS. Need we say more! Let every farmer who now knows this feel it, as most assuredly it is, his duty to subscribe towards such a fund. Let every one who reads this send in his guinea, and the Society will have a better start than ever. We only second a proposition that so good and true a man as the Duke of Richmond first made, and one which the innate promptings of every one should hasten him to respond to.

Subscriptions may be forwarded to Messrs. M. and F. Davidson, 18, South Spring Gardens, London. Or, we have no doubt that Mr. Hudson, of the Royal Agricultural Society, Mr. Brandreth Gibbs, of the Smithfield Club, or Mr. Corbet, of the Farmers' Club, would willingly undertake to pay over any sums that might be sent them.

### STEAM CULTURE.

SIR,—If the following remarks on steam culture are worthy insertion in your excellent journal, they may perhaps give a few useful hints to my brother farmers.

The system I advocate is the traction engine and endless railway, for by it the means of locomotion are obtained for performing a great amount of work in paring stubbles, ploughing, and hauling carts with manure, &c. If the season is too wet for the land to be ploughed with the traction engine travelling over it, the endless rope may be used, the apparatus of which can be hired. I do not contemplate that the use of the endless rope will often occur; for, by the present system of autumn cultivation, the farmer is enabled to do the work when the land is in a proper state for the engine to travel on it.

I may perhaps be allowed to try and disabuse the mind of the farmer as to the ugliness and unwieldiness of the traction

engine. I am not going to say it is a beautiful implement; but from what I heard in one or two places during the Christmas show, I feel convinced that many are not aware of the ease with which the whole machine may be moved and turned about. Those gentlemen who saw it for the first time at Mr. Allen's Riding School were astonished at its capabilities, and felt convinced that it was available for doing nearly all the work of a farm.

One engineer in the King-street Bazaar told me the traction engine was an uncouth ugly thing. I said I did not see much beauty in any engine. I might have told him his portable engine was the beautiful race-horse that *could not* travel, but the traction engine was the ugly cart-horse that *could* travel.

In introducing the system of steam culture there will be many arrangements to make, and many old plans to alter. A necessary operation is to have the land well drained where it is required, for the lands will have to be put into large sizes, and in many parts, instead of ploughing up and down the slopes, it will be requisite to plough across them.

The outfalls of the drained land should be so arranged that a collection of water be obtained for the use of the engine. The sinking of two or three old beer casks into the ditch, at the outfall of the drain, is a very easy and inexpensive plan. Have them well pitched, and put them side by side, with a small pipe to lead the overflow from one to the other. The ditch water should be carried past, to prevent the leaves and rubbish from getting into the casks. The engine can bring into the field enough fuel, and with the above supply, and also the water in its tank, there would be *food* enough to last it all day. I am not prepared to say exactly what kind of plough should be used, for the different soils will perhaps require different sorts; but as a practical man I feel convinced that a set of ploughs fixed in a frame, without independent action, will meet with many obstructions in foul and difficult ploughing ground.

If it is necessary to use the endless rope, the traction engine will have the power of drawing the whole apparatus into the field, and working it when there: *no* horse need be used. There is a steeage apparatus made, by which carts and waggons can follow the engine; by using one or two horses for the purpose of placing the carts in the stack-yard, or at the manure heap, the whole of the produce of the farm may be hauled by the engine. It will require a proper method to carry out the whole system, but it is easily accomplished if the farmer goes into it with the intention of succeeding. When his land has once been ploughed by steam power, he will say, like many who are now thrashing their corn by the same power, "However could I have used horses?"

The expense of purchasing the apparatus is great. We are not to look at the first outlay; we must do as our brother manufacturers do, when they find it is necessary to improve their machinery—they calculate, not the cost of the alteration, but the profit that will arise from it. We are in a better position than they are, for the expense falls individually on them, for their machinery can only be used in one manufactory, but we can use one steam engine on several farms; therefore if three or four farmers join as a company, they would be able to purchase the whole apparatus at a small individual outlay, by which means the system can be available for small holdings: it only requires a sufficient number of occupiers to join, and keep the engine always at work. The only difficulty I see to this plan is, at the time of harvest each party may require to use the engine on the same day. There will still be some horses kept on the farm, and they may, with the present plan of stacking the corn in the field, be able to get through the work. Where the farm is large enough to employ the engine the difficulty will not arise.

In using steam machinery I find that in all the work I have done, I have been enabled to do it at less than half the cost of horse power; we therefore may consider that steam cultivation will have the same advantage. If the average cost of horse power for 100 acres of heavy land is 15s. per acre, it will be reduced to 7s. 6d. If light land cost 7s. 6d., the same will be done for 3s. 9d. per acre; and taking also into calculation the increased produce from the land, when deeply ploughed, we shall find the outlay of capital will soon be repaid.

I must beg to apologize for taking so much of your valuable space.

I remain your obedient servant,

FRAZER HAMILTON.

Friars' Place, Acton, Middlesex, Dec. 17, 1856.



## AGRICULTURAL CHEMISTRY.

Below will be found a very full report of a lecture delivered by Mr. J. C. Nesbit to the members of the Launceston Agricultural Association. We have taken care to have this specially provided for, conceiving that such an address must have something far beyond any merely local weight and interest. It is, in fact, one of the great points in Mr. Nesbit's favour, that nearly everything he touches on has more or less a general application. He may desire, as in the present case, to adapt himself and his material to the district which furnishes him with an audience. He may seek to dwell on their peculiar circumstances and requirements, but he cannot do so without at the same time doing much for us all. The Launceston lecture appears to have excited the undivided attention of those who heard it. They paid their visitor the best compliment they could, when they returned again and again to some topic he had been illustrating. There was a day when the learned Professor would have had it all his own way in a company of agriculturists. When they would have just heard him out without the power to question or to comment: vastly relieved when it was all over, and scarcely retaining a word or an idea of what had been told them.

No one, perhaps, has done so much to improve upon this as Mr. Nesbit himself. He has gradually stripped science of all its mystery. He has a singularly happy way of treating its wonders as familiar things. His very manner invites us to go with him—plain, natural, and easy—he brings the great principles of his art within the scope of us all. But beyond this, his own aspirations and sympathies are closely identified with those he addresses. Few know the farmer so well, and none think more with him. Every experiment Mr. Nesbit makes, every deduction he draws, has each one its worth tested by its use to the practical agriculturist. It is through such means as these that we secure the foundation of all real improvement. Men now are able to give a reason for what they do; in place of mechanically following out a system that they took to blindfold, and which they might otherwise hand on as implicitly as they themselves had received it. It is a great thing to get people to think; and if Mr. Nesbit and his lectures have had any grand effect, it has been this. They have taught the farmer to inquire, to ascertain the causes of his different operations, and to ask boldly of science that aid and enlightenment he begins to feel he is now equal to deal with.

We have no intention to enter here on any analysis of the Launceston lecture. To properly appreciate it, the reader must do this for himself. It is a very good sample of what Mr. Nesbit can do and has done, while it comes at a very appropriate period. If anyone required to know how Mr. Nesbit had come to merit the marked thanks of the agriculturist, he might here have the

answer. For years now has he been thus engaged, elucidating and applying the abstruse studies of his art to the common business of the farm. With what manifest advantage does he carry us with him through all the great items for our consideration in improving the cultivation of the soil!—The nature of the soil itself—the effect of drainage—of lime—the food and properties of plants—the use and abuse of all kinds of manures. It is rarely one sees so much useful matter brought within so short a space of time. The best test, we repeat, of its real value and effect, is the manner in which many points were seized on by different members of the Society, and the earnestness with which they sought to have these still further defined.

To some, no doubt, there is a good deal here that may be not quite new. The common facts, however, of chemistry and science have still to be more generally diffused; while we know of no means so likely to afford them a favourable introduction as the addresses of the gentleman whom we are glad to see is becoming so well appreciated. It is our province to extend the area of his usefulness, and to spread North, South, and East, what he has just now been saying in the West Country.

## LECTURE

ON

## AGRICULTURAL CHEMISTRY.

BY MR. J. C. NESBIT.

On Tuesday, Nov. 11, a lecture on General Agricultural Chemistry was delivered in the Central Subscription Rooms, Launceston, Cornwall, by J. C. Nesbit, Esq., of the Agricultural and Chemical College, Keunington, in fulfilment of an engagement entered into by him with the committee of the Launceston Agricultural Society.

In consequence of the lecture being delivered in the evening of the day on which the annual cattle show was held, and immediately after the dinner, the attendance, which amounted in all to about two hundred, comprised a very large proportion of the members of the society and the leading farmers of the district. The lecture was illustrated by the use of tabular diagrams. The chair was again taken by C. Garney, Esq.

The CHAIRMAN, in opening the proceedings, said they (the audience assembled) had perceived, from the advertisements issued by the agricultural society of the district, that the committee of the society had engaged to lecture on that occasion a gentleman whose name most of them had no doubt heard before, and whom he now begged to introduce to them—Mr. Nesbit (cheers). That gentleman stood exceedingly high, as they were well aware, as an authority upon all questions of agricultural chemistry; and the committee had thought that

they could not serve the district better than by inviting him to come there that day, to lay before the agriculturists of the neighbourhood his views with regard to the chemical composition of manures, and other matters connected therewith, and having an immediate bearing on the operations of agriculture. He had now the pleasure of requesting Mr. Nesbit to commence his lecture (cheers).

Mr. NESBIT then came forward, and said: Mr. Chairman and gentlemen, I assure you it affords me very great pleasure to appear before you this evening for the purpose of elucidating some of those principles of science and philosophy which when applied to agriculture will no doubt produce the same effects upon that art that they have produced upon kindred arts in this country. Until recent times the application of science to agriculture was not encouraged; on the contrary, it was discouraged, I must say, by the backwardness of the farmers themselves; while other circumstances coincident with this have prevented that rapid progress in agriculture which has been found in most branches of the commerce and manufactures of our land. As you are all aware however, a change has now come over "the spirit of the dream," and within the last few years there has been a degree of advancement in agriculture which I dare say none of you remember to have taken place in that pursuit at any previous period. Now it will be my endeavour to bring before you this evening a few of the salient facts and the chief principles of science as applied to agriculture. On so large a subject it would be perfectly impossible for me to do more than touch upon a few points; and if at some subsequent period I should have the honour of again appearing before you, the points which I leave unnoticed this evening may then form the subject-matter of another lecture (cheers). Allow me in the first instance to point out to you what I have termed "the application of science to agriculture." Agriculture, as an art, has existed from time immemorial. Our fathers and our grandfathers and our great-grandfathers, and all our ancestors before them, ploughed the land and harrowed the land and tilled the land; they obtained crops and realized certain results from certain operations—in our country in one way, in another country in another way. But the facts of their art, however numerous and important, had never been collected—had never been strung, as it were, together; they were like the beads of a necklace, each unimportant by itself, but when strung together forming an important whole. Now the application of science to agriculture at the present time is to collect the facts of agriculture, facts with which you have become perfectly familiar in your own experience, and to show why certain causes produce certain effects; and I believe I shall be able to point out to you something to-night which will enable you to trace some of the facts with which you are yourselves acquainted, to certain simple and definite causes. The first point to which I shall direct your attention is the nature of soils, because I think that before we commence any investigation into the nature of plants we should know something about the character of the soils in which they grew. Viewing our planet as a whole, we may regard it as con-

sisting of earth, or solid matter; water, or liquid matter; and air, or gaseous matter. These three kinds of matter are quite capable of changing their form. The solid may become a liquid or a gas, the gas a liquid or a solid; and a liquid may become either the one or the other. The particular mode in which any of these forms of matter is presented to us depends upon heat; so that, you see, the old myth of the ancient philosophers, that fire, air, earth, and water are the four elements, is not in reality so very far wrong. Taking a broad and general view, it may be affirmed that the solid matter, the liquid matter, and the gaseous matter, aided by the light and the heat of the sun which acts upon all these, are the great elements upon which the animal and the vegetable existence of the whole world depends. Now in this county (Cornwall) we are blessed with a very large amount of a certain rock called granite, which is regarded by geologists as the primitive rock of the world, containing within itself the material from which most of the other rocks have been derived by action of some kind or other upon its surface. This granite, supposed to be the primeval rock, has been subjected to the operation of certain causes. Now granite rock consists of certain substances which are subject to the action of the air. Without mentioning at the present moment those properties of the air which act upon granite, let me point out to you that one of the chief ingredients in granite is feldspar, which is found in all the granite in Cornwall. This contains 65 per cent. of a substance called silica, which you know very well under the name of sand. I am not speaking now of the shell-sand of the coast, but of hard, gritty, silicious sand. It contains also 18 per cent. of a substance called alumina, which is the base of clay; a pure alumina is, in fact, a pure argillaceous matter. It also contains a substance called potash, to the extent of about 16 per cent. Now nothing at first sight appears more indestructible than granite rock. But there is abundant evidence that granite is very destructible, especially if it contain a large amount of feldspar. Porcelain clay, which is found in such large quantities in this county, is obtained from the decomposition of granite, and what is called china-stone is simply granite partially decomposed. Now what is the nature of the action of the air in this case? There is a certain principle in the air called carbonic-acid gas, which acts upon the potash in the feldspar, and dissolves it out; and of course, the effect of dissolving the potash is just like that of taking the mortar out of a wall—the other materials fall to pieces. If in the district of St. Austle parties did not wash out the clay in order to use it for various artificial purposes, the rain which falls from heaven, and the continual action of the air, would eventually produce the same result. And without entering into any description of other substances similar to feldspar, I would simply observe that the general origin of clay soils is the decomposition of substances containing alumina in quantities. While you find the alumina, which is a very light substance, washed down into one part, you have the silicious matter washed down into another part; and this disintegrating and washing process on different rocks goes on until you get every variety of soil that can be conceived,

from a clay to a sharp sand. Well, now, having seen that soils owe their primary origin directly to the disintegration of rocks, of which there is such an abundance in Cornwall, let us now proceed to consider the effect of atmospheric action upon soils themselves when they have been formed. Now, gentlemen, there are certain substances in the soil, which are, as I have before intimated, soluble: potash, soda, lime, magnesia, phosphate of lime, &c., are some of them. These substances are continually acted upon in the soil by the air—that is to say, they are liberated from their insoluble combinations in a soluble form, provided the air acts upon them; while in the absence of atmospheric action they are not rendered soluble. Thus we at once see the necessity of exposing the land to the air by ploughing, by harrowing, and by every other mechanical means that is suitable, in order to secure the liberation of those substances which are essential to the growth of plants. In order, gentlemen, that the soils of any given district may be properly tilled, it is necessary that they should be regularly exposed to the action of the air, that they should be properly drained, and that if lime be absent it should be supplied in sufficient quantity. Let me—taking these points in the order in which I have mentioned them—first speak of the action of the soil upon the air. Every substance—a piece of chalk, for example, has a certain amount of surface, and the surface of every solid body attracts air and moisture. It has been proved that there is more air and more moisture within the first 100th part of an inch from the surface of this glass [holding up a tumbler] than within the second 100th part; the truth being that the surface of any solid body attracts ærificerous matter. You would hardly imagine, but it is nevertheless a fact, that a piece of charcoal like this [exhibiting a piece] would, if exposed to ammoniacal gas, absorb 99 times its own volume of that gas. This piece of chalk has now a certain surface. If I break it, it will have two surfaces; if I break it again, it will have two more. And as the absorbent power of any substance depends upon the extent of surface, so, you perceive, the more you pulverize your land the greater must be the extent of surface which you expose to the action of the air. (Cheers). Every division that you make exposes a greater amount of surface, and the finer the division is, or, to use a phrase which is common in another part of the kingdom, if not here, the finer tith you make, the better the land will be adapted for the growth of plants. I again repeat, all solid bodies have the power of absorbing the liquid and gaseous bodies which are found in the air. Thus you have the ammonia absorbed from the air; and all the other materials in the air which are required for the proper development of the plant—you have all these absorbed by the finely pulverized soil, and you have that soil at the proper time liberating those substances for the roots of the plant. Let us take a case in point—a case which will serve to illustrate the necessity of well stirring up the land in order to its proper cultivation. I will suppose that you have a field of turnips. In such a season as the last, when there was a considerable amount of dry weather, you might perhaps have considered that it was not desirable to practise horse-hoeing

at such a period—you might have supposed that breaking the soil between the turnips would let in heat to the roots of the turnips, and dry them up. Now, gentlemen, remember that, if you have no rain coming down in the day, you have dews falling at night; and let me tell you that to have a thoroughly-pulverized soil, and to keep continually exposing it to the action of the air, is the best mode of absorbing the greatest obtainable amount of dew from the air, so that during the very best portion of the day the plants may have a certain amount of moisture, which they have taken from the air in the night, to sustain them. Let me, then, recommend to you the stirring and horse-hoeing of your root-plants during dry weather, if you wish to secure the greatest development for them which is attainable under such circumstances. Let me now proceed, gentlemen, to point out to you one or two things connected with draining. In the first place, you will observe that, if it be the fact, as I have stated, that the more porous a soil is, the greater amount of surface it exposes, and the greater amount of substances it absorbs from the air, when the pores of the soil are filled with water, the soil cannot be taking anything from the air. It is, therefore, clearly the very first principle of good practical farming not to have an excess of moisture in the land. The next point has reference to the depth of drains. Now I don't know whether all you gentlemen are aware that there is a certain principle in nature called capillary attraction. It is a long term; but it means the attraction of tubes or fissures. If I had this jar [pointing to a large glass jar] nearly full of common garden-soil, and if I were to allow water to penetrate the bottom of the jar, I should find the water rising up gradually until it got perhaps to the very top of the vessel. It would rise by what is called capillary attraction. Again, if I were to put a piece of sugar into half a teaspoonfull of water, the sugar would drain up all the water by capillary attraction. A similar effect is produced in the case of the soil. When the water got to the top, it would be evaporated. When water evaporates, it produces cold. You are all aware of that, from your own experience. If you get wet through, you catch cold, from that cause. The evaporation of excess-water from the surface of soils, therefore, cools them below the natural temperature, and retards the growth of plants accordingly. It is, therefore, necessary that you should keep this point, towards which water rises by capillary attraction, eighteen inches or two feet below the upper surface of the soil; for if you do not do that, you will have the moisture mounting nearly to the surface, and the cold arising from its evaporation there will produce pernicious effects. It cannot be necessary for me to tell you how essential it is that the roots of plants should be kept warm. You all know that in hothouses, and places used for forcing plants, great importance is attached to bottom-heat. One of the great points, therefore, which I have to impress upon you, with respect to draining, is the absolute necessity of so managing the operation as to prevent that evaporation at the surface, which cannot but produce a most injurious effect upon the plant. Let us next observe that there is, I think, considerable misunderstanding gene-

rally prevailing as to the manner in which drains act. We are all apt to imagine that, when we have put drains into the soil, they act from the surface, and that the water flows into them from above, and passes away. Now, gentlemen, the water never flows into the drains from the surface; it sinks through the land, and rises to the bottom of the drain. I recollect, some time ago, finding some of my agricultural friends farther east very much puzzled in reference to a particular case of drainage. There was a field in which drains had been laid to the depth of three feet, and these were found not to drain the land properly. Some five-foot drains were laid down in the same fields. Well, both sets of drains were carefully watched. A heavy shower fell. To the astonishment of the gentlemen who were trying the experiment, the five-foot drains began to run first, and they continued running steadily for many hours. At last the three-foot drains began also to act; and the two sets ran steadily for some time, the five-foot drains, however, evidently delivering the most water. At length the three-foot drains ceased running; and some considerable time afterwards the flow of water from the five-foot drains also terminated. That which seemed very singular to the observers was, that the upper or three-foot drains, which were nearest the surface upon which the rain fell, were the last to run and the first to give over; while the five-foot or lowest drains were the first to run and the last to cease. That which seemed puzzling was, that the water from the surface should pass an outlet three feet in depth, to issue from one two feet lower. But what appeared paradoxical in this case, arose from the belief in the observers that the descending water enters a drain from the top, whereas it is easily susceptible of proof that water enters drains from the bottom. If we were to take a common puncheon, say of six feet in depth, and were to insert a tap or tube one foot from the bottom and another three feet from the bottom (that is, respectively five and three feet deep), and were to fill the puncheon with sand or earth, we should have, on a limited scale, an accurate representation of the field in question. If we were to commence pouring water into the top of the puncheon, the liquid would find its way to the bottom of the cask, passing both the outlets without running out. As, however, we continued to pour in the fluid, the water-level in the cask would gradually rise until it attained the height of the lower tap or drain, when, *entering that aperture from the bottom*, it would immediately make its escape from the vessel. If we still continued to pour in water at the top in quantities greater than could issue from the lower vent, the water level would continue to rise until its surface reached the under part of the upper or three-foot exit, whence it would also begin to flow. If we still poured in water until the butt was filled, that is, until the water-level should reach the surface of the soil, and then were to cease, we should find that for some time both apertures would continue to run; that when the water-level had descended three feet the upper drain would cease, and that the lower drain would continue to run until the level of the fluid had descended to five feet, when no more could issue, and the water-level would remain at a

distance of five feet from the top of the soil. It is, therefore, perfectly apparent from this view of the facts of the case, why the lower drain must necessarily first and last discharge more water than the shallower drain. Let me further say, gentlemen, in reference to this subject, that deep draining, with the drains at very long distances apart, cannot, in my opinion, be right. Moreover, the idea that any one can lay down a system of drainage which will be applicable in all cases, seems to me preposterous. Draining, to be effectual, requires a knowledge of the peculiarities of the land to which it is to be applied. It is quite absurd to suppose that there can be one unique or unvarying system of drainage, when Nature is so varied and so distinct in her forms, appearances, and operations. I may here add, that with drainage there ought generally to be associated subsoil ploughing. Now, it was not my intention to enter at any length into the subject of drainage, because it is a question which would, in fact, require a whole evening to itself, so many and so varied are the phases which it presents; so different are the requirements of different soils. I now go on to speak, therefore, of the use of lime. This is a matter of considerable importance to all western farmers. Throughout the eastern and the midland districts of England lime is found very generally disseminated, not only in the limestone rocks there, but also throughout the clay soils; and, consequently, the application of it to the land is not required there to anything like the same extent that it is here. On the other hand, in those soils which prevail towards the west, lime is, as I know from my own analyses, found generally only in very minute proportions, and then not always in the condition in which it ought to exist in the soil in order to develop its best characteristics and powers. Hence the large amount of lime which has been found practically useful here in the form of simple lime; and further to the south and the west in the form of shell-sand, which is carried on to the land in large quantities. Now, the action of lime, gentlemen, is this: it helps to liberate a certain amount of the insoluble materials in the soil, which would otherwise not be liberated within the same period of time. If I were to powder a piece of feldspar, mix it with common water and some lime, and then leave the whole for a twelvemonth, I should, at the expiration of the period, find a much larger amount of potash liberated through the action of the lime than could have been liberated had there been no lime. So that lime, you see, produces a very powerful effect in liberating and making soluble some of the mineral ingredients of the soil. It also operates powerfully in relation to the dead vegetable matter which exists in the soil, helping it to assume the form in which it is best adapted for the production of vegetable life. Let me mention a case which will serve to illustrate how powerful is the effect of the use of lime. A few years ago, having had some soils at Exmoor sent to me for examination, my report upon them was this: "You may use guano, you may use superphosphate, or anything you please to stimulate production; but if you do not also use lime the result will not be satisfactory; lime is the first essential, and after that has been applied, you may

have recourse to artificial manures." Well, a 20-acre field, on Exmoor, cultivated by Mr. Smith, the well-known and intelligent steward of Mr. Knight's property, was pared and burnt, and lime was applied to all but about an acre, where, in consequence of there not being enough lime brought up for the whole, none was used. The whole of the land had guano applied to it, and the turnips were drilled with superphosphate of lime. To one inch, where lime was put, there was a beautiful crop of turnips; and to one inch, where no lime was put, there were no turnips at all. This is a case which clearly proved how necessary is the presence of lime. But, gentlemen, if I were to tell you that you might go on liming year after year without doing anything else, I should be saying what might lead you into a very great error. Lime ought to be regarded by you as an *amendment* to the soil, not as a *manure*. You ought to consider lime as a substance to be added to the land occasionally, chiefly in order to ameliorate its condition, and render it better adapted for the application of manures, though of course at the same time it supplies a certain amount of lime to the plant itself. You should on no account apply it indiscriminately, and to any amount. If you do that, you will bring your land into a bad state, and will lose a certain amount of income—a result which is to be carefully avoided in these days of high rents and taxes. In order to proceed on the right basis, you must, as I have before intimated, view lime in the light of a substance to be used occasionally, and not in place of a proper and continual supply of manure. I have mentioned this matter thus minutely because I know there is in many places a very great want of a proper understanding with regard to the use of lime. If you have enough lime already, to apply more is like sending coals to Newcastle, or throwing them into the sea: the addition of more will produce no effect. I know that many of the farmers in the southern and western parts of Cornwall have declared that they do not like using shell sand, because they do not find it to act in the land. I have discovered by analysis that this view, at least in some instances, is correct—that many farms have got enough of this extraneous matter already. When such a substance has been carted on the land year after year for perhaps two or three hundred years, it is but natural to suppose that there is now sufficient calcareous or limy matter for the purposes of cultivation, and that the period has now arrived when, if other substances are applied, the land will, in consequence of the presence of lime in adequate quantities, be perfectly prepared to make the best use of them. I must now speak to you, gentlemen, of vegetables, or the various crops which you grow. What are they, and what do they contain? Without speaking of the vegetables which grow in the sea, and which only require roots for the purpose of being attached to rocks, and having a hold there, I may observe that the vegetables which are cultivated on the farm are found to have a root and a stem, or at all events to have a portion which grows in the land and a portion which grows out of the land. That portion which grows in the land, and which is called the root, serves two purposes: it serves as a holdfast for the plant in the land, and it also serves, by

means of the little pores which are found throughout the root, to absorb those matters from the soil which the plant requires for its development. The plant also sends leaves into the air, and these act by absorption upon any materials contained in the air which may be essential to the plant. Now, gentlemen, if you have been in the habit of considering that plants derive all their materials from the soil, you have been in the habit of considering wrongly; for they derive on the average nine-tenths of their weight from the air, into which the leaves shoot, and about one-tenth—and many of them very much less than that—from the soil in which they grow. It is on this point that I wish now especially to address you. If I burn this piece of paper (holding it up), paper being in fact a vegetable, the ash which is left behind is what came from the soil: that is called the mineral or inorganic matter, consisting of the phosphate of lime and the potash, and the other materials which the plant may happen to have derived from the soil. All that which burns off and goes into the air was derived originally from the air. So that this analysis is exceedingly simple. That which does not burn off, viz., the ashes, originally came from the soil; that which burnt off, originally came from the air. Now, gentlemen, I wish to speak to you of those materials which plants derive from the air, and from the water which comes down from the air. There are only four substances which plants derive from the air, and, though I am very much afraid of introducing too much chemistry, I must give you some account of each of them. One is called oxygen, another is called nitrogen, another hydrogen, and another carbon or charcoal. I must, I say, endeavour to convey to you some idea what these four substances really are. I am probably addressing many persons who are as well acquainted with these substances as myself; but I think it best to go to the bottom, in order that none may be without the requisite information. Here we have, then, oxygen, nitrogen, hydrogen, and carbon. Now let us begin with oxygen. Oxygen, gentlemen, used to be called vital-air, because animals are absolutely dependent upon it for their life: they cannot exist without it. If we were deprived of the oxygen which is found in the air, we should all die, die by suffocation. Death by drowning is nothing else than the cessation of breathing for want of the vital power in the air. Common air contains oxygen in the proportion of one-fifth, that is to say, five bushels of air contain one bushel of oxygen. This substance in air is diluted by another substance, called nitrogen; and if it were not so diluted, we should be placed in considerable difficulty, because it is so powerful a burner, so strong in its action, that it would burn everything up. If I had a jar of oxygen, and were to introduce within it any burning body, you would immediately see the combustion increase to an enormous extent. I have got a little oxygen in a glass on this table, and if it has stood the journey from London you will see the effect which I have mentioned. [A piece of ignited wood was here inserted in the aperture of the glass, where it burnt with greatly increased intensity.] The increased intensity is entirely owing to the oxygen. This substance it

is which serves to burn up all our fuel. You can now understand why, if oxygen were not diluted by four times its own volume we should be incapable of existing. Everything would then be burnt as quickly as a piece of paper when put in the fire. Now let me introduce into a jar of oxygen a piece of ignited charcoal or carbon, which I was speaking of, in order that you may see how much more brilliantly it burns there than it does in the ordinary atmosphere. [Experiment performed.] The produce of this union is called carbonic acid, or charcoal gas, and of its properties I shall shortly speak. Well, now, gentlemen, after what you have just seen, you cannot be surprised when I tell you that this substance, which is always found in the air, is most active in the decomposition of manure-heaps and of animal and vegetable matter generally. To this point it is my intention to allude farther in an after-part of the lecture. Well, now, oxygen is also found in water. Water consists of hydrogen, one of the other elements of which I spoke, and oxygen. You must bear in mind the difference between these two substances. Oxygen is the body which consumes everything: hydrogen is one of the substances which is burnt. All tallow, all oils, all wood, all things generally which burn with a flame contain hydrogen. Hydrogen is, as I have just stated, found in water, and it can be liberated from water with perfect ease. Water, as I have just told you, consists of oxygen and hydrogen. If I put into water something which likes the oxygen better than the hydrogen does, the hydrogen will be liberated. I have got here a metal called potassium, discovered by a Cornish man named Sir Humphrey Davy, and this substance has the power of instantly decomposing water; the moment it comes in contact with the water the water will be decomposed. This potassium, which is, I repeat, a metal, will unite with oxygen—the powerful substance which I showed to be contained in water—will with it form a substance called potash, and the hydrogen will burn on the surface of the water. [Experiment performed.] What you saw burning was the hydrogen liberated from the water, not merely the little piece of metal that I put in. Well, now, gentlemen, you perceive that there is such a thing as the decomposition of water; that which you saw burning was the hydrogen gas, of which I had previously spoken. Now water can be decomposed in other ways besides that which I have introduced. There is in this bottle some common zinc. I will put a little water to it and some oil of vitriol, when the zinc will unite with the oxygen of the water, forming oxide of zinc, which will be dissolved by the acid, and the hydrogen of the water will at the same time be liberated. If the gas thus set free were mixed with oxygen, and a light applied, there would be a loud explosion, and I must therefore allow the gas to be liberated for a certain time, in order to drive out all the air. [Experiment proceeded with.] Now we have a liberation of the gas, and you see it burning there. Why does it burn? Because, by placing the light near it I have caused sufficient heat to enable it to unite with the oxygen of the air. [Experiment continued.] The gas produced from the water is now uniting with the oxygen of the air, and is form-

ing water again. You know that the vapour of water can be deposited on cold bodies in the form of dew. If I hold this glass [exhibiting a tumbler] over the burning hydrogen, you will find the glass will immediately become dim, from the deposition of moisture produced in the act of burning [describes experiment.] We have, therefore, in this experiment a decomposition of water in the interior of the vessel, and its recomposition on its exit, both going on at the same period of time. Now, gentlemen, let me point out to you that when any substance containing hydrogen is burnt, water is given off. Take, for instance, a piece of paper. This [holding up a piece of paper] is a vegetable product containing hydrogen, and if I set it on fire and hold it under this glass, you will find the glass becoming filled with dew. [Experiment performed.] It is now perfectly dim with dew. If I hold a cold glass over burning wax, which also contains hydrogen, a similar effect will be produced. [Experiment performed.] And if I do the same with any other vegetable matter, the result will be similar. I have now spoken to you of oxygen, which is the active burning principle of the air, and one of the constituents of water; and of hydrogen, which is the other constituent. Let me now speak of nitrogen. Nitrogen exists in the air to the extent of four-fifths of the entire bulk. It is in itself very inert, having no particular action by itself. Some of its combinations are very curious. For instance, nitrogen and charcoal, with some hydrogen, forms the powerful poison called prussic acid. Saltpetre, which contains nitrogen, mixed with sulphur and charcoal, forms the gunpowder by means of which men blow each other to pieces; and, in fact, nitrogen is found in almost all our powerful explosive compounds, such as fulminating silver, gun cotton, &c. Nitrogen, existing in nitrate of soda and guano, is, however, used for the far different purpose of assisting in the growth of the farmer's crops. So far, however, as the farmer is concerned, what it is chiefly necessary for him to know is that nitrogen is the main constituent of ammonia, and of nitrate of soda, and of guano, which are all so very valuable to the cultivator of the soil. I now come to carbon or charcoal. I gave you just now an example of the burning of charcoal, but I did not point out the properties of what was then produced by the burning of the charcoal. Has it never struck you that when coal or wood is burnt, nothing but the ashes seem to remain? What has become of the bulk of the materials? It has passed into the air in an invisible form; and, so far as the charcoal is concerned, that portion has passed into the air in the form of a substance which is commonly called carbonic-acid gas, but which we will also call charcoal gas. Now carbonic-acid generally exists in the form of a gas; it comes out in the form of an effervescence in bottled beer, in champagne, or in soda-water; and it is also given out in the burning or decomposition of any animal or vegetable matter containing carbon; and when I tell you that it is this carbonic-acid gas that kills so many men who incautiously descend into wells or brewers' vats, and that it is, in fact, identical with what is termed choke-damp by miners, you will admit that it is a most important agent wherever it is found operating.

Let me now exhibit to you one of the effects of this gas. It is a substance which has the power of uniting with lime-water, and forming a white sediment, which is, in fact, carbonate of lime, or chalk. I will take the bottle in which I burnt the charcoal in a previous experiment, and will introduce some lime-water; on agitation you will observe that the lime-water, which at first was transparent, is now white like milk. [Experiment performed. Mr. Nesbit then showed by similar experiments that carbonic acid was given off by burning wood, paper, wax, and other similar bodies containing carbon.] I may here observe that we ourselves, and other animals, are all like so many steam-engines. We are obliged to take in so much food every day to maintain the animal heat, and to keep the machine in motion; by every inspiration we taken in oxygen, and by every expiration we give out carbonic acid, which is derived from the combustion of the charcoal of the food which we have eaten. If I pass the breath from my lungs into this lime-water, you will find the same kind of deposit that you have before observed produced from the gas proceeding from the burning of charcoal. [Experiment performed.] So that you see, gentlemen, whatever may be the manner in which charcoal or carbon is burnt, whether it be burnt in the form of charcoal itself, or as it exists in paper, or wax, or tallow, or as food in the animal system, the result of the combustion is carbonic-acid gas. Now, in order that the properties of this substance may be well impressed upon your minds, I shall place it before you in tolerably large quantities, and will endeavour to show you some of its properties. I have here a quantity of chalk, which is carbonate of lime—that is to say, a combination of lime with carbonic acid. I dare say many of you have heard of poor unfortunate people sleeping near lime-kilns, and being killed by the fumes which came from them. Those fumes consisted of carbonic acid. Now, I can liberate the carbonic acid in an easier way from the carbonate of lime than by heating it; all I have to do for that purpose being to put a stronger acid to the carbonate, when the strong acid will take the lime, and the carbonic acid will escape. The acid I shall use is called muriatic or hydrochloric acid, or spirits of salt, and I shall now put it over the chalk in this jar. [Experiment performed.] You here see a very considerable effervescence, which is caused by the liberation of the carbonic acid. Now, carbonic acid, gentlemen, is one and a-half times heavier than common air, and that is the reason why it collects at the bottom of wells and pits, and other places of the same kind. We have it now collecting in this vessel [pointing to the large glass jar]; though we cannot see it, it is certainly there. I speak of carbonic acid; I speak of what is contained in the apparently-empty space above the liquid in the jar. I will send down into the jar what I may call a little searcher [referring to a little ignited wax taper at the end of a wire]; and as soon as this searcher comes in contact with the carbonic-acid gas in the jar (which may represent a well containing this gas), the light will go out. [The flame was here let down into the jar, and was instantly extinguished.] If a man were to go down into a well of the same kind, his life must go out just

as that flame went out; for what prevents the combustion of a candle would prevent combustion in a man: the man's life would be as utterly extinguished as was that flame. But I have to show you also that this gas is identical with that which I have previously produced by the burning of charcoal. [Some of the gas was here poured into a vessel containing lime-water, and the white precipitate of carbonate of lime was immediately produced.] Now, gentlemen, I have been the more particular with these experiments upon carbonic acid because, although the thing is invisible to your eyes, it is nevertheless quite capable of proof that it is from this gas that every one of your vegetables derives the whole of the charcoal which they contain. I have just one more experiment to make before I proceed. If I take this glass, containing carbonic acid, and pour the gaseous contents over one of these candles, I have not the slightest doubt that the candle will go out. [Experiment performed, the result being what was intimated it would be.] I must now endeavour to give a practical turn to the subject-matter of the lecture. I have endeavoured to point out the nature of the soil and the effect of drainage upon it, and the necessity of keeping it in a pulverised form, in order that it may be in a proper state to absorb moisture, and to appropriate the various substances contained in the atmosphere. I have also described the four substances which constitute the organic matter of plants—the oxygen, which burns; the hydrogen, which is burnt; the nitrogen, which is found in saltpetre and nitrate of soda; and the charcoal, which, when united with oxygen, forms carbonic-acid gas. With regard to this last, I may add that it is found in the air, in the proportion of one part to every two or three thousand; and from this source it is that plants derive all their carbon. It will perhaps be our best course to direct our attention now to the nature of plants. As I before remarked, vegetables have roots and leaves. Their rootlets go down into the soil, and thence obtain the nutriment in the soil; their leaves go out into the air, and there seek the nutriment which is contained in the air. Now it is a curious fact, that when the light of the sun, or the diffused light of day, is shining upon the leaves of plants, these leaves have the power of taking in carbonic-acid gas from the air, of retaining the charcoal or carbon of the carbonic acid, and the hydrogen of the water, within themselves, and of giving the other constituent of these substances—viz., oxygen, or vital air—back again to the atmosphere. However strange this may seem, it is nevertheless true. One single experiment will suffice to prove this. If you introduce a sprig of mint into a bottle of water containing carbonic acid, you will, after exposing it for a time to the light of the sun, find it covered with little globules; and if you collect all these into one globule at the top, you will find pure oxygen gas. Another experiment is that of a celebrated French chemist, who placed a living branch of a vine in a glass tube, and then covered the tube all over with blackened paper, so that no light could penetrate, and he sent a current of air through it containing about five per cent. of carbonic-acid gas. He sent this through the tube, and did not expose it to the light. He found that the tube at the

other end, which passed through lime-water, gave an abundant precipitate, showing that the leaves had no action on the charcoal gas. He then took off the paper, and exposed the tube and vine-branch to the light of the sun; and on now sending the stream of air and carbonic acid through the apparatus, not a trace of carbonic acid was found to pass through at the other end. Another point which you have to remember is, that plants obtain the largest amount of their nutriment from the air. You shall plant a forest upon land which contains no vegetable matter—I might say, upon Brown Willy or Rough Tod; you, or some one else coming after you, may, at the end of say fifty years, remove cart-load after cart-load of timber, and yet, at the expiration of the period, the soil shall be richer in vegetable matter than it was when the trees were first planted. Where did all this vegetable matter come from, if not from the air? Again, in the case of a field of turnips, it is the action of the leaves of the turnip upon the air that secures the greatest amount of vegetable matter. Bear in mind, then, that plants are dependent in a far greater degree upon the air than upon the land; that so far as the land is concerned, you can only, after a due supply of mineral matter, assist the plant in endeavouring to obtain more organic matter by its roots from the land than it could naturally obtain by its leaves from the air; and in this consists the true principle of manuring. I must now proceed to speak to you about the production of farm-yard dung. That is the *sine quâ non* of farmers, and I am afraid that some farmers attach too much importance to it, regarding it as if nothing else could possibly equal it in value. Now, gentlemen, what is farm-yard dung? I am not about to speak now of all the various modes of manuring which are adopted, though I have heard it stated that the decomposing vegetable matter differs greatly in different counties. Farm-yard dung is neither more nor less than decomposed vegetable matter, derived from plants which once had life in the soil, and which, when returned to the land, will furnish the necessary elements for reproducing vegetable life. The manner in which it is decomposed—the mode of reducing it to a proper state for its application to the land—is quite another question. Is what I have heard stated true, that in Devon-hire and Cornwall there are parties who are in the habit of strewing their straw on the high-roads and bye-roads? Is it true that in this county it is the practice to place vegetable matter in a position in which everything in it that is valuable is likely to be washed away? If that is the mode of making farm-yard manure which is adopted in this district, or in other districts, all I can say with regard to it is, that it is not a mode which I should recommend for imitation. Gentlemen, in considering the subject of the decomposition of vegetable matters, you must remember that some elements of vegetables are volatile, and some soluble, and that those which are least volatile and least soluble are also least valuable. The substance in manures which is most volatile is ammonia; and where there is bad management this will pass away into the air; while the potash and the soda, and the other soluble materials, will be washed away. As compared with the practice which I have mentioned, would it not be well

to put your straw in the farm-yard sheltered from wet, and place your feeding animals upon it? because, in that case you would have the dung of the animals upon the straw, and the vegetable matter also. The truth is, that every possible precaution ought to be taken against losing anything valuable that is contained in vegetable matter; and with this view you should seek to have a proper amount of moisture and no more, and endeavour to associate farm-yard manure with materials which will tend to fix the ammonia, and so on, and prevent it from passing away. Now the quality of the manure must depend on the quality of the vegetables on which you feed your animals. If you feed them merely upon straw, the value of the dung will be in proportion to that of the straw; whereas, if you add oilcake, and other substances of a similar nature, there will be a proportionate increase of value. There is no ultimate action in the animal economy—no action, that is, in relation to the food which the animal consumes, that does not take place in ordinary decomposition. If you decomposed a large quantity of vegetable matter, whether it were oilcake or straw, you would have just the same ultimate result as if you passed it through the body of an animal. The animal system does not add anything whatever to its value: the animal only gives forth what it received. Indeed, so far as manuring is concerned, the dung of the animal is always less valuable than would have been the food on which the animal had subsisted. It must, therefore, always be borne in mind by practical farmers that the animal adds nothing to food, but only subtracts from it. Many persons are apt to imagine that the fact is otherwise; but they are certainly mistaken. If you had more turnips than your sheep required—and I have known such an instance—and were to chop up a field of turnips and plough them in, the result would be that you would afterwards get a far better barley crop than you would have done had sheep, by eating them, robbed the turnips of a portion of their value. I have seen that experiment tried over and over again, and it has always been attended with the same result: therefore theory and practice perfectly coincide in this matter. Well, now, with respect to the making of farm-yard manure, let me impress upon you that, so far as the quality is concerned, that depends on the food of the animal; and that in order to its conservation you must protect it against water. It is my opinion that, with the view of most effectually preserving the ammonia, you had better make a kind of compost heap, first spreading a quantity of ditch stuff, road scrapings, or other earthy matter, and then putting a layer of dung, then another layer of earth, and so on, alternating the earth with the dung in such a manner as will be most likely to cause the earth to absorb the substances which would otherwise pass into the air, and to prevent the wasting away of the soluble materials. You will, I believe, secure a far better kind of farm-yard dung in that way than by any other mode of proceeding with which I am acquainted. It is the duty, or at least the interest, of every one to try and make the vegetable matters of the farm go as far as he can; though, however, he may aim at doing this, he will never be able to produce upon the farm all that it actually requires; and hence he will occasionally be



obliged to resort to extraneous sources to supply the deficiency. I am afraid I am detaining you, Mr. Chairman and gentlemen, at too great length. The subject is such an extensive one that there are one or two other points which I desire still to introduce, but it must depend upon yourselves whether I shall do so (loud cries of "Go on"). Well, I will first mention the rotation of crops, and afterwards speak for a few moments in reference to artificial manures. With respect to the rotation of crops, I wish to point out to you a very clear and simple illustration. Taking the four-course shift as the example—though it may be expanded to six, or eight, or ten, or any number that you please—I will suppose that you have turnips and barley and seeds or peas and wheat as your rotation. I am aware that you are in the habit of leaving seeds for two or three years. I do not wish now to express any opinion with regard to that practice; but I will just state what I consider to be the true theory of crops, taking the four-course system as the rule, and bearing in mind that it may easily be expanded. After draining your land, and getting it into proper condition, you sow it for turnips. Now turnips are plants having a large development of leaves. They send their roots downward in search of nourishment; they send their large leaves into the air. With every breath of heaven that passes over the plant, the leaves absorb the carbonic acid of which I have been speaking; they give out the oxygen, and retain the carbon; they absorb the ammonia from the air, and their roots draw up from the soil the mineral matters; and these, uniting together, are the sources of the materials which the turnip stores up in the form of its bulb. The turnip intends, from these accumulated materials, to produce turnip seed. But you, gentlemen, step in and say—"We don't want turnip seed; we want mutton or beef." And in order that you may have these, the turnips are eaten by your sheep or bullocks, and the manure produced is used for obtaining a crop of barley. I know you do not feed sheep here to so great an extent as they are fed in the eastern parts of the kingdom, but the argument is still the same. The matters, therefore, which the turnips obtained from the air are employed in producing more barley than the land would produce naturally. Barley being a narrow-leaved plant, you obtain for it, by means of the turnip plant, a large amount of the substance which barley most requires; this is put into the soil and taken up by the roots, and is assimilated by the barley, the result being that you produce four or five quarters of barley instead of the one or two quarters that you would obtain naturally. So that you employ, in fact, the great absorbing powers of one plant to assist the smaller powers of another. You must recollect, however, that if the relative prices of the productions were different, the whole of your operations would be different, so artificial and relative are the processes of agriculture. Well, with respect to clover, although clover is not a plant with large leaves, it is a plant of great foliage, and every little leaf that it sends into the air sends a rootlet downwards; so that in exact proportion to the amount of foliage above the ground will be the quantity of the roots below. Well, then, supposing it possible that you are constantly feeding off clover in

the spring, I would remind you that every time a sheep bites a leaf off, it stops the growth of the rootlet connected with that leaf, for each leaf has its corresponding rootlet; and as it is the roots below that furnish increased nutriment for the wheat, so if you do anything whatever to stop the growth of the roots, you to that extent diminish the amount of the wheat crop which you intend afterwards to get from the land. Now if, instead of feeding off the clover, you were to cut it twice, removing the hay each time, and were then to plough the roots into the land and well work them, you would, I am sure, get a larger amount of produce from the land than you can possibly obtain under the system of feeding off. Gentlemen, this may be new to some of you, but it is not the less true. I will give you an instance—I might give you fifty. A friend of mine in Northamptonshire had a field of twenty acres of clover. It was all cut at Midsummer, and the hay removed; one-half was subsequently fed off, and the other was allowed to grow until September, when it was cut, and a good crop of hay was removed from the land. A portion of each part of the field was then dug up, and the clover roots separately weighed. Where it was cut once and fed once, there were thirty-five hundred-weight of roots per acre; where it was cut twice, there were seventy-five hundred-weight of roots per acre—being a difference of two tons of valuable vegetable matter in the soil in favour of the land where the upper growth had been twice cut and wholly removed away. It is, you perceive, the decomposition of the clover roots in the land which furnishes the additional amount of manuring matter necessary for the intended increased crop of wheat. Having now said all I intended to say with regard to the rotation of crops, I proceed to say a few words with respect to the use of artificial manures. I am persuaded that there is no part of the country which is more likely to derive benefit from the application of artificial manures than Cornwall. Owing to the hilly character of the district, there is great difficulty in carting farmyard manure, even if it could be produced in adequate quantities; and I need not tell you that, where you have to put ten or fifteen loads per acre, the expense of cartage must be much greater than it would be if you could obtain the same result with one load of another manure. What I have now said indicates, in some degree, the position in which you are now placed. I am certain that in the next five years the agriculture of Cornwall will receive an impetus such as it has never experienced hitherto; because the Cornish farmers will now be enabled to grow abundant crops, with the aid of artificial manure, in places where manures hitherto have, in consequence of their bulk, been practically unattainable. But let me tell you, gentlemen, that you have to guard against adulteration. I have myself spent a great portion of my time in exposing the various adulterations of manures. I have, too, recently met with an instance in which parties, calling themselves a company, have presented themselves before the world as being associated for the special purpose of protecting the interests of that unfortunate being who is supposed not to be capable of protecting himself—the British farmer (laughter); and these gentlemen declared that by them,

at least, no adulteration should be sanctioned. Gentlemen, a guano which was offered by these parties to the British farmer at about £10 per ton—the price of genuine Peruvian guano being, you will observe, £12 per ton—was ascertained by me on analysis to be worth only about £2 10s. per ton; while a quantity of super-phosphate of lime, which was offered at £7 per ton, was also ascertained to be worth only about £2 14s. per ton. These analyses were made within the last few weeks. Of course, these adulterated articles were sold to some one, and it is as likely, perhaps, that they will be offered in the West of England as in any other part of this country. (Laughter). All I can do is to recommend you to take proper precautions against imposition. Imitate the conduct of honest manure dealers, who never allow anything to come into their manure works without knowing what it is. Never allow, if you can help it, a single artificial manure to come upon your farm without having ascertained previously of what it consists. The cost of an analysis is very small, compared with the loss which you would sustain by using a spurious manure to assist you in the growth of your crops. If we could only induce the farmers to join us in this work of detection and to have their artificial manures analyzed, the whole tribe of dishonest manure-dealers would vanish from the face of the earth as quickly as so many mushrooms. Well, now gentlemen, I have put down certain approximative valuations of the principal substances contained in artificial manures, in order to assist you in forming correct notions on this subject.

APPROXIMATIVE ESTIMATION OF THE VALUE OF MANURES.

In consequence of the variation in the composition of manure, and the constant adulterations practised by unprincipled dealers, it is a matter of considerable importance to the farmer to be able in an easy manner to obtain an approximative value of any manure which he may have subjected to analysis; and we subjoin a mode of valuation, the use of which will at least save him from the gross imposition to which he is at present subjected. The substances which analysis and practice have proved to be most efficient as manuring principles are phosphates, and nitrogen in any of its forms. A few isolated experiments prove potash to be of some value in one or two crops; but, as this substance can readily be bought in a state of tolerable purity as sulphate or muriate of potash, and as it is not generally found in compounded manures, we shall not give this any agricultural value, further than as comprised under the term of alkaline salts. Silica, under any of its forms, has not yet been proved to have any agricultural value; and carbonate of lime (chalk) is in most instances a serious detriment to a manure, though useful on the large scale, when used per acre by tons at a time. From a careful comparison of numerous analyses of manure with the value of the substances therein contained, we have been led to adopt the following prices as giving the nearest approximative value of the several manuring matters:—

	MULTIPLIERS OF VALUE.
Nitrogen .. .. .	£74 per ton.
Ammonia .. .. .	6) "
Phosphate of lime .. .. .	8 "
Phosphate of lime made soluble .. .. .	24 "
Organic matter .. .. .	1 "
Alkaline salts .. .. .	1 "
Sulphate of lime (gypsum) .. .. .	1 "
Silica .. .. .	No value.
Carbonate of lime .. .. .	No value.

The following mode of calculation has been adopted by me for many years, and is exceedingly simple, as we only require the

analysis of the sample to enable us to arrive at its worth in a very few figures:—

RULE FOR CALCULATING THE VALUE OF MANURES.

Consider the analysis to represent the components of one hundred tons. Multiply the respective amounts of each ingredient by its price per ton in the preceding table, add up the several products, and the sum will represent the value of one hundred tons. Divide this amount by one hundred, and the quotient will be the price per ton. The decimals in the analysis below 0.5 may be disregarded, and those above that amount reckoned as an additional unit. Thus, in the second example, the organic matter, instead of 21.68, may be read 22; and the phosphate of lime, instead of 44.35, may be called 44.

EXAMPLES.

I. VALUATION OF AN AVERAGE SAMPLE OF PERUVIAN GUANO.

	Value per Ton.	Total.
Moisture .. .. .	15 10	
Organic matter .. .. .	51.27 × £1 =	51
Silica .. .. .	2.20	
Phosphate of lime .. .. .	22.13 × £3 =	176
Phosphoric acid .. .. .	3.23	
= Phosphate of lime (made soluble) .. .. .	7.00	× £24 = 168
Alkaline salts, &c. .. .. .	6.97 × £1 =	6
	<u>100 00</u>	
Nitrogen (equal to) .. .. .	13 51 per cent.	
Ammonia .. .. .	16.42 × £60 =	930
		<u>1,001,131.61</u>
		20
Value £13 12s. per ton.		<u>12 20</u>

II. VALUATION OF A SAMPLE OF BOLIVIAN GUANO.

	Value per Ton.	Total.
Moisture .. .. .	13 85	
Organic matter .. .. .	21.68 × £1 =	22
Silica .. .. .	2.70	
Phosphate of lime .. .. .	44.35 × £3 =	332
Phosphoric acid .. .. .	3.39	
= Neutral phosphate (made soluble) .. .. .	7.15	× £24 = 168
Alkaline salts .. .. .	14.12 × £1 =	14
	<u>100 00</u>	
Ammonia .. .. .	4.62 × £60 =	240
		<u>1,001,796</u>
		20
Value £7 19s. per ton.		<u>19 20</u>

III. VALUATION OF A GOOD SAMPLE OF SUPERPHOSPHATE OF LIME.

	Value per Ton.	Total.
Moisture .. .. .	19 52	
Organic matter .. .. .	20.72 × £1 =	21
Silica .. .. .	1.80	
Soluble phosphate .. .. .	19.25	
= Neutral phosphate (made soluble) .. .. .	16.00	× £24 = 384
Insoluble phosphate .. .. .	16.60	× £3 = 136
Hydrated sulphate of lime .. .. .	29.81 × £1 =	30
	<u>195 00</u>	
Ammonia .. .. .	2.09 × £60 =	130
		<u>1,001,691</u>
		20
Value £6 18s. per ton.		<u>18 20</u>

IV. VALUATION OF A BAD SAMPLE OF SUPERPHOSPHATE OF LIME.

	Value per Ton.	Total.
Moisture .....	17 90	
Organic matter.....	14 00	× £1 = 14
Silica.....	29 10	
Oxide of iron, &c.....	8 62	
Soluble phosphate.....	3 21	
= Neutral phosphate (made soluble).....	5 05	× £21 = 120
Insoluble phosphate.....	3 85	× £8 = 32
Hydrated sulphate of lime.....	£3 29	× £1 = 23
	100 00	
Ammonia.....	0 50	× £60 = 30
		1,00, £2, 19
		20
Value £2 4 per ton.		3 80

V. VALUATION OF ADULTERATED GUANO\*.

	Value per Ton.	Total.
Moisture .....	5 10	
Organic matter, &c.....	20 55	× £1 = 21
Sand.....	49 30	
Oxide of iron and alumina.....	5 46	
Phosphate of lime.....	16 25	× £8 = 1 3
Carbonate of lime, &c.....	3 04	
	100 00	
Nitrogen (equal to).....	4 65	
Ammonia.....	5 64	× £60 = 3 60
		£5, 09
Value £5 per ton.		

VI. VALUATION OF A SUBSTANCE LATELY INTRODUCED INTO COMMERCE, CALLED "MEXICAN GUANO."

	Value per Ton.	Total.
Moisture .....	3 24	
Organic matter, &c.....	13 53	× £1 = 14
Silica.....	0 60	
Phosphate of lime.....	25 60	× £8 = 208
Carbonate of lime.....	46 14	
Sulphate of lime, &c.....	10 36	× £1 = 11
	100 00	
Nitrogen (equal to).....	0 21	
Ammonia.....	0 26	× £60 = 15
		1,00, £2 43
		20
Value £2 9s. per ton.†		9 60

The foregoing examples show how very closely the rule brings out all the actual value of the various samples. It is necessary, however, to remember that circumstances might possibly arise in the course of time which would render some alteration requisite in the amounts of our multipliers of value. At the present period, however, they are sufficiently true for every practical purpose.

As to moisture, I need scarcely tell you that that is worth nothing. Let me here remark, in passing, that farm-yard dung generally contains from 80 to 85 per cent. of water, and of course, therefore, the farmer who puts 100 tons of farm-yard dung upon his land does not put upon it more than from 15 to 20 per cent. of solid matter—that is, of the matter in which all

the virtues of the manures consists. Now, gentlemen, as I have before intimated, it is very difficult to compress all the matters which I desired to bring before you within the compass of one brief lecture. I can only say, in conclusion, that I am exceedingly obliged to you for the very kind and attentive manner in which you have received my remarks this evening, and that if after I have sat down, there should be any points on which you wish to obtain from me additional information, I shall be very happy, if possible, to afford it (cheers).

The CHAIRMAN said he concurred in almost everything the lecturer had said. He saw considerable doubt depicted in the countenances of some gentlemen present while Mr. Nesbit was explaining the system of cutting clover twice and relying on the decay of the clover-roots for manure for a wheat-crop; but he had himself said, in the presence of four or five persons whom he met this morning, and without knowing any opinion of Mr. Nesbit, nearly word for word what they had just heard on that subject. He had found that in other parts of the country clover was the crop that preceded wheat; and any one who would take the trouble to examine carefully when he ploughed up clover, would perceive that the abundance and size of the roots were likely, when in process of decay, to afford to the wheat-crop a large quantity of valuable manure. The only question was, whether the moisture of their climate might not prevent the roots of clover from producing the same effect that they produced in other parts of the country (Hear, hear). Of that he could form no opinion.

Dr. DERRY PEARSE said he wished to put a question to Mr. Nesbit. He wished to know what was the nature of carbolic-acid—an acid mentioned in a pamphlet which he met with, the other day, "On the preservation of natural manures," by Alexander M'Dougall, who spoke of it as one of two acids, the other being sulphuric acid, and the bases magnesia and lime. On first seeing the term "carbolic" he was disposed to conclude that it was a misprint; but it afterwards appeared that that was not the case. It was stated that by the agency of this compound the noxious principles were removed, and the valuable ones preserved. It was of course very important to obtain a perfect deodorizer, which this agent appeared to be, while its value was alleged to be increased by its not exerting any detrimental action upon those elements which farmers wished to preserve. He might thus illustrate the benefit to be derived from a good deodorizer. A stall-fed cow would void 15,000lbs. of urine in a year, which would yield 240lbs. of ammonia, in addition to the phosphates of the urine and all the other excrements. Of this 240lbs. of ammonia no less than 162lbs. were annually lost by the ordinary mode of treatment, or rather neglect, of the urine. Ammonia could not be purchased by the farmer for less than 6d. per lb. 162lbs. of ammonia at 6d. was 81s., the annual value per head for stall-fed cattle of the manure lost from the urine alone. The loss on the other excrements was proportionably great. This 81s. worth of ammonia was dissipated in the air, generating disease and impoverishing the soil.

Mr. NESBIT said there certainly was such a substance

\* Often sold as Peruvian Guano, a pound or so under the market price, to farmers who are in want of—A BURGAIN.

† This value is, however, practically lessened by the large quantity of carbonate of lime contained in the sample. Yet this substance has actually been bought by farmers as guano, at from £3 to £9 per ton.

as carbohc acid. His opinion of it was, that however valuable it might prove when used on a small scale, it was utterly impossible to use such a substance or combination on a large scale. It might be employed, perhaps, with advantage in a gentleman's stable; but he would not recommend Cornish farmers to resort to it for the purpose of arresting the ammonia in their dung, for the simple reason that the quantity which would be required could not be produced. Moreover, every farmer had at his own door the most valuable of all deodorizers, in the shape of common earth. When the dead were buried out of their sight, all the products of decomposition were absorbed by the earth; and when there was such a ready resource at hand for arresting the odours emitted by manures, he could not advise them to have recourse to any expensive means of securing the same object, even if it were available to a sufficient extent.

Mr. R. WISE was desirous of putting to Mr. Nesbit a question having reference to his remarks on the subject of clover. In that neighbourhood it was the practice to eat down clover; and there was, he believed, a clause in all the leases prohibiting the cutting of clover twice in succession. He would be glad to hear from Mr. Nesbit whether or not his remarks were applicable to the laying down clover for two years.

Mr. NESBIT said he knew that was a question which admitted of a great deal of argument. He was aware of the practice of laying down clover for two years. But they lived in too enlightened times to follow the practice of their ancestors, merely because it was their practice; circumstances might have arisen which required that they should deviate from it. For example, their ancestors did not use artificial manures to stimulate the growth of their crops; and hence, in their wisdom, they laid down the ground for a certain number of years, in order that vegetable matter might accumulate there. It was in this way that he accounted for the prevalence in that county of the practice of laying down seeds for two or three years. He thought it would be worth while to ascertain by experiment whether one year would not suffice; whether, by means of a sort of modification of the four-course rotation, they might, in four years, obtain a better return than they had done under the present system. (Hear, hear.)

The Rev. E. PHILLIPOTS observed that the agriculturists of that neighbourhood were in the habit of seeding out, not only with clover, but also with some of the other grasses. He would be glad to know whether or not that practice interfered with the application of the principle laid down by the lecturer.

Mr. NESBIT said, the grasses generally did not enter so largely into the question as clover. He had been speaking more particularly of clover. The grasses were not of the same race as clover; and, not having so large an amount of roots, did not follow exactly the same rule. When they were laying down a regular pasture, of which clover would form only a small portion, the principle which he had laid down was not applicable to quite the same extent that it was in the case which he had supposed; but still it was applicable to this extent, that it would not answer to feed with

clover unless they were laying down the land for a great number of years, and even then it would be better to let the clover grow for a certain time than to let it all be fed off as it was produced. They could keep a much larger quantity of animals by that means, than by allowing the stock unlimited access to the pasture.

The CHAIRMAN said, a gentleman had remarked that he thought the leases in that neighbourhood contained a clause which prohibited the cutting of clover twice. The gentleman was quite right; such a clause was always inserted, and it was important to bear that in mind in discussing this question.

The Rev. Mr. MAY thought it might, in some cases, be desirable to feed sheep on half the crop, and to cut and plough-in the other half.

Mr. NESBIT said, what he had been advocating was, the allowing the clover to be fully developed before it was either fed off or cut. To cut it completely, and then allow it to develop again, would certainly be preferable to continuous feeding; but by ploughing-in both the top and the bottom growth they would of course obtain the greatest result in the after-crop. The best course to be pursued depended to a great extent on the amount of vegetable matter in the soil. The plan of letting clover acquire very large roots might not always answer on some peculiar descriptions of light land, a certain mechanical compressed condition of the soil being required in exceptional cases. He knew that Mr. Hudson, of Castleacre, found that it would not do for him, in certain cases, to cut clover twice, because his land was too light.

Mr. R. WISE said, he had dressed some clover, just after the barley was cut, so that it was protected all through the winter. He grew two tons of hay per acre on very poor land. He laid it down for permanent grasses, and he found it answer very well.

The CHAIRMAN: There was a top manure afterwards?

Mr. WISE: Yes.

Mr. PROUT, of Lifton, observed that there was a great prejudice in that neighbourhood against the use of superphosphate of lime instead of bones, it being imagined that the quality of the bones was greatly injured by the action of the vitriol. He should like to hear the lecturer's opinion as to the best and most profitable mode of applying bones to the soil.

Mr. NESBIT said he considered Liebig's suggestion as to the use of oil of vitriol, in dissolving a portion of the bones, one of the greatest hints ever thrown out to practical agriculturists. It must be remembered that while bones were in their natural state, the plant could not act upon the inside, it could only act upon the outside; the inside of the bones was of no more use than if that portion were not in the land at all. The more finely bones were powdered the better was likely to be the result. He believed that farmers were fond of half-inch bones, because, not being supplied with microscopic eyes, they could not otherwise tell of what the article consisted (laughter); but, in whatever form bones might be supposed to be applied, the chemist could tell what they really were, and whether or not there was anything mixed with them. So that the farmers had

powerful magicians at their command—magicians of far greater might than the Cornish demons of former times, or even Merlin or King Arthur of the Round Table himself. Dissolved bones were soluble in water. The first rain that came sent what was soluble to the roots of the plant; and if there were in the soil a certain proportion of insoluble bones, or bones which had not been dissolved—as ought always to be the case—the soluble part would probably suffice to carry the plant past the fly. He considered it of very great importance to agriculture that a certain proportion of the phosphates should be soluble, whilst another portion should be presented to the plant in a state not quite so soluble.

A gentleman wished to know what Mr. Nesbit thought of grinding bones to powder.

Mr. NESBIT: It is a very good plan.

Dr. PETHICK said there were two or three questions which he would take the liberty of putting to the lecturer. The first question was, whether, in the application of bone-dust as a manure, it was not better that it should be applied on the surface, and harrowed in, so as to secure the free access of air to favour the decomposition of it, instead of being, according to the prevailing method, turned entirely under the furrow? Secondly, he wished to know whether ammonia existed at all as ammonia? his opinion being that the ammonia which was evolved in the decomposition of organic substances was generated at the time that decomposition was going on; the nitrogen and hydrogen in the act of flying off having a strong affinity for each other, and then chemically combining and forming ammonia. Ammonia being nothing more than a compound gas formed of nitrogen and hydrogen, was it requisite that they should apply to the soil artificially that which was so abundantly supplied by nature? Had not plants the means of obtaining from the atmosphere all the nitrogen, and from the water in the soil all the hydrogen, essential to their development and perfection? Again, the lecturer stated that land was less injured by a double cropping of clover than by being frequently eaten by sheep and cattle; since, with the growth of the plant above the soil, there was a corresponding increase of roots beneath, which roots afforded a large supply of manure for the succeeding crop. Was not the effect of carrying off a large amount of alkalis and phosphates in the two crops of clover more than any equivalent afforded by the accumulation of roots? and was the carbonaceous matter produced by the roots at all required by the wheat grown after the clover, seeing that, according to the lecturer's statement, the atmosphere would afford in the form of carbonic gas all the carbon the plant would require?

Mr. NESBIT said the first question was whether it was not desirable that bone-dust, when applied as a manure, should be applied on the surface, and not ploughed in too deeply. His reply was, that it would be the best not to plough in the bones too deeply, because they would not in clay soils of this district decompose quickly; but with decomposed manures the question might be different. The more the bones were exposed to atmospheric action the better, and that was the reason why it should be as finely powdered as possible. The

second question was, whether ammonia existed at all as ammonia in farm-yard manure? Ammonia certainly did not exist as such in a piece of straw; but as soon as the straw began to decompose, ammonia was produced, a portion of the nitrogen and hydrogen of the straw or other decomposing matter uniting together to form ammonia, while the carbon and a portion of the hydrogen united with the oxygen, producing water and carbonic acid gas.

Dr. PETHICK: In the act of evolution?

Mr. NESBIT: Yes; and if the decomposing and oxydising action of the oxygen went sufficiently far, the ultimate result would be nitric acid, eventually produced from the nitrogen of the vegetable matter. Then with regard to the last question, he must remark that he spoke from practice, and not from theory alone, in what he said about clover crops. With respect to the question of whether plants could obtain from the air all their nitrogen, there was no doubt that some plants could obtain all they wanted from the air, but that others could not, at least in the quantities essential to produce the abnormal crop required by the farmer to pay his rent and taxes. As to the supposed abstraction of the phosphates by the clover from the soil, it must be recollected that what was in the hay was brought back again as manure, and therefore there could not, under proper management, be any robbing of the farm. Had he been speaking of the exportation of farm-yard produce the objection would be applicable; as it was, it fell, he conceived, to the ground.

Mr. GEAKE would be glad to know whether the Professor could recommend any simple test by means of which the farmer could ascertain for himself the purity or impurity of manures?

Mr. NESBIT thought it perfectly impossible to do so. The great point for the farmer was to take care that he dealt only with those dealers who had something to lose, that was to say, a character (Hear, hear.) He could give them no other test than that. If they wished to go further, they must either learn chemistry themselves, or they must entrust to others the task of analyzing for them.

Mr. HUXHAM wished to inquire of Mr. Nesbit whether salt would be a good addition to manure, and whether it were not desirable for farmers to have their soils analyzed before applying artificial manures to them. With regard to the breaking-up of clover for wheat, a friend of his had told him that he had tried the experiment, and the result was that for some time the thing answered well, but that after a time the clover did away.

Mr. NESBIT said he believed the application of salt to be very useful in increasing the strength of the straw and the delicacy of the grain. There could be no doubt that salt ought to be used for grain crops. Even so near the sea as Launceston was situated, the application of three or four cwt. of salt per acre for grain crops must prove beneficial, and there should be a smaller quantity for mangold-wurtzel and other root crops. As to the analysis of soils previous to the application of manures, no doubt it would be well to know the nature of the soils in different parts of the kingdom, but at

present he thought it was more desirable for them to consider what crops they should grow than the nature of the soil. The analyzation of soils often reminded him of the man who, having a house to sell, came with a brick in his pocket as a sample of the house (laughter). They had to consider what drains there were in the soil, and what was their direction, what subsoiling there had been, and so on. There might be almost fifty kinds of soil in the same field. The question, What was the nature of the soil of any particular farm? was, in fact, a complicated question; and, with one exception, he thought the farmers of the present district had better confine their attention to the crops which they had to grow. The exception to which he referred had reference to lime. It was very easy to ascertain whether there was sufficient lime in the soil: if there were not, lime should be supplied; if there were, it would not be of the slightest use to add more.

A GENTLEMAN said, that as it was now generally understood that plants derived their nourishment partly from the soil and partly from the air, he had often been puzzled at finding that the mangold with a small top was generally the largest.

Mr. NESBIT observed that that fact was very easily explained: there was such a thing as over-manuring. This would produce a large amount of foliage and a great development of the cellular tissue of the plant; and if the season should not be favourable, the plant would not fill up the cells with the proper amount of starch, sugar, or other similar materials. The large amount of foliage would have produced a large root had the circumstances been such as the plant required.

Mr. HUXHAM wished to repeat that a friend of his, who sat near him, stated that some wheat which he sowed after clover, in a light soil, did exceedingly well for a time, but that the benefit afterwards died away, and eventually the crop was not half so good as it had been.

Mr. NESBIT said it was impossible for him to state exactly what was the cause of that. It might be the wireworm, or some Cornish insect with which he was not acquainted. He could not undertake to give a recipe for every evil in the soil. (Hear, hear.)

The CHAIRMAN said, the time having come for terminating the discussion, he wished to make one or two observations before they separated. With regard to clover—in the management of which he took very great interest—he confessed he still entertained some doubts

whether what Mr. Nesbit recommended would answer in the West of England, on account of the moisture of the climate, which was better adapted for grass than for grain; and whether, in fact, the clover-root manure might not make more straw than grain. The experiment has never been fairly tried in the district. It must be borne in mind that in that part of the country clover was what he might call the last crop. Wheat, barley, turnips, and barley had been taken from the land before they put into it clover. To make the experiment fully, he thought nothing but clover should be sown with the barley, and then some lime or other manure should be given to the land. The lime, acting on the roots of the clover, would contribute to the kerning or forming of the grain, and in that way, perhaps, counteract the tendency of the land to produce straw rather than grain. At all events he hoped the experiment would be fairly tried. There was another point which occurred to him. The lecturer recommended that, in forming a dung-heap, the dung should be laid several feet thick, and that it should be covered with earth, which he said was the best deodorizer they could possibly have. That is, no doubt, true; but then another question naturally arose, whether there is any occasion for a dung-heap at all. This question might startle the farmer, who prided himself on his dung-heap; but still he repeated, it was worth while to consider whether it would not be better, after all, to cast the dung direct to the land, and thus prevent any escape of what in the discussion they had heard so much about, viz., ammonia. Now, he was sure that all present were very much gratified by the lecture which they had heard that evening; and he hoped that the Launceston Agricultural Society would be enabled to secure the attendance of Mr. Nesbit on some future occasion, when additional information would, no doubt, be imparted. Such lectures as that to which they had just listened was, at all events, adapted to set agriculturists thinking. And he hoped that many of those present would ponder what they had heard, make experiments, as far as practicable, in connexion with his suggestions, and communicate the results to the Society. In conclusion, he would, on behalf of the audience, thank Mr. Nesbit for his lecture, and express a hope that that was not the last time they would see him amongst them (cheers).

The meeting then separated.

## DRAINING CLAY SOILS.

BY CECIL.

The active preparations now in progress in various parts of the country for the important operation of draining wet soils are suggestive of a few remarks on the subject.

When the highest authorities are at issue upon a principle, it appears in a majority of examples difficult to determine which party entertains the most correct

opinions; and concerning the most effective methods of draining land, much argumentative power has been expended. On the present occasion it is not necessary to investigate all the points upon which these antagonistic views have been established. Many have no doubt founded their opinions upon personal experience—that experience having been confined to soils of similar cha-

acter. My present object is to suggest a remedy applicable in certain cases, in order to overcome an obstacle which has hitherto imposed many difficulties.

I must, however, premise that there is an opinion that the minimum depth at which drains should be laid must not be less than four feet, irrespective of the quality of the land, whether it be an almost impervious clay, or a soil in which the property of percolation is more free. This view has received the sanction of the Inclosure Commissioners in reference to capital borrowed for the purpose of draining, and charged in perpetuity on the inheritance. It has consequently assumed a character of importance to owners of estates requiring to borrow money for draining, and, I may add, to the public at large.

I have seen so many examples of total failures where drains have been laid at this depth in strong clays, that I have been induced to give the subject much consideration. It frequently happens that deep drains in clay soils will act for a space of time—that is, so long as the earth with which the drains are filled lies hollow on the tiles, and this period will be governed by the state of the weather. When the land has become saturated with rain, and has undergone the changes to which it is subservient under the combined influences of expansion, contraction, and pressure, produced by variations of the atmosphere, the clay resumes its pristine impervious consistency, and the drains although they may emit water are comparatively useless. The kind of soil to which I allude is that which presents a strong tenacious clay on the surface, with a continuation of a similar quality to the depth of several feet, on which the impressions made by the feet of horses and cattle during rainy periods will retain the water like a cup. This kind of land is far more difficult to drain than the strong marl, which is by many denominated clay; for that kind of surface although resting on clay may be drained with comparative facility, and the efficiency of the drains will be more permanent. The object to be attained by draining the description of land now under consideration, providing it is not affected by springs, the courses from which are beneath the upper stratum, is to draw off the water which descends in the form of rain, with as much rapidity as possible—a difficulty in consequence of the nature of the soil; but unless this be accomplished the work is not perfect. It affords no proof that the land is effectually drained simply from the fact that water is found to pass off by the drains. The questions to be decided are these: How long a time does it occupy for the water to percolate through the soil into the drains? and does the land become sufficiently dry after rain within a reasonable period? On clay soils the percolation of water to the drains is extremely slow, and the reasons I have already explained. For the purpose of overcoming this difficulty my attention has been directed to discover some suitable material for filling up the drains as a substitute for the nearly impervious clay which in their formation is removed. This I believe may be effectually accomplished by submitting that clay to the process of burning, according to the plan for many years adopted in Shropshire and the adjoining counties for the purpose

of dressing the land and rendering it more friable. A similar system on an extensive scale is likewise practised on railways to produce what is termed "ballast," used as a substitute for gravel. To carry out my plan it will be necessary to lay a foundation at the bottom of the drains of six inches of the burnt clay, and after making it perfectly level with a wooden beater about two feet long and of a proper width to fit the drain, place the tiles thereon and cover them within ten or twelve inches of the surface with the same material, thus forming veins for the free percolation of water. The effect obviously produced will be that of introducing a material capable of very free percolation, as a substitute for a very impervious substance. I have not yet seen the plan tried, nor even heard of its having been adopted; but as draining operations are now in progress, I lose no time in giving it publicity. My motive for offering the opinion is with a sincere hope that the suggestion will be effective, and that it will be fairly tried in numerous instances, also that the results will be made known, because a few experiments of this nature are not sufficient to decide the question.

It may be urged that it will increase the expense, which must be admitted; but if it renders the drainage effective, of which I have but little doubt, that is a great point gained. Strong clays cannot be satisfactorily drained at a cheap rate, except in a few cases, upon any system hitherto discovered. The drains must be placed nearer together than in soils which percolate with greater freedom. Providing the plan succeeds where deep draining is insisted upon, it will be equally desirable with soils of the nature now under consideration, where shallow drains or those of medium depth are adopted. In offering the suggestion it is not done with a view to advocate deep draining in strong clays, of which in ordinary cases I entertain but one opinion—that according to the common practice it is positively useless, and as it involves a great outlay of money to be buried in perpetuity, few who are in the happy position to defray the charges from their own resources, and to judge for themselves, will, I should imagine, persevere with the system.

The principal difficulty appears in the event of much rain falling at the time the clay is required to be burnt; but this may be obviated by forming the heaps of greater magnitude; and with reference to the expense, it is to be remembered the clay will be at hand, and no expense incurred for hauling, with the exception of the faggots and coal required for the purpose.

UNIVERSAL EXHIBITION OF HORSES.—The French Government has just decided that prizes shall be offered for the competition of horses of all countries at the great French Agricultural Exhibition of next year. It will be remembered that Mr. Evelyn Denison, M.P., the President of the Royal Agricultural Society, in his report on the Exhibition of 1855, and likewise in his speech at the Chelmsford meeting, expressed his regret at the absence of so interesting a department of the show as that of agricultural horses. This decision of the French Government, and the other new features intended to be added to next year's meeting in Paris, will materially tend to render that great gathering even more numerous and magnificent than its predecessors.—*The Veterinarian*.

## RAPE-CAKE AS FOOD.

DEAR SIR,—Having on various occasions appeared as an advocate of rape-cake for food, in the use of which I have had considerable experience, I beg to offer some remarks on Dr. Voelcker's paper on oil-cakes as recently published. I agree with Dr. Voelcker's observations that it is unsafe to attach a precise value to different articles of food; we well know that well-got hay is very different in composition and also in effects from spoiled or inferior hay—a remark equally applicable to other materials; in assigning a value to such substances we include only those of good average quality.

It is about six years since I began the use of rape-cake for food. After various trials for fattening, and also for milk, I gave up the use of linseed-cake altogether, being fully persuaded that in point of economy for both purposes, rape-cake had the advantage. In regard to milk, I was convinced that rape-cake afforded quite as much in quantity, but had not then observed any difference in the quality.

When I first gave an order to the manufacturer with whom I deal for rape-cake for feeding, he required time to prepare it: his object was to enable him to select seed free from mustard or other impurity. On one occasion only have I had from him cake of which I had reason to complain, and on that I sent for a small supply towards the close of the season without previous notice.

I now proceed to notice Dr. Voelcker's objections *seriatim* :—

1. Before I commenced my present process of steaming the cake together with bean-straw, malt combs, or other substance rich in aroma, I had some difficulty in persuading my cattle to eat rape-cake; by perseverance, however, I invariably succeeded. In my present practice (by steaming) I find no such difficulty; I can as readily accustom them to eat rape-cake as I formerly could linseed; many of my cows have become so partial to it that they sort it out from amongst the materials with which it is blended.

2. I do not at all object to rape-cake when kept for six or twelve months. Before I commenced steaming I found my cows refused cake when quite fresh, whilst when kept a few months, the same cows eat it readily; it becomes milder and more tender (easier to masticate) by keeping. To preserve it from mould I cover it with rough seeds (shells of oats) which have been kiln-dried; saw-dust or chopped straw, if dry, will equally answer the purpose. Since I began steaming I find no objection to its being given fresh; I am led to think that this process affects the essential oil, renders the taste milder, and the cake easier of mastication, besides which the flavour of the bean-straw or malt combs will in some degree be imparted to the cake.

3. In regard to the objection of a greater proportion of woody fibre in rape than in linseedcake, it would be of easy remedy to feeders who, like myself, use turnips or other roots in limited quantity (I never give more than 50 to 60lbs. each per day), by allowing 8lbs. of turnips per day, or 56lbs. per week in addition. If we take 5lbs. per day, or 35lbs. per week, which I hold to be the maximum allowance of cake or other food rich in albumen per beast, and reckon 10 per cent. of woody fibre more in the rapecake than in the linseedcake, it will amount to 56 oz. for the week, whilst the 56lbs. of turnips supply 82 oz. of sugar, starch, &c. If we assume the price of linseedcake at £4 10s. per ton higher than that of rapecake,

this on 35lbs. will be about 1s. 5d., whilst the 56lbs. of turnips at 10s. per ton will only cost 3d. Swede turnips contain also about 15 per cent. (reckoned as dry) of albuminous matter, which is, doubtless, the most valuable component of food, whether we consider it assimilated in fibre or as an ingredient of manure.

A pound of lean beef, say rump-steak, will cost 9d., reckoned as dry, without moisture, equal to 3s. per lb.; a pound of suet at the same time will cost 6d. to 7d.; suet or other fat is almost free from moisture. Nitrogen is known to be the most valuable ingredient in manure, whilst sugar, starch, &c., have no ascertained value whatever.

I would not be understood to adopt the teaching that substances used as food are efficient for fattening in proportion to their greater per centage of nitrogenous compound. I hold such doctrine to be untenable.

4. As to the more frequent adulteration of rapecake as compared with linseed, this might reasonably be expected so long as it was sold for the purpose of manure only, mustardcake being but slightly inferior to rapecake for this purpose. But at present a higher charge of £1 to £1 10s. per ton being made for rapecake for feeding as compared with that for manure, I should hold the vendor responsible for supplying me with genuine rapecake.

If the experience of the best stock farmers shows that linseed is more efficacious for fattening than rapecake, I am inclined to think this attributable rather to the quality of the oil than to the properties noticed by Dr. Voelcker.

In the composition of feeding substances we discover as proximate elements albumen, legumin, gluten, protein compounds—all very similar in chemical composition, but differing somewhat in form and solubility. We find also sugar, starch, gum, dextrine, agreeing with and differing from each other in like manner. We find also oils, a distinct class of substances with peculiar and varied properties; they consist of two varieties, the unctuous represented by rape, and the dry by linseed oil. Hitherto these oils have obtained no distinction in agricultural chemistry, but I entertain a strong persuasion that in the animal economy their effect is different. These oils consist of proximate elements, olein and stearine, or margarine fats; in what proportion I have not been able to ascertain. In a small volume kindly lent to me by Mr. Wilson, the scientific director of Price's Candle Manufactory, I find a popular treatise on the preparation of manufacture of oils by Fontenelle, which supplies interesting statistics derived from the researches of French chemists, who appear to have given more attention than our own to the properties of oils or fats.

The unctuous class of oils—olive, rape, &c.—are found to congeal at a temperature of about 32 degrees (freezing point), some at a little higher, others at a little lower degree. Linseed and other oils of the drying classes require a degree of cold 47 d. 30 m. below freezing point, or 17 d. 30 m. below zero, to effect their congelation.

Fontenelle supplies only analyses of a few of the oils, showing their composition in olein and stearine—

Olive oil is found to contain of olein. . . . .	72
" " " " " " " " of stearine. . . . .	28



Rape oil is found to contain of olein . . .	54
"                    "          of stearine . .	46
	100

Fontenelle does not supply the composition of linseed oil. An analysis of linseed, cotton, and other oils, which are to may be used for feeding, seems highly desirable.

The olein fats require but a low temperature to melt or liquefy them; whilst the solid fats, margarine and stearine, require a temperature of 120 to 130 degrees for the same purpose.

Linseed contains a great portion of mucilage, and on being dissolved in water forms a stiff jelly.

Lehman, in his "Physiological Chemistry" (a translation of which by Dr. J. Day, F.R.S., has been published by the Cavendish Society), a work displaying great research, a copy of which I have been unable to obtain except for a short time on loan, states that the olein is known to be more easy of consumption, *i. e.*, more available for respiration, than margarine, and thus accounts for the fat of animals being more of the solid (margarine and stearine) than the oil of plants, which contains a considerable portion of olein.

The practitioners in medicine are now using extensively pure cocoa-nut olein for pulmonary complaints, in lieu of cod-liver oil. I propose shortly to occupy your pages with the treatment of pleuro-pneumonia, in which I have used cocoa olein with apparent advantage.

Those of your readers who peruse the Royal Agricultural Society's Journal will have noticed the peculiar results of my dairy practice from cows treated with rape-cake as part of their food, showing a more than ordinary produce of butter in proportion to milk, and a still more extraordinary richness of cream. On examining my food I could discern no material so likely to account for this peculiarity as the rape-oil, accompanied by an adequate supply of albuminous matter.

I have from time to time held conversations with stock feeders possessed with information beyond the reach of prejudice, who state that after comparative trials they had come to the conclusion that linseed-cake was more effective for fattening than rape-cake. These considerations, together with the persuasion that food rich in albumen is, generally speaking

too freely given for fattening, have led to a change in my mode of feeding. I am now using as extra food, together with straw, and a limited supply of turnips or other green food—

2½ lbs. per day of rape-cake . . .	} Steamed with the straw.
1 lb. per day of malt combs. . .	
½ lb. per day of linseed oil . . .	

The ½ lb. of linseed-oil represents the quantity contained in 4lbs. of cake. The oil alone costs £40 per ton; whilst in cake, reckoned as oil only, it costs £88 per ton; the cost of linseed-cake being £11 per ton, having 12½ per cent. of oil. The whole of these extra ingredients of food cost 3s. 1d. per week each. This practice was begun in the autumn of 1855, on 30 beasts. Their increase was very satisfactory till December and January, when they were sold off to Mr. Wilson, of Bradford, who reported them of prime quality, with a great deal of loose fat.

In the spring of this year, I observed the like treatment on 30 heifers, but without any roots or hay from March to July, when they were sold to different parties, who, as far as I have learned, reported favourably of them. The average gain was 14lbs. per week each. One of the lot gained 2½lbs. per week throughout the course of 16 weeks. She cost £11 at the Easter fair, and sold in July for £18 10s. In my experience as a feeder, I have not had an instance of a like gain. It will be observed that these cattle were without a particle of roots or other green food during a part of March, the whole of April, and a part of May. I am at present treating 30 for fattening in like manner, with some addition of green food. Their appearance and weighing denote a very satisfactory improvement.

The readers of your Journal will be pleased to accept some portion of these statements as conjectural rather than ascertained. If, in offering them for publication in your pages, I succeed in engaging the attention of Dr. Voelcker and other teachers of agricultural chemistry, and also of those who, like myself, are seeking to apply the rules of science to economize their practice, I shall attain my object.

I am, dear sir, yours truly,

THOMAS HORSPALL.

Burley Hall, Otley, Nov. 28, 1856.

## THE WOOD TRADE OF DANZIG.

OFFICIAL REPORT OF THE WOOD TRADE OF THE PORT OF DANZIG FOR 1855.

BY CONSUL GENERAL PLAW.

The wood trade of Danzig had no rivalry to fear this year from St. Petersburg, Riga, Wiborg, and other Russian ports; but the contrary was the case with regard to Sweden and Norway. From these causes prices, especially of pine timber, in England, France, Holland, and Belgium, were not higher than in the year 1854.

With the exception of about 30,000 very fine balks from Volhynia, the majority of timber consisted of middling quality, and but short average lengths.

MASTS AND SPARS.—About 7,500 were imported, and most part of excellent quality; a large number of which was sold for the English and French navy yards. There were shipped—

To Britain . . . . .	5,245 pieces	—3,900 more than in 1854.
To France . . . . .	4,622 "	2,084 "
To other countries . .	565 "	289 "

Among the spars were some fir, which came from the Eastern Provinces of this country, and went to France.

DECK DEALS and deals for the English and French navy, as well as for private trade, were much in request, but the advance of prices was only small. 460,897 pieces were

exported: 39,272 more than in 1854. 476,811 SLEEPERS were shipped, the demand larger than could be supplied: this number is 95,740 less than in 1854.

### OAK PLANK.

40,642 pieces arrived . . . . .	17,281 less than in 1854.
49,282 " were shipped . . . . .	8,458 less "
57,152 " were cut here . . . . .	2,915 more "
31,413 " in stock remained, 2,158 less "	

### OAK, STRAIGHT AND CROOKED TIMBER.

23,919 pieces arrived . . . . .	4,778 less than in 1854.
21,472 " were shipped . . . . .	4,931 more "
29,379 " in stock remained, 4,416 more "	

### OAK STAVES.

12,189 shoeks arrived . . . . .	12,783 less than in 1851.
11,575 " were shipped . . . . .	1,213 "
about 22,100 " in stock . . . . .	2,400 "

WAINSCOT LOGS.—1,490 pieces received; 62 pieces only shipped.

LATHWOOD.—5,247 fathoms were shipped: 113 less than in 1851. This article was in great request, not sufficient quantity having been worked.

## THE BIRMINGHAM AND MIDLAND COUNTIES FAT CATTLE AND POULTRY SHOW, AT BIRMINGHAM.

The Birmingham Show at any rate deserves success; not merely for the excellence of the arrangements, or the judicious spirit with which every feature of the meeting is conceived and carried out; but above all for the readiness with which the management gave way when they found their own plans as originally determined upon, would interfere with those of a kindred association. The "Midland Counties" has now for some time had a position sufficiently high to warrant its holding to its own course. Had this still been pursued, although not invariably the case, the meeting would again this year have clashed with the Smithfield Club. With a very good grace, however, Birmingham has been the first to avoid so unprofitable a collision; and with an effect that must for ever prevent any such a *contractemps* again occurring.

The Midland Counties' show of this year is generally pronounced to be the best ever seen. In its average strength this is very perceptible, while the advance in some certain classes is altogether extraordinary. It is of course sufficiently manifest that this must in a great measure arise from the alteration in the time of meeting, to which we have referred. As we take it, moreover, any such improvement will be by no means confined to Birmingham. We expect to find at the Smithfield Show of this ensuing week as palpable proof of the mutual advantage following from this due accommodation of circumstances. For instance, the majority of the prize animals will go direct from one meeting to the other—Mr. Stratton's Shorthorns, Mr. Heath's Herefords, and the Prince's Devons. What the Smithfield Club chiefly requires is these preliminary shows to *feed* into it. They never could have happened better than they have on this occasion. We have the Gloucester, the Rutland, and above all the Midland Counties well over by the great Metropolitan Anniversary. In these railway times such an arrangement gives everybody the best opportunity of making the most of what he has to do. Buyer, seller, or simply spectator, each of us must profit proportionately. For the breeder or feeder, more particularly, who has any conceit in his stock, there is nothing like these consecutive entries. Mr. Stratton's first prize ox at Gloucester was the first prize at Birmingham. His Short-horn cow again was the first at both these meetings. It only remains now to see how they rank at the Smithfield Club.

Notwithstanding the fact expressed in the Gold Medal award, it is no less certain that of the three long recognized breeds—Shorthorns, Herefords, and Devons—the Shorthorns were, as a class, inferior to what they have been. Mr. Stratton's are both famous animals—indeed had the white ox filled out a little more level, he would rank with

those specimens one can call to mind long after their show-year has passed away. Still the Durhams, generally, scarcely reached that high character now obtained for them. It was thought, in Bingley Hall, we had been sending too many of the best out of the country, and that the purest kinds were becoming gradually reduced. For our own part, however, we are the rather inclined to attribute this falling off to some accidental combination of circumstances for which there is no exactly accounting. The breed is too well established amongst us to suffer long from any occasional run upon it; but it will make one look with additional interest to the way in which the Short-horn is represented at Smithfield.

The Birmingham Shows have always been strong in Herefords and weak in Devons. When you could scarcely find the Hereford anywhere else, he always came out in force here. With the Devons it has almost invariably been the contrary. But at length this is amended. The Herefords were as good as ever. There were whole classes of prize animals. In the first, for example, of the four animals sent, one took the first prize, another the second, and a third was *highly commended*—this third being bred by Lord Berwick and fed by Mr. Heath. The gold medal Hereford cow, again, was quite a wonder, in her way, as a fat animal; and Lord Hatherton's steer a noble specimen of the breed. It was thought, not long since, that the Herefords were growing out of date, but they appear coming again very fast; while, if increased entries and remarkable quality be any criterion, the same may be said of the Devonian. We hardly ever remember to have seen so strong a show of Devon cattle as was to be found at Birmingham this year. The oxen and steers were especially good; and either the Prince's ox or Lord Leicester's steer might have put in a claim for the Gold Medal of the show. It is, indeed, remarkable that three animals were "pulled out," as the term is, by the judges, as worthy of this extra distinction—Mr. Stratton's Shorthorn, Lord Hatherton's Hereford, and Lord Leicester's Devon. This is the first time, we believe, a Devon ever came so close on the chief honours at Birmingham. But Lord Leicester's is an admirable animal, most symmetrical in form, and fine in quality. He is, too, one of the most evenly-fed beasts ever exhibited; and with another year's keep, which we are told he is to have, he will have another good chance for the highest place.

As our readers will find a close analysis of the stock shown following the prize list, we shall not here repeat ourselves. We may say, however, that, although the premiums for Long-horns, a breed now peculiar to these shows, have been judiciously curtailed, the whole class was commended. While, we may add,

on the word of a Warwickshire man, that nearly every Long-horn bred finds his way to these shows. There were five of them here. Of Scotch cattle, the rough Highlanders had it all their own way; and of Welsh, despite the attractions of a separate class, there was but one beast, the property of Colonel Pennant, which, however, very deservedly took the prize. The Colonel had another entry—said to be the finest Welch beast ever put up; but this, unfortunately, died of inflammation, within a few days of the meeting. We should certainly like to see more of these mountaineers, either Welsh or Scotch. In the market, with the salesmen and butchers, they have the call for quality over all other sorts; though it is yet a disputed point as to which is the superior of the two.

Of the crosses the most remarkable were those sent by Lord Derby—the Brahmin with the shorthorn, and the Brahmin with the Galloway. The latter, we hardly know why, was commended as good of its kind; while the Brahmin-shorthorn appeared to have attained the great desiderata of extreme narrowness of frame, with extraordinary length of leg. Like the fan-tailed pigeon, or the Cochín-China cock, he took precedence as a curiosity.

The sheep show was not a large one, but with some very good pens of Shropshire Downs as usual, and some capital pure Downs from Lord Walsingham's now-famous flock. They were especially noticeable for their uniformity of character. So even were they in excellence, that it would have been difficult from which to pick the best sheep—from a prize, or merely a commended pen. None of his lordship's sheep go from Birmingham to Smithfield, having all been sold and delivered on the spot. Whatever prizes, consequently, may be taken in Baker-street, will be by fresh sheep, and only speak the more to the general goodness of the flock.

The show of pigs at Birmingham is always good, but this year it was extraordinary for its excellence. The judges commended whole classes one after another, and almost every breed of swine in the kingdom was well represented; white or black, large and small, fat or for breeding—in every class the entries were large, and in every one the sample was good. When fat pigs are shown as fat pigs, it is a treat to stir them up; and the well-fed grunners in Bingley Hall at once suggested that approaching combination with turkeys and chickens, to be found in equal variety and profusion just over the way.

There is no denying that the Poultry Show still continues the chief point of attraction here. It takes more with all classes than a show of simply cattle and sheep can ever hope to attain to. At the private view on Tuesday last we met more well-dressed women, accompanied by more white neckcloths of orthodox tie, than we ever saw at any such meeting before. The fact is, that at best it can be but an amateur business after all: and so we have Master Daniel Davies showing against his father, and Master Herbert Davies against his brother; and Miss Sarah Dixon invincible with her Polish troops; sweet Elizabeth Lavender rejoicing with her "Archangels;" and the

Rev. Mr. Hodson modestly asking a thousand pounds for a lot of Cochín Chinas! We certainly were shown three white geese, not even commended, which were marked as sold at a hundred pounds! And the Society, be it remembered, charges ten per cent. on every sale effected. Without going minutely into the matter, we should say that the Dorkings, Spanish, and Game Fowl had the best of the week's business.

We can only repeat that in its arrangements the Birmingham Show is one of the best we have. As we have said long ere this, its very catalogue is a model of completeness and ready reference; while Bingley Hall is a long way in advance of any show-yard we ever yet entered. There may, however, be one improvement here, especially when we can say literally there is plenty of room for it. Considering how the visitors crowd to the Poultry Stands, the avenues might be widened with much advantage and convenience. What with an abundance of crinoline and curiosity, the streams of people were last week perpetually coming to a dead lock, when they might easily have gone up one side and down the other.

We only regret to see, from what took place at the annual meeting, that the society is hardly as flourishing as it should be. At the same time we feel that it can but require a little well-directed exertion to maintain that deservedly-high character the meeting now enjoys. As for Bingley Hall, its uses surely should be innumerable. It is a circus ready-made to order; or a raree-show of any kind whatever; a promenade concert; a public meeting-room; and a horticultural society's best friend. If Birmingham cannot do more with Bingley Hall, we do not understand the requirements of the age.

## A W A R D O F P R I Z E S.

### FAT CATTLE.

#### JUDGES.

Mr. JOHN BOOTH, Killyerby, Catterick, Yorkshire.  
Mr. JOHN TANNER DAVY, Ashtown House, South Molton, Devon.  
Mr. JOHN WILLIAMS, Saint Mary's, Kingsland, near Leominster.

### HEREFORDS.

#### HEREFORD OXEN OR STEERS.

First prize, £10—Mr. Joseph Phillips, Ardington, Wansage. Silver Medal to breeder—Mr. Thomas Carter, Dodmore, near Ludlow.

Second, £5—Mr. John Naylor, Leighton Hall, Welshpool.  
*Highly commended*—Mr. William Heath's:

#### HEREFORD STEERS.

First prize, £10—Lord Hatherton, Teddesley Park. Silver Medal to breeder—Mr. Thomas Carter, Ticklerton Hall, Church Stretton.

Second, £5—Mr. Edmund Wright, Halston Hall, Oswestry.

*Highly commended*—His Royal Highness Prince Albert's steer.

*Commended*—Another of Prince Albert's steers.

#### HEREFORD COWS.

First prize, £10—Mr. Edmund Herbert, Powick, Worcester. Silver Medal to breeder—Mr. Daniel Burnett, White House, Turnstone, Herefordshire.

Second, £5—Mr. Edward Price, Court House, Pembridge, Herefordshire.

*Commended*—Mr. John Stephen's cow, Shepphouse, Ilay, Breconshire.

## HEREFORD HEIFERS.

First prize, £10, GOLD MEDAL, as best cow or heifer of any breed or age in the Exhibition, and Silver Medal as breeder—Mr. George Pitt, Chadnor Court, Dilwyn, near Leominster.

Second, £5—Mr. Richard Thomas, Ryton, Dorrington, Shropshire.

*Highly commended*—Mr. Joseph Phillips's heifer.

*Commended*—Lord Hatherton's heifer.

## SHORTHORNS.

## SHORTHORN OXEN OR STEERS.

First prize, £10, GOLD MEDAL, as best ox or steer of any breed or age in the Exhibition, and Silver Medal as breeder—Mr. Richard Stratton, Broad Hinton, near Swindon.

Second, £5, Mr. Samuel Wiley, Brandsby, York.

*Commended*—Lord Leigh's beast, Stoneleigh Abbey, Kenilworth.

## SHORTHORN STEERS.

First prize, £10, the Duke of Beaufort, Badminton, Gloucestershire. Silver Medal to breeder, Mr. George Sainsbury, The Priory, Corsham.

Second, £5, the Rev. John Holmes, Brook Hall, Norwich.

*Commended*—Mr. Lovell Cowley, Ashby St. Ledger's, Rugby.

*Competed for Sweepstakes*—Mr. William Hower, Sevenhampton, Highworth, Wiltshire, and the Rev. John Holmes. Mr. Holmes declared the winner.

## SHORTHORN COWS.

First prize, £10, and Silver Medal as breeder, Mr. Richard Stratton.

Second, £5, Mr. Joseph Phillips, Ardington.

*Highly commended*—Mr. William Fletcher, Radmanthwaite, Mansfield, Notts.

*Competed for Sweepstakes*—Earl Spencer, K.G., Althorp Park, near Northampton, and Mr. Richard Stratton. Mr. Stratton declared the winner.

## SHORTHORN HEIFERS.

First prize, £10, Mr. John Armstrong, Palterton, Chesterfield, Derbyshire. Silver Medal to breeder, the late Mr. Henry Champion, Ranby House, near Retford, Nottinghamshire.

Second, £5, Mr. Joseph Phillips, Ardington.

*Highly commended*—Mr. Robert Swinerton's heifer, Weddington, Nuneaton.

*Commended*—Mr. John Stubb's, Weston Hall, Staffordshire, and Mr. Richard Thomas, Ryton, near Dorrington, Shropshire.

## DEVONS.

## DEVON OXEN OR STEERS.

First prize, £10, His Royal Highness Prince Albert; Silver Medal to breeder, Mr. George Turner, Barton, Exeter.

Second, £5, Mr. William Heath, Ludham.

*Highly commended*, the Earl of Leicester, Holkham, Norfolk.

*Commended*, the Earl of Aylesford, Packington, Warwickshire; and the Earl of Leicester's beasts.

## DEVON STEERS.

First prize, £10, and Silver Medal as breeder, the Earl of Leicester.

Second, £5, His Royal Highness Prince Albert.

*Commended*, His Royal Highness Prince Albert.

## DEVON COWS.

First prize, £10, and Silver Medal as breeder, Mr. Abraham Umbers, Weston Hall, Leamington.

Second, £5, Mr. Abraham Umbers.

## DEVON HEIFERS.

First Prize, £10, and Silver Medal as breeder, Mr. Abraham Umbers.

## LONG-HORN S.

## LONG-HORN COWS OR HEIFERS.

Prize, £5, Mr. D. B. Holborow, Knockdown, near Tetbury, Gloucestershire.

*The whole class commended.*

## OTHER PURE BREEDS AND CROSS-BRED ANIMALS.

## FAT OXEN OR STEERS.

First prize, £10, and Silver Medal as breeder, Mr. John Naylor, Leighton Hall. (Cross bred.)

Second, £5, Colonel Pennant, Peuryhn Castle, Bangor. (Cross-bred.)

## FAT COWS.

First prize, £10, Mr. John Faulkner, Bretby Farm, near Burton-upon-Trent; Silver Medal to breeder, Mr. Daniel Earp, Staunton Harrold, near Ashby-de-la-Zouch. (Short-horn, cross.)

Second, £5, Mr. W. T. Cox, Spondon Hall, near Derby. (Cross.)

## FAT HEIFERS.

(The first prize withheld.)

Second, £5, Mr. Richard Timms, Braunstone, Northamptonshire. (Cross.)

## SCOTCH BREEDS.

## SCOTCH OXEN OR STEERS.

First prize £10, the Duke of Beaufort (West Highland).

Second, £5, the Duke of Beaufort (West Highland).

*Commended*, Mr. Ralph Sneyd, Keele Hall, Staffordshire, for two West Highland.

## WELSH BREEDS.

## WELSH OXEN OR STEERS.

First prize, £10, Colonel Pennant, Peuryhn Castle.

Silver Medal to Breeder, Mr. William Lewis, Thondeg.

[No second prize awarded.]

## EXTRA CLASSES.

(For Animals not qualified to compete in any of the preceding Classes.)

## OXEN OR STEERS.

Silver Medal, Mr. John Carwardine, Stockton Bury, Leominster, Herefordshire (Hereford).

## COWS OR HEIFERS.

Silver Medal, Mr. W. T. Cox, Spondon, near Derby (Cross). Additional Silver Medal, Mr. Richard Hill, Golding, near Shrewsbury (Hereford).

*Commended*, Mr. Alexander Campbell, Monzie Castle, Perthshire (West Highland.)

*Good of its kind*, the Earl of Derby (Brahmin and Gallo-way cross).

## SHEEP.

## JUDGES:

Mr. JNO. MOON, Hurstbourne Priors, near Whitechurch, Hants.

Mr. WILLIAM SANDAY, Holme Pierrepont, Nottingham.

Mr. BENJAMIN SWAFFIELD, Filsbury, near Ashbourne.

## LEICESTERS.

(Pen of three Fat Wethers, not exceeding twenty-two months old.)

First prize, £10, Silver Medal, as best pen of Long-woolled Sheep in the Exhibition, Mr. Joseph Smith, Riseborough, near Kirby-moorside, Yorkshire; Silver Medal to Breeder, Mr. John Hopper, Brompton, Scarborough.

Second, £5, Mr. G. S. Foljambe, Osberton Hall, near Worksop.

## LEICESTERS.

(Pen of three Fat Wethers, exceeding twenty-two but not exceeding thirty-four months old.)

First prize, £10, and Silver Medal as Breeder, the Marquis of Exeter, K.G., Burghley House, Stamford.

[No second prize awarded.]

## LONG-WOOLLED SHEEP, NOT BEING LEICESTERS.

(Pen of three Fat Wethers, not exceeding twenty-two months old.)

First prize, £10, and Silver Medal as Breeder, Mrs. Sarah West, Greenhill Farm, Bletchington, Oxfordshire.

Second, £5, Mr. William Slater, Stratton, Cirencester.

## LONG-WOOLLED SHEEP, NOT BEING LEICESTERS.

(Pen of three Fat Wethers, exceeding twenty-two but not exceeding thirty-four months old.)

[No entry.]

## SOUTH AND OTHER DOWN SHEEP.

(Pen of three Fat Wethers, not exceeding twenty-two months old.)

First prize, £10, Silver Medal, as best pen of Short-woolled Sheep in the Exhibition, and Silver Medal as Breeder, Lord Walsingham, Merton Hall, Thetford, Norfolk.

Second, £5, Lord Walsingham.  
*Commended*, Lord Walsingham.

**SOUTH AND OTHER DOWN SHEEP.**

(Pen of three Fat Wethers, exceeding twenty-two but not exceeding thirty-four months old.)

First prize, £10, and Silver Medal as breeder, Lord Walsingham.

Second, £5, Lord Walsingham.

**SHROPSHIRE AND OTHER BLACK OR GREY-FACED SHORT-WOOLLED SHEEP.**

(Pen of three Fat Wethers, not exceeding twenty-two months old.)

First prize, £10, and Silver Medal as breeder, Mr. Samuel Craven Pilgrim, Burbage, near Hinckley, Leicestershire.

Second, £5, Mr. Henry Smith, jun., Sutton Maddock, Shifnal.

*Highly commended*, Mr. James Hand, Ludlow.

**SHROPSHIRE AND OTHER BLACK OR GREY-FACED SHORT-WOOLLED SHEEP.**

Pen of three Fat Wethers, exceeding twenty-two, but not exceeding thirty-four months old.

First prize, £10, and Silver Medal as breeder, Mr. Henry Smith, jun., Sutton Maddock.

Second, £5, the Earl of Aylesford, Packington.

*Commended*, The Honourable Robert Curzon, Hagley Hall, Rugeley, and the Earl of Aylesford.

**CROSS-BRED SHEEP.**

(Pen of three Fat Wethers, not exceeding twenty-two months old.)

First prize, £10, and Silver Medal as breeder, Mr. Adam Corrie Keep, Wollaston, Northamptonshire.

Second, £5, Mr. Adam Corrie Keep.

**CROSS-BRED SHEEP.**

(Pen of three Fat Wethers, exceeding twenty-two but not exceeding thirty-four months old.)

First prize, £10, Silver Medal as breeder, and Silver Medal for best pen of Cross-bred Sheep, Mr. Henry Thornley, Marston Hall, near Birmingham.

Second, £5, Mr. Henry Thornley.

**P I G S.**

**J U D G E S :**

MR. WILLIAM SANDAY, Holme Pierrepoint, Nottingham.  
 MR. JNO. MOON, Hurstbourne Priors, near Whitechurch, Hants.  
 MR. BENJAMIN SWAFFIELD, Pilsbury, near Ashbourne.

**FAT PIGS.**

(Pen of three Fat Pigs of one litter, not exceeding ten months old.)

First prize, £10, Mr. George Bowes Moreland, Chilton, Abingdon, Berks; Silver Medal to breeder, Mr. George Underwood, Ashridge Park Farm, Berkhamstead, Hertfordshire.  
 Second, £5, Mr. Richard Benyon, Englefield House, Reading, Berkshire.

*Highly commended*, Mr. John Beach, Redmarley Park, near Newent, Gloucestershire.

*Commended*, Mr. Henry Lowe, Comberford Lodge, Tamworth.

**FAT PIGS.**

(Pen of three Fat Pigs of one litter, not exceeding fifteen months old.)

First prize, £10, and Silver Medal as Breeder, His Royal Highness Prince Albert.

Second, £5, Mr. Clement Cottrell Dormer, Rousham, Oxfordshire.

*Highly commended*, Mr. John Faulkner, Bretby Farm, and Mr. Charles Holland, The Lymes Farm, Seabridge, Newcastle, Staffordshire.

*The whole class commended.*

**FAT PIGS.**

(Fat Pig, exceeding fifteen months old.)

First prize, £10, and Silver Medal as breeder, Mr. Robert Harrison Watson, Bolton Park, Wigton, Cumberland.

Second, £5, Mr. Charles Holland, The Lymes Farm.

*Highly commended*, Mr. James Marriott, Floore, near Weedon, Mr. John Holdway, Weston, near Bath, Mr. George Mangles, Givendale, Ripon, Yorkshire, and Mr. Charles Holland, The Lymes.

*The whole class commended.*

**BREEDING PIGS.**

**PIGS OF A LARGE BREED.**

(Pen of five Pigs of one litter, exceeding three and not exceeding six months old.)

First prize, £10, and Silver Medal as breeder, Mr. Joseph Smith, Henley-in-Arden, Warwickshire.

Second, £5, Mr. William Endall, Henley-in-Arden.

Silver Medal, Mr. Edward H. France, Ham Hill, Worcester.  
 Silver Medal, Mr. William Hewer, Sevenhampton, High-worth, Wiltshire.

*Commended*, Mr. William Bradley Wainman, Carhead, near Cross Hills, Yorkshire; and Mr. Thomas Whittington, jun., Wootton Wawen, Henley-in-Arden, Warwickshire.

**PIGS OF A SMALL BREED.**

(Pen of five Pigs of one litter, exceeding three and not exceeding six months old.)

First prize, £10, and Silver Medal as breeder, His Royal Highness Prince Albert, Windsor Castle.

Second, Mr. Samuel Wiley, Brandsby, near York.

Silver Medal, Mr. George Mangles, Givendale.

Silver Medal, Colonel Pennant, Penrhyn Castle.

Silver Medal, Mr. George Turner, Barton, near Exeter.

Silver Medal, Mr. Robert Harrison Watson, Bolton Park, Wigton, Cumberland.

*Highly commended*, Mr. George Mangles, Givendale; and Mr. Samuel Wiley, Brandsby.

*Commended*, Mr. George Mangles, Givendale; and Mr. Joseph Chinn, Gas-street, Birmingham.

**REFEREES FOR THE AGES OF PIGS.**

Professor SIMONDS, Royal Veterinary College, London.

Mr. WILLIAM HOLLINGSWORTH, Bilston.

**VETERINARY INSPECTOR AND GENERAL REFEREE.**

Mr. R. L. HUNT, Cannon-street, Birmingham.

The following certificates were given in reference to the pens of Pigs disqualified:—

“December 1st, 1856.

“We hereby certify that the state of the dentition of the pigs, pens 180 and 211, shows that the animals are of different litters.

“JAS. B. SIMONDS,  
 “ROBERT L. HUNT,  
 “WM. HOLLINGSWORTH.”

“December 1st, 1856.

“We hereby certify that the state of the dentition of the pigs, pen 219, indicates that they exceed the age stated in the owner's certificate.

“JAS. B. SIMONDS,  
 “ROBERT L. HUNT,  
 “WM. HOLLINGSWORTH.”

**PRIZES FOR ROOTS.**

**J U D G E.**

Mr. J. MATHEWS, Edgbaston-house, Birmingham.

For the best Collection of the following varieties, viz:—LONG MANGOLD WURZEL, GLOBE MANGOLD WURZEL, SWEDES, and CARROTS (Six Roots of each), a SILVER CUP, value £10, to Mr. A. H. Johnson, Manor-house, Gunnersburg, Acton, Middlesex.

*Highly commended*, Mr. Richard Benyon, Englefield-house.

*Commended*, Mr. Samuel Robinson, Shaw-house, Melbourne, Derbyshire.

**LONG MANGOLD WURZEL.**

First prize, £2 2s., Mr. A. H. Johnson, Manor-house.

Second, £1 1s., Mr. A. H. Johnson, jun., Hanger-hill, Acton, Middlesex, Gunnersburg.

*Commended*, Mr. Samuel Robinson, Shaw-house, Melbourne.

**GLOBE MANGOLD WURZEL.**

First prize, £2 2s., Mr. A. H. Johnson, Manor House.

Second, £1 1s., Mr. Charles Pratt, Stratford-upon-Avon.

*Highly commended*, Mr. Richard Benyon, Englefield House.

*Commended*, His Royal Highness Prince Albert.

*Commended*, Sir Francis Goodricke, Bart., Studley Castle, near Bromsgrove; the Rev. Thomas Stevens, Bradfield Rectory,

Reading; Mr. Samuel Druce, jun., Abbey Farm, Eynsham, near Oxford; and Mr. A. H. Johnson, jun., Hanger Hill.

**SWEDS OF ANY VARIETY.**

First prize, £2 2s., Mr. T. R. B. Cartwright, Ayhno, Northamptonshire.

Second, £1 1s., Mr. Robert Fellowes, Bitteswell Hall, Luttermouth.

Highly commended, Messrs. Proctor and Ryland, Great Lister-street Works, Birmingham; and Mr. William Fletcher, Radmanthwaite, Mansfield.

Commended, Mr. George Mangles, Givendale; and Mr. George McCann, Graham House, Great Malvern.

**COMMON TURNIPS.**

First prize, £2 2s., Rev. Thomas Stevens, Bradfield.

Second, £1 1s., Mr. John Wright, Hulland Hall, Ashbourne.

**CARROTS OF ANY VARIETY.**

First prize, £2 2s., Mr. Joshua Harding, Rosliston, Burton-upon-Trent.

Second, £1 1s., Mr. G. S. Foljambe, Osberton Hall.

Commended, Mr. John Baynton Starky, Spye Park, Chippenham; and Mr. Samuel Druce, jun., Abbey Farm, Eynsham.

**OX CABBAGE.**

First prize, £2 2s., Mr. Samuel Robinson, Shaw House, Melbourne, Derbyshire.

Second, £1 1s., Mr. Robert Fellowes, Bitteswell Hall, Luttermouth.

**POTATOES.**

First prize, £2 2s., Mr. W. F. Taylor, Moseley Hall.

Second, £1 1s., Lord Leigh, Stoneleigh Abbey.

**The JUDGES OF POULTRY were**

Mr. GEORGE JAMES ANDREWS, Dorchester.

Mr. JOHN BAILY, Mount-street, Grosvenor-square, London.

Mr. THOMAS CHALLONER, Burnt Leys, Whitwell, near Worksop.

Mr. EDWARD HEWITT, Eden Cottage, Sparkbrook, near Birmingham.

The Rev. ROBERT PULLEINE, the Rectory, Kirby Wisle, near Thirsk.

**JUDGES OF PIGEONS.**

Mr. T. J. COTTLE, Pulteney Villa, Cheltenham.

Mr. EDWARD HALE, Haudsworth.

Bingley Hall, with its vast amount of room for stock, abundant provision for the display of seedsmen's samples and specimens, long colonnades and tiers of permanently-erected poultry pens, and ample space for the comfortable accommodation of an immense concourse of visitors, has undoubtedly held this year the most magnificent collection of fat cattle and splendid poultry ever assembled within its walls. The following table affords a concise history of the numbers in the various classes at each show; and though a considerable decrease is observable in some departments, we shall soon explain that this deficiency in no way detracts from the character and quality of the exhibition.

	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.
Cattle .....	81	117	138	127	129	119	88	109
Sheep .....	40	55	71	83	59	61	64	46
Pigs .....	221	173	165	93	113	56	63	99
Total ....	342	345	314	323	301	236	215	254
Roots .....	..	..	..	..	..	..	142	119
Poultry .....	233	565	935	1138	1995	1608	1607	1210
Pigeons .....	20	51	120	85	280	137	201	205
Total ....	243	556	1055	1238	2275	1745	1808	1415

The number in the classes of Fat Cattle are thus distributed: Herefords, 23; Shorthorns, 28; Devons,

21; Longhorns, 5; other pure breeds and cross-bred animals, 15; Scotch breeds, 6; Welsh breeds, 2; extra classes, 9. Taken as a whole, the cattle classes were all exceedingly good; very few traces of plainness or defective quality being discoverable.

The Herefords were never better bred or fed.

Mr. Phillips's prize ox is remarkable for his fine symmetry and superior quality of meat: his chine, shoulder, and forequarter exceedingly good. Mr. Naylor's second prize beast is of great size, and extraordinarily well fed: back, hip, tut, flank, and other points, more especially fine. The two steers exhibited by His Royal Highness Prince Albert have considerable merit; but we should say that one is not quite so firm in hand as some. Lord Hatherton's prize steer has a great forequarter, good back, thighs, and flank. Mr. Herbert's prize cow is certainly the best, in the judgment of the butcher, being very fat, and an uncommonly fine animal; however, Mr. Price's second prize cow, for form and quality, was preferred by many. Mr. Hall's cow appeared to us so meritorious for her great depth of forequarter, outspringing chine, and splendid back and flank, that we were surprised to find her not even commended. Mr. Pitt's prize heifer, though somewhat small in frame, is very beautiful indeed in her compact proportions, fine head and bone, and prime quality of flesh.

The Shorthorns muster fewer noble specimens than on some previous occasions. Mr. Stratton's prize ox has an uncommonly great breadth of chest, straight good back, tail well set on, and his flesh of remarkably good quality. Mr. Willey's second prize, and Lord Leigh's commended ox, were both exceedingly good; the former especially for loin and flank; the latter for his level back and firm meat. The Duke of Beaufort's prize steer is very handsome, and good in several points. We particularly admired Mr. Cowley's steer, commended in this class. Mr. Stratton's prize cow is a very extraordinary animal; her immense capacity of frame, breadth across the hips, and surprising amount of firm flesh, being really wonderful. We would mention also Earl Spencer's beautiful cow, and that of Mr. Fletcher's, highly commended, as very superior animals.

We have never witnessed a better show of Devons, which far surpass those exhibited last year. His Royal Highness Prince Albert has carried off the prize with a beautifully-proportioned ox, having a broad and deep forequarter, fine head, very good meat, and a curly coat. We particularly noticed the Earl of Leicester's highly commended ox: his prize steer, Prince Albert's commended steer, and Mr. Heath's superior second-prize animal, are well worthy of the distinction awarded them. Mr. UMBER's first and second prize cows are of very beautiful quality, and exceedingly handsome.

Among the Long-horned cattle, Mr. Holburrow's prize cow, ten years and nine months old, has great size, great forequarter, and loin, thigh, and twist particularly good. Mr. Cox's long-horned steers show very great size and heavy flesh. His cross-bred cow is of splendid quality, tut and hip extraordinary, and back, chine, and forequarter exceedingly good; and her head is very

handsome, with the exception of her horns curving too much downward. Mr. Faulkner's cow, however, has taken the prize, being certainly a very superior animal.

Some of the Scotch cattle are particularly good; as, for instance, one of those shown by the Duke of Beaufort, remarkable for its depth of forequarter and compact proportions. In the extra classes, Mr. Cox's cow took our attention, being very fine in head and bone, and having a very large quantity of good meat.

The show of Sheep is much smaller than usual.

Of Leicesters there are 6 entries; of Long-wools, 4; Southdowns, 9; Shropshires, 16; and Crossbreds, 11.

The Leicester wethers are a pretty good class; and we may observe that in the opinion of many the second prize pen of Mr. Foljambe were preferred to Mr. Smith's lot which took the first prize. The Marquis of Exeter's prize wethers are very compact in form, with wide forequarters, good rump, and superior wool.

Mr. Slatter's long-wool wethers are of very great size, beautiful form and quality, and only a little inferior in hand to Mrs. West's prize pen. In the Down classes, Lord Walsingham's prize wethers were by far the most meritorious; for size, breadth, good rumps and legs of mutton, and fine quality of meat, they gained general admiration. The Shropshires possess some great frames, and are very high-standing sheep, but their want of breadth and symmetry in some pens was not at all in favour of the class. Mr. Pilgrim's prize lot were very superior animals; and Mr. Smith's 2nd prize wethers are beautiful, being outsprung and well-proportioned—their loins and rumps very good indeed. We especially admired Mr. Smith's prize wethers in the next class, for their splendid quality of meat, broad chins, and full plaits, and wonderfully good loins and rumps. It is a pity that some exhibitors of short-wooled sheep take so much trouble with the shears and naphtha-lamp, as however smooth and flowing an outline may attract the eye, the hand is chiefly engaged in ascertaining the merits of form and quality. In the class of cross-bred sheep, Mr. Keep's prize pen and the Earl of Leicester's pen seemed to us most meritorious; and we could have wished that a commendation had been bestowed upon Mr. John Overman's extraordinarily fine animals.

The classes of Pigs were all good. The breeding pigs, indeed, may be characterized as superior to any before exhibited, and well meriting the large number of silver medals awarded them. The class of "fat pigs not exceeding ten months old," had some wonderfully fat and fine animals; and the whole class is very deservedly commended. Mr. Watson's prize pig, 37 months old, is remarkably well covered with flesh, and of splendid quality. Mr. Hemming's pig, aged 17 months, is immensely fat; neck, chine, and shoulder tremendous; and though not a large-framed animal, the weight is estimated at 600 lbs. Among the breeding pigs, which are all very beautiful, we would especially mention Mr. Jas. Smith's Berkshires, Mr. Endall's of the Tamworth breed, those of Mr. Mangles, Mr. Wiley, and His Royal Highness Prince Albert. We were pleased to find that the veterinary inspectors

have been active in this department of the show, having disqualified two pens on account of the animals being of different litters, and another because the pigs exceeded the age stated in the owner's certificate.

In the department of Roots, many very splendid specimens competed for the premiums, the size and prime quality of the mangolds, swedes, and ox-cabbages being very truly surprising.

The Poultry-classes were never better than on this occasion. The Hamburg and Polish fowls are extremely beautiful: the Cochins, and still more the Dorkings, are very fine indeed; and of the Spanish, the judges properly declare that "they surpass anything they ever saw." The game fowls are all of them splendid birds. The ducks are remarkably good; and the turkeys and geese have attained such a colossal size as to be really astonishing. It is impossible to select particular pens for comment without doing injustice to a vast number of birds nearly equal in merit. The pigeon classes are excellent—some for their extraordinary plumage, some for the dimensions to which various varieties have been raised.

It will be enough to mention, as an indication of the great superiority of the poultry and pigeon classes this year, that, while 13 silver cups, and 189 money prizes have been awarded them, the judges have given no less than 206 commendations.

#### THE ANNUAL MEETING

Was held on Thursday afternoon, at one o'clock, at Dee's Royal Hotel, the Earl of Lichfield, President for the past year, in the chair. Among others present were, the Mayor of Birmingham (John Radcliff, Esq.), and Messrs. Richard Spooner, M.P., C. N. Newdegate, M.P., C. M. Caldecott, Wm. Mathews, Wm. James, Howard Luckcock, Baron D. Webster, Alderman Holliday, G. C. Adkins, T. B. Wright, John Lowe, B. Dain, H. Wiggins, J. Mathews, C. Dain, W. Mathews, jun., and John Harlow.

The first business was to elect a president for the ensuing year; and on the motion of Mr. Jeremiah Mathews, seconded by Mr. Spooner, Lord Ward was selected to fill the office.

Two vacancies in the Council—one occasioned by the death of Mr. Samuel Burbery, one of the earliest supporters of the Exhibition, and the other by the resignation of Mr. Edwin Hewitt—were reported. On the motion of Mr. Luckcock, seconded by Mr. Caldecott, Mr. Alderman Hodgson (the ex-Mayor), and Mr. Edward Freer, jun., were elected to supply their places.

The Chairman afterwards proceeded to refer to the abolition of the annual dinner, which was determined upon at the General Meeting held in December last, and to suggest that the consideration of this subject might be conveniently revived. He thought they would do well to have a dinner, which should however take place some time, say about six weeks before the Show, and to hold the annual meeting on the same day. Many gentlemen, like himself, were anxious to have large parties in their houses at the time of the Show, and it was inconvenient for them to remain in Birmingham to attend either the meeting or the dinner, if they were held in the same week as the Show. He entertained a decided opinion that there should be a meeting of some kind during the Show, for lectures or discussions which were calculated to diffuse practical information among the tenant-farmers who attended it. Something of the kind was suggested last year, but difficulties appear to have interposed to prevent its being carried out. He did not see why they should not endeavour to raise a fund which would enable them to offer a prize for an essay on some subject of importance connected with agriculture. He should be glad to subscribe to such a fund. The essay ought to be read at some meeting

to be held for the purpose, and they might have a discussion upon it. The essay, for instance, might be upon the most profitable system of farming on light and on strong land in the Midland Counties. The prize to be offered should not, he considered, be less than £100. The suggestion, however, was one for the consideration of the meeting.

A long and somewhat desultory discussion ensued. Mr. Caldecott thought that a lecture by some man of eminence would prove more attractive than an essay; while the Chairman observed that the course recommended by Mr. Caldecott would answer the object he (Lord Lichfield) had in view, which was to bring the farmers together.

Mr. WRIGHT heartily approved of the proposal for an essay, as it was in accordance with a suggestion made by himself some years ago, and about which no definite conclusion was arrived at. They might for £20 or £30 obtain an essay on the principal breeds of cattle, which would prove highly interesting and instructive. As to the dinner, he did not quite see that any good could arise from holding it in November, as the entries for the ensuing exhibition were then closed. All they would have to talk about would be the prospects before them, and no change or improvement could be made in their arrangements.

Mr. LOWE (of the firm of Mapplebeck and Lowe) spoke in favour of the trial of the essay experiment, and offered, on behalf of himself and partner, a subscription of ten guineas towards it.

Mr. W. MATTHEWS said it was found that whilst the show was pending it was not a satisfactory time to meet the subscribers. He thought it would be better to meet the first week in February. The question was, whether the dinner and the meeting of subscribers could not be held in February, so that an account could be rendered to the subscribers, who might elect or re-elect, as they pleased, the officers for the ensuing year.

The CHAIRMAN observed that, as to the arrangements for the dinner in February, there were some objections to the time; for a dinner held a month after the show was not likely to be as successful as one held a month before the show took place, for in the former case people would have ceased to take that interest in a dinner as they would do if it were held a short time previous to the show.

Mr. MATTHEWS said they must have a meeting of subscribers in the last week in January, or the first week in February.

The CHAIRMAN said he did not think they could connect the dinner with the meeting if they held the meeting at such a time as Mr. Mathews mentioned; and a dinner went far towards bringing people together, and causing them to take an interest in such matters.

Mr. WRIGHT observed that what was wanted was a greater addition to their list of permanent subscribers, by which they would obtain a permanent fund; so that they would not have to be dependent upon the weather, as was the case at present.

Mr. W. MATTHEWS agreed that a good dinner was a very good thing, but the excitement was very temporary; and if the dinner were to take place long before the show, the steam would evaporate, and much of the benefit would be lost. As to the essay or lecture, it might be read or delivered an hour or two before the dinner took place. It would not be well to begin on too ambitious a scale. A good lecture was better than an indifferent essay, and they could not expect a very good essay on such matters. They ought to be better up in money matters. He thought it would be better to give a professor ten guineas for a lecture to be delivered an hour or two before the dinner, which should not take place very long before the show, and then it would have a very good effect.

Ultimately, no resolution respecting the dinner was come to; but a number of gentlemen made a promise to attend (n. v.) in October, if a dinner took place at that time.

Mr. SPOONER said, they ought annually to have a meeting, at which the Council could meet the subscribers, and lay before them an exact statement of their affairs. If they had had such a meeting they would have been spared an attack which had been made upon them by a local journal. The Council were charged with paying £300 per annum for Bingley Hall, while only using it for one week in each year. But it should be remembered that the hall was in their hands for the whole year, and that they had the privilege of letting it. The speculation was expected to turn out an advantageous one, but in this the Council had been disappointed, and

they were now about to alter the agreement. Again, they had been charged with making the show a means of creating dividends for the proprietors of Bingley Hall. He (Mr. Spooner) was one of those proprietors, and, with the exception of small dividends in the first and second years, he had had no return upon his investment. He regretted that these statements should be made, and he thought the subscribers should be earnestly invited to attend a meeting, at which the Council might state fully what they had done, and what were their prospects for the future. Whatever appeared extravagant in the expenditure might then, if necessary, be remedied, and a proper supervision maintained. It had been remarked that out of an income of £3,300 they only gave £1,350 in prizes; but this was nothing extraordinary, considering the vast expense attending the Exhibition. The whole of the subscriptions from Birmingham were under £300, and this the town received back in rates; while, on the other hand, the West of England and Royal Agricultural Societies were largely supported in the towns they visited. They must remove the impression that there had been a "job" between the Council of the Cattle Show and the Bingley Hall proprietors. Their expenditure might have been in some instances too lavish, but it was much more difficult to establish a society of this kind than to keep it going. If the position of the society were generally known, he believed the amount of their subscriptions would be materially increased.

Alderman HOLLIDAY said he belonged to a class of persons who might be induced to subscribe much more largely than they at present did to the cattle show if a proper canvass were made, and if the public knew something of the proceedings in connection with the society. In subscribing to the erection of Bingley Hall he had in view the removal of that feeling of antagonism between the commercial and agricultural classes which formerly existed, and that object had been to a great extent obtained. While regretting that the Birmingham subscriptions were small, he felt that it was in a great measure the fault of the Council. One cause of complaint was that the annual accounts published by the Council did not inform the public as to the state of the finances. Had it been known in the town that the Council spent £1,400 or £1,500 a year more than they received, there would have been a large increase in the subscriptions. He had every reason to believe that the canvass had been most incomplete. With the strong feeling that existed in reference to the benefit arising from the show, the subscriptions might, if proper measures were adopted, be increased from £300 to £3,000.

Mr. CALDECOTT said that of the £800, the rent of Bingley Hall, £375 were paid for ground-rent to the Governors of King Edward's School; the other charges were £180, leaving the rent, supposing it was received at all, little more than £200 per annum. The secretary's salary had been reduced to £100, and the society's offices had been closed. A considerable saving had also been effected in the item of printing.

Mr. J. MATTHEWS and Mr. ADKINS remarked that during the canvass repeated calls had been made, even upon gentlemen of high standing in the town, without any subscription whatever being obtained.

The CHAIRMAN suggested the appointment of a committee of tradesmen to undertake the task of receiving subscriptions. It was clear that the Council, who had endeavoured to make their canvass as complete as possible, had not been met as they ought to have been by the town, and the society could not go on unless it met with more liberal support. Some dissatisfaction had been expressed at the prospect of the Exhibition being removed to some other place. From his experience as president of the society, he felt that it would not be in their power to go on without a large increase in the subscriptions. Having appointed a Tradesmen's Committee, the close of another year would show what assistance they might expect from the inhabitants of Birmingham. He was glad to hear from Mr. Holliday that the advantages of the show were fully appreciated. Speaking on behalf of the agriculturists of the midland counties, he felt it to be of the highest importance to know that there was a strong interest felt in their proceedings in a town like Birmingham. The intercourse of the commercial and agricultural classes on such occasions was productive of a large amount of good. Birmingham was eminently fitted for the holding of a cattle show by its situation and its facilities of intercourse, and he should be extremely sorry to see any alteration made. At the same time it was evidently not a question which the Council could decide, as it



depended entirely upon the amount of support accorded them by the inhabitants of the town.

Mr. J. MATHEWS said that the farmer, when asked for his guinea, replied, "Yes, it's all very fine; but who reaps the benefit, and what do the tradesmen of Birmingham do for us?" One proof of the apathy that existed on the subject was that, after that meeting had been regularly advertised, the only subscriber present who was not a member of the Council was Mr. Alderman Holliday.

Mr. HOLLIDAY thought the subscribers ought to be summoned by circular.

The CHAIRMAN considered the suggestion a good one, as it was mistaken economy to reduce the publicity of their proceedings. He thought the Council had made a mistake in the reduction of their advertisements this year—a step which he considered in no respect advisable.

After some further conversation of a desultory character, it was moved by Mr. CALDECOTT, seconded by Mr. SPOONER, and carried unanimously, "That a special meeting of the subscribers, convened by circular, be held in the Committee-room of the Town Hall on the last Monday in January next, for the purpose of receiving from the Council a statement of accounts and a Report of the proceedings of the Society during the year."

The other questions brought under discussion were left undecided until the adjourned meeting.

The proceedings closed with a vote of thanks to the noble Chairman, who in responding referred to the untiring efforts of Messrs. Luckcock, James, Lowe, Mathews, Wright, Shackel, and others, under whose active superintendence the arrangements for the Exhibition had been most effectually carried out.

## RUTLAND AGRICULTURAL SOCIETY.

The annual exhibition of stock in connexion with this society took place at Oakham on Wednesday, Dec. 3, when the company visiting the Riding House had the pleasure of witnessing one of the best—some said the best—exhibitions of cattle that has been brought together since the establishment of the association, 26 years ago. Taken collectively, we may venture to affirm that a finer array of animals, in every department, has seldom been seen at any county show; and this fact is additional evidence of the skill in breeding and feeding which has so often been displayed by the farmers of Rutland and the district. The entries in each class were equal in number to those of former years. For oxen or steers, there were ten competitors in the two classes; and although the competition was spirited, the animals in Class I. were, perhaps, not quite so superior in quality as those exhibited last year. The first prize, on this occasion, was carried off by Mr. Twitchell, of Wilby; and the second by Mr. Lynn, of Stroxton. Both the prize oxen were small, but very compact animals. The ox exhibited by the Marquis of Exeter was a very fine specimen, and, had it had another year's feeding, would, there is little doubt, have carried off the prize. This animal, and an ox shown by Mr. Richard Jones, of Woodstone Lodge, were commended by the Judges. The former animal was exhibited at Leicester on Friday, and will be shown at Smithfield next week. In Class II. there were some fine animals. Two shown by R. W. Baker, Esq., and Mr. C. Chapman, of Exton, were purchased by Messrs. Waterfield and Payne, butchers, of Stamford, for slaughtering at Christmas. The bulls, of which there was an excellent show, were much admired. Of sheep the number exhibited was above the average, there being no less than twenty-three pens. In this department the name of Bradshaw was again prominent, Mr. C. J. Bradshaw, of Burley, carrying off the first prize of 10 sovs. for long-woolled fat mutton in Class 15, and the second prize of 5 sovs. in Class 16. The opinion was, that finer or more perfect animals could not be produced: parties present estimated the weight of the first prize-sheep at above 40lbs. per quarter. These sheep are to be exhibited at the ensuing Smithfield Show: those which obtained the

prize in Class 16 were shown at Leicester on Friday. We understand that both the pens which gained the first prizes for wether and ewe lambs were bred from rams hired of Mr. Savile, of Ingthorpe, near Stamford. Some very fine pigs were exhibited, and attracted considerable attention. In extra stock, an in-calf heifer belonging to Mr. Swingler, Langham, was noticed as an extraordinary animal, and was sold for 40 guineas. This beast competed successfully with the heifer which carried off the second prize at Waltham, where the latter had ten competitors to stand against. We must not omit to notice the show of hunting horses, which was also very superior. There were seven competitors, the Marquis of Exeter's prize of 10 sovs. being taken by a horse belonging to Mr. Allsop, of Garthorpe.

Some first-rate vegetables were exhibited, including (as extra specimens) turnips sent by R. W. Baker, Esq. 126 of these turnips weighed 10 cwt., being an average of 9lbs. each.

There was a very large attendance of visitors during the morning; and amongst those present we noticed the Earl and Countess of Gainsborough, Lady Victoria Noel, the Right Hon. Lord Aveland, Geo. Finch, Esq., and Mr. Hy. Finch, the Hon. Colonel Lowther, the Right Hon. Sir John Trollope, M.P., Aug. Stafford, Esq., M.P., the Hon. G. H. Heathcote, M.P., the Hon. G. J. Noel, M.P., the Hon. Hy. Noel, J. M. Wingfield, Esq., R. W. Baker, Esq., H. Lowther, Esq., Colonel Jocelyn, W. H. Baker, Esq., Thos. Syson, Esq., Clark Morris, Esq. (Sheriff), R. L. Bradshaw, Esq., Geo. Saville, Esq., &c.

About twenty labourers, who had obtained prizes for good conduct, &c., were provided with a substantial dinner at the Red Lion Inn, and, at the conclusion of the repast, were addressed in appropriate terms by Aug. Stafford, Esq.

The following is the Award of Premiums:

### STOCK.

To the feeder of the best fat ox or steer, under five years of age, £15, to Mr. J. B. Twitchell, Wilby; second, £7, to Mr. R. Lynn, Stroxton. Mr. Richard Jones, Woodstone Lodge, and the Marquis of Exeter, commended.—Five competitors.

To the feeder of the best fat ox or steer, under four years

of age, £7, to Mr. W. De Capell Brooke, Esq., Geddington Grange; second, £4, to the Right Hon. the Earl of Gainsborough. Mr. C. Smith, Burley-on-the-Hill, commended.—Five competitors.

To the feeder of the best cow or heifer, £10, to R. W. Baker, Esq., Cottesmore; second, £5, to W. De Capell Brooke, Esq. W. R. Morris, Esq., North Luffenham, commended.—3 competitors.

To the feeder of the best steer, under three years of age, £7, to Mr. E. Wortley, Ridlington; second, £3, to Mr. C. Smith, Burley-on-the-Hill.—Three competitors.

To the feeder of the best steer, under two years of age, £5, to Mr. T. Swingler, Langham; second, £3, to R. W. Baker, Esq., Cottesmore. Mr. S. Wallis, Barton Seagrave, commended.—Seven competitors.

To the owner of the best heifer, £6, to Mr. Swingler, of Langham; second, £3, to Mr. J. Woods, of Langham.—Four competitors.

To the owner of the best heifer, under two years of age, £4, to Mr. T. Swingler, of Langham; second, £2, to Mr. C. J. Bradshaw, of Burley-on-the-Hill.—Seven competitors.

Offered by Stafford O'Brien, Esq.

To the owner of the best cow in milk, £5, to Mr. R. Lynn, of Stroxtun; second, £3, to Mr. E. Wortley, of Ridlington.—Three competitors.

Offered by the Society.

To the exhibitor of the best bull, £5, to Mr. T. Suter, of Brook; second, £3, to Mr. R. Lynn, of Stroxtun. Nos. 1, 3, and 5 commended.—Five competitors.

To the exhibitor of the best in-foaled mare, £3, to Mr. T. Dorman, of Langham.—Four competitors.

To the exhibitor of the best yearling gelding or filly, £3, to Mr. A. Shipman, of Eaton Lodge.—Ten competitors.

Offered by the Right Hon. the Earl of Gainsborough.

To the owner (being a tenant occupier of not more than 30 acres of land in the district) of the best cow in milk, to have calved at her full time, &c., £5, to Mr. W. Hubbard, Langham; second, £3, to Mr. J. Edgson, Langham.—Three competitors.

To the owner of the best heifer, under two years and six months old at the time of showing, &c., £4, to Mrs. E. Love, Hambleton; second, £2, to Mr. F. Wright, Egleton.—Six competitors.

To the owner of the best heifer-calf, under six months old at the time of showing, £2, to Mrs. J. Harris, Langham; second, £1, to Mr. F. Wright, Egleton.—Two competitors.

Offered by the Right Hon. Lord Aveland.

To the feeder of the best pen of three long-woolled fat wether sheep, under twenty two months old, £4, £10, to Mr. C. J. Bradshaw, Burley-on-the-Hill; second (offered by the Society) £5, to Mr. E. Wortley, Ridlington.—Five competitors.

To the feeder of the best pen of three long-woolled fat wether sheep, under 22 months old, £7, to Mr. E. Wortley, of Ridlington; second, £4, to Mr. C. J. Bradshaw, Burley-on-the-Hill. Two competitors.

To the owner, being a tenant farmer, of the best pen of five breeding ewes, &c., £4, to Mr. T. Shipman, Croxton Lodge; second, £3, to Mr. R. L. Bradshaw, jun., of Burley-on-the-Hill. Three competitors.

To the exhibitor of the best pen of five long-woolled heaves, one year old, £1, to the Hon. Col. Lowther, Barleythorpe; second, £2, to Mr. R. L. Bradshaw, jun., of Burley-on-the-Hill. Four competitors.

To the exhibitor of the best pen of five long-woolled wether lambs, £3, to Mr. E. Wortley, Ridlington; second, £2, to Mr. C. J. Bradshaw, Burley-on-the-Hill. Four competitors.

To the exhibitor of the best pen of five long-woolled ewe lambs, £3, to Mr. E. Wortley, Ridlington; second, £2, to the Hon. Col. Lowther, Barleythorpe. Four competitors.

To the feeder of the best fat pig, of any breed, £4, to Mr. W. Benskin, Rearsby; second, £2, to Mr. William Carver, Ingarsby. Six competitors.

To the feeder of the best fat pig, of any breed or weight, £3, to Mr. W. Carver, Ingarsby; second, £1, to Mr. Wm. Benskin, Rearsby. Five competitors.

Offered by the Right Hon. the Earl of Gainsborough.

To the owner (being a tenant occupier of not more than 30 acres of land in the district) of the best fat pig of any weight,

£2, to Mr. T. Henfrey, Egleton; second, £1, to Mr. C. Bryan, Ridlington. Four competitors.

Offered by the Society.

To the exhibitor of the best in-igged or suckling sow or yelt, £2, to Mr. T. Suter, Brooke. Four competitors.

Offered by the Most Noble the Marquis of Exeter.

To the owner, being a farmer, who shall exhibit the best half-bred four-year-old hunting mare or gelding, £10, to Mr. Wm. Allsop, Garthorpe; second (offered by gentlemen of the Cottesmore flock), £5, to Mr. T. Shipman, Croxton Lodge. Seven competitors.

Offered by his Grace the Duke of Rutland.

To the exhibitor of the best beast shown as Extra Stock, a Silver Medal, value £3, to W. de Capell Brooke, Esq., of Geddington Grange. Six competitors.

#### VEGETABLES.

Offered by the Right Hon. Viscount Campden.

For Swedish turnips, cultivated on any system, £7, to R. W. Baker, Esq., Cottesmore; second, £3, to Mr. Swingler, Langham. Six competitors.

Offered by the Society.

For mangold wurzel, cultivated on any system, £2, to Mr. Bulviant, Ashwell. Seven competitors.

For cabbages, in quantities not less than one acre, £1, to Mr. Rudkin, Langham. No other competitor.

Offered by R. W. Baker, Esq.

For the best specimen of six Swedish turnips, 10s., to R. W. Baker, Esq.—Three competitors.

For the best specimen of six cabbages, 10s., to Mr. Rudkin, Langham.—One competitor.

For the best specimen of six mangold wurzels, 10s., to Mr. Swingler, Langham.—Three competitors.

The roots generally were commendable.

#### PREMIUMS TO LABOURERS.

Offered by Sir Thomas Whichcote, Bart.

To the shepherd who shall have raised the greatest number of lambs in proportion to the number of ewes put to the ram, 30s., to John Gregg, shepherd to the Hon. Col. Lowther, Barleythorpe; second, 10s. to John Brown, shepherd to W. Fabling, Esq., Burley.—Four competitors.

Offered by the Hon. Viscount Downe.

To the labourer in husbandry who has brought up the greatest number of children, and has never received parochial relief, 2l., to John Burton, of Oakham.

Offered by George Finch, Esq.

Second, 25s., to Wm. Tomlin, North Luffenham; third, 15s., to Wm. Selby, Market Overton.—Three competitors.

Offered by George Finch, Esq.

To the farm labourer who is and has been fully employed the longest time with the least intermission on the same farm, or with the same master or mistress, 3l. 10s., to John Webster, Knessington; second, 2l. 10s., to Charles Coulston, Burley; third, 1l. 10s., to James Cole, North Luffenham; fourth, 10s., to Richard Thorpe, Langham.—Ten competitors.

Offered by the Society.

To the married labourer who has lived the longest period on the same farm as a single man and a hired servant, 3l., to John Barfield, North Luffenham; second, 2l., and third, 1l., divided between John Tyres, Wang, and Henry Smith, Whitwell.—Three competitors.

To the servant in husbandry who shall have lived the greatest number of years in the fewest servitudes, 3l., to John Rogers, of Manton; second, 2l., to George Watson; third, 1l., no competitor.

Offered by the Rev. Edward Brown.

To the team man who has lived with his master the greatest number of years, 3l., to H. Werrington; second, 2l., to John Hercock.

Offered by the Society.

To the servant, being a single woman, who shall have lived the longest time in the same service, 2l., to Sarah Hackett, of Barleythorpe; second, 1l., to Elizabeth Peak.—7 competitors.

Offered by Lord Burghley, M.P.

To the widow of a farming labourer who has brought up

the largest number of children, 3 $\frac{1}{2}$ , to Elizabeth Towell, of Oakham; second, 2 $\frac{1}{2}$ , no competitor.

Offered by the late Rev. E. R. Earle.

To the labourer who has attended his parish church most constantly, 2 $\frac{1}{2}$ , no competitor.

**JUDGES OF STOCK.**—John Manning, Esq., Oringbury, Northamptonshire; Charles Stokes, Esq., Kingstoo, Nottinghamshire; and George Sils, Esq., Honington, Lincolnshire.

**JUDGES OF HUNTING HORSES.**—The Hon. C. E. Freke, Sir J. Trollope, Bart., M.P., and Samuel Hunt, Esq.

**JUDGES OF TURNIPS.**—Mr. Burgess, Ridlington; Mr. Hutton, Tixover; and Mr. Berridge, Barrow.

The DINNER took place at three o'clock in the Agricultural Hall. Augustus Stafford, Esq., M.P., took the chair, and was supported on the right by the Hon. J. G. Noel, M.P., the Hon. G. H. Heathcote, M.P., the Hon. H. L. Noel, and R. W. Baker, Esq.; and on the left by Col. the Hon. S. Jocelyn (of the Scots Fusilier Guards), the Rev. — Beresford (of Wymondham), the Rev. T. Byers, Mr. Adam, Mr. Hough, &c. The company numbered upwards of a hundred. The usual loyal toasts were eloquently given from the chair, and responded to with the utmost enthusiasm.

The CHAIRMAN then rose to propose the toast of the evening, "Success to the Rutland Agricultural Society." Now (said he) we really come to business; and I am going to use the language of the Riding-school of this morning in speaking of the toast. Other toasts were highly commended, but this is the prize-toast—(laughter and cheers)—therefore you must honour it accordingly; and I must say that there seems to have been hitherto some real practical influence in this toast, for I believe it has been given somewhere about five or six-and-twenty times, and its efficacy has been so great that the affairs of the society, the show of the society, and, I may venture humbly to say, the company present at this meeting, have never been surpassed (cheers). Then, if we find that this toast is so successful, we must be sure that we do it full justice now; and if I fail in doing it justice—and very likely I shall fail—you must make up my deficiency, and drink it with the greater enthusiasm if I make a bad speech about it (laughter and cheers). Now, then, with regard to the Rutland Agricultural Society, we find that it does not confine its operations, it does not stint its benignant influences to the little county, but extends them so far beyond the bounds that it crosses the banks of the Welland, and with such effect, that while a member for Northamptonshire has the honour to preside over this meeting, an ox from Northamptonshire has had the luck to win the first prize (laughter and cheers); therefore it becomes us to rejoice as a society, and certainly we have a right to do so. A friend said to me to-day, "The farmers hereabout don't think small beer of themselves" (laughter). And I said, "Of course they don't. Why should they? (continued laughter.) Have you in your travels found the land so ill-drained, have you found the fields so weedy, do you find the stock so bad, that you should consider that the farmers of this locality would be right in thinking small beer of themselves?" (Hear, hear, and cheers.) And I wonder, if the farmers thought small beer of themselves, what the manufacturers would think of them? (Renewed laughter and cheers.) We have been so much run down of late years—we have been so violently abused, that we consider it high time to stand up for ourselves; and stand up for ourselves we will (loud cheers). And in standing up for ourselves we will own that our position was never more satisfactory than at present; for while on the one hand, no class can complain against us, we, on the other hand, have no reason to complain, and are satisfied with the present state of things—with the prices realized by our produce and our stock (Hear, hear). Very well, as everybody is contented, some one

might turn round upon me and say, "What have you got to talk about? Why not drink the toast in silence, and, as 'Benedict' says in the play, Give God thanks and make no noise?" (Laughter). And, to a certain extent, I don't know why we should not do so. But if we choose to have two or three words in a colloquial sort of way, I don't know who should forbid us; and why should we not have a few words socially and pleasantly together? (Hear, and cheers.) Now, gentlemen, I had intended to say nothing to you on the subject on which I spoke at Northampton, and which was under consideration then, and is under consideration now, among the tenant-farmers of this country, and among the landed proprietors of this country also. But a friend of mine, from Ridlington, said, "You must bring forward the question of agricultural statistics." "Well," I said, "it has been worked very much during the whole of this autumn, and, perhaps, the Oakham Agricultural Society might get a little tired of it." "That is not the fact," he said. "Besides, if you don't bring it forward at such an important meeting, the enemy will get hold of it and declare that as the tenant-farmers present were not appealed to on the subject, it might be assumed that they were in favour of the measure proposed by Government." But now I think that the contrary is the fact, and that you do consider that, however desirable it might be to have the details of the agriculture of this country presented to the House of Commons in a popular form, that advantage would not, with your approbation, or with your consent, or with your assistance, be bought at the price of an inquisitorial system, to which no other class of her Majesty's subjects is liable (Hear, hear). Now, with regard to the question of agricultural statistics, the agriculture of this country rests precisely upon the same footing as every other class of the manufacturing industry of this country. We know the imports of agricultural produce; we know the exports of agricultural produce also. They know the import of cotton wool, or they know the export of cotton wool. It is the same with iron; it is the same with every other article. But what would Mr. Turner, or any other respectable shopkeeper of Oakham say, if a Government inspector stepped in and said, "How many yards of calico," or "how many yards of ribbon have you sold during the last six months? Write it down for me, and deliver it, under a penalty?" Then, if the inhabitants of towns would not like that inquisitorial process, why should the farmers be subject to it? for as is the cotton and the ribbons of the haberdasher, as is the iron of the ironmaster, so is the wheat, so is the corn, so is the poultry (and we were to descend even to the ducks and hens) of the farmer. (Hear, hear, and cheers.) And we were to register the results, and have them served up to the Houses of Parliament in a blue-book. Now, I do not wish at all to undervalue the importance of knowing in this great and flourishing community the increase of food raised—the increase, if I may so speak, of agricultural wealth, which is year by year produced in this still more and more fertile island. But as a guide to the agriculturist, as a guide to the corn-merchant, as a guide to the consumer, I believe—so large are our importations of foreign cereal produce—that these agricultural statistics would be of little or no use whatever. (Hear, hear.) As I said before at Northampton I now repeat at Oakham, we have seen practically for several years agricultural statistics collected in Ireland. They are sent over and served up, or rather buried, in a blue-book every year before the House of Commons; but I never yet met with one farmer, or one corn-merchant, or one consumer in Ireland who ever made the least reference to this blue-book in the carrying on of his business, or in the arrangement of his crops. (Hear.) The agricultural statistics which we want would not be the statistics of the past, but, if I may so speak, of the future, and should not have reference merely to England, but to those enormous tracts of corn-growing countries of which we know nothing, except when the cargoes arrive at our ports. (Hear, hear, and cheers.) And why the farmers should be subjected to the process in question, I do not understand, except that there is a class which still cherishes a feeling against us, and which is never happy and never seems to be quite pleased unless it is doing something to tease the agriculturists of this country. (Hear, hear.) Well, if those, or anything like those, are your opinions, it will be your duty to instruct your members on the subject; and I confess I shall be anxious to hear the two honourable members on my right (the Hon. G. H. Heathcote and the Hon. G. J. Noel) give their opinion on the matter.

(Cheers.) Now, Mr. Noel and Mr. Heathcote, you must perceive that the company have responded to my challenge: do you? (Cheers renewed.) Will you, when your turn comes to speak—and I won't much longer trespass between you and the meeting—will you speak out explicitly and fairly, and accept the challenge which I have given? (Hear, hear, and much cheering.) If we are able, as we have been able hitherto, to resist this particular and obnoxious scheme, there are some things which we have not yet been able to do. We have not yet been able to deal with our own barley as we think proper, because of the exciseman. We have not yet been permitted to grow a particular herb which we might grow, because of the custom-house officer (Hear, hear). I pronounce no opinion on the subjects now; but we have always to remind our—what shall I call them? not our friends exactly: I will not call them our enemies—our critics, that it is not with our consent, it is not in consequence of our wish, that such arrangements are at present in existence. But, though we cannot alter these things, though we cannot accomplish thus much, there is much that we can accomplish, there is much that we are accomplishing; and there is much that, I think, we still shall be able to accomplish. And it is societies such as this that carry forward the great work of agricultural improvement. It is societies such as this that do more than carry forward the great work of agricultural improvement: they carry forward and they strengthen those feelings, without which the wealth of a country, far from being its strength, from becoming a temptation to the invader, constitute rather its weakness. It is in the power of societies such as this, it is their most benignant effect, to strengthen the union between class and class; to call forth that love of home and of country which is the strength of every community, and in which every community is strong in proportion as that feeling exists among them. The object of these societies is to bind class to class with chains whose bondage is happiness, and whose links are not the less strong because they are imperceptible. And therefore it is that year after year we welcome these anniversaries with a heartier feeling, and we drink this toast with a warmer wish. The toast means really, "God speed the plough." Whether horses draw it, or whether steam propels it, God speed the plough, for its errand is a blessed one; it has been valued in all ages and in all countries, and it is the emblem of that which is, perhaps, the most precious and the most valuable upon earth. Therefore, gentlemen, may we, and may those who come after us, while they drink a toast which I trust will long be given in the town of Oakham, and long cause the walls of this hall to ring with acclamations, however inadequately that toast may be proposed—may that toast be given, and may that toast be received by those who in their time and in their generation shall combine the acceptance of every new improvement with the cherishing of every good old English feeling; and for ourselves, for this little county, though least not last, may it teach to larger counties—some of them I could name that need the lesson—how to develop the gifts of an indulgent and a beneficent Providence, how to be free from crime, how to be industrious; and, being free from crime, and being industrious, to be as happy and as pleasant as the little county of Rutland. (The chairman concluded amid vehement plaudits, and the toast was drunk with every demonstration of enthusiasm).

Mr. HOUQU proposed, "The High Sheriff of the County." The Hon. J. G. NOEL, M.P., gave "The Marquis of Exeter."

The Hon. G. H. HEATHCOTE gave "The Earl of Gainsborough, President of the Society."

The Hon. G. J. NOEL responded, in the absence of the noble Earl, his father. The hon. member assured the meeting that their President still took as much interest in the prosperity of the society as he did some years ago when he occupied the chair at their anniversary dinner (cheers).

Mr. W. R. MORRIS briefly proposed "The Members for the County."

The Hon. G. J. NOEL was first to reply. He was truly glad that he could congratulate them on the success of this society—now, he thought, in its twenty-sixth year. He trusted it was still in its youth, and that the youngest person present, if he was fortunate enough to live to four-score, might see it then as prosperous as it was that day (cheers). It was also gratifying to find, that not only had they a successful meeting in that county, but that the reports of other similar societies showed a healthy state of agriculture in the country. Those reports also proved that the interest attached to these meet-

ings was in no way diminished. And why should it diminish, when they considered the vast benefit they had conferred upon agriculture, by bringing together practical and intelligent men who could thus impart their experience one to another? He was glad to say that Providence had blessed them with a more than average harvest—a better one than that of last year; and he was given to understand that prices were remunerative, and that, generally speaking, agricultural prospects had not been better for many years past. They heard on all sides of the progress of improvements, of vast sums spent upon guano and other manures, and of fresh acres brought under cultivation. All this, he thought, indicated the healthy state of agriculture, and gave promise of increased resources and increased wealth to the country. And while they thus congratulated themselves, let them not forget others dependent upon them. Having the interests of all at heart, and especially of the labouring classes, let them indeed rejoice at present circumstances (Hear, hear). The honourable gentleman then alluded to the late war, and concluded as follows: There was another topic deeply interesting to agriculturists, and he had been challenged to speak upon it by the hon. gentleman in the chair. He (Mr. N.) thought he ought to be able to gather pretty well the opinion of gentlemen of that county upon the subject when he remembered the numerous-signed petition which had been brought to him. In the prayer of that petition he most cordially concurred (Hear, hear). He thought that the Agricultural Statistics Bill, as presented to parliament, was an insult to the tenant farmers (cheers), and right glad was he to find that that bill was withdrawn. He thought the agricultural districts had spoken out pretty significantly during the last two months, and had condemned most strongly such a prying, inquisitorial, and un-English measure as the one which had been projected. He remembered a speech made by Sir Edward Lytton Bulwer, a short time ago, in which he explained so clearly and so well what the opinions of the tenant farmers were upon the subject, that he (Mr. Noel) hoped all present had read it. Sir Edward Lytton Bulwer said that, out of 19 gentlemen who were examined before the committee of the House of Lords relative to a matter of such interest to the agriculturist, not more than five could be said practically to understand agriculture, or fairly to represent the opinions of the tenant farmers. Was it likely that a satisfactory measure could result from such an inquiry? Sir Edward Lytton Bulwer recommended a conciliatory system of procuring agricultural statistics. Those returns must be given voluntarily; there must be no prying. To a general and proper system, he (the speaker) trusted they would not object, because he believed that the matter derived from these statistics would be most useful and beneficial. There were other topics which presented themselves for consideration, but as that was not a political meeting, he ought not to break the rule. Again thanking his hearers for their kindness, he assured them it would always be his desire to listen to their wishes, and, when he could consistently and honestly, to act upon those wishes; and he should always do what lay in his power to promote the success of the Rutland Agricultural Society (cheers).

The Hon. G. H. HEATHCOTE also returned thanks for the honour they had done him in drinking his health there for the first time as their representative; and he could assure them that it would always be his endeavour to serve them well and truly, and to promote the success of agriculture. (Cheers.) He must congratulate them on the very excellent show they had had that day: it was a satisfactory indication that the Rutland Agricultural Society was most flourishing. While other societies might have failed, this appeared to him only to have gained strength and vigour from age. In several departments of the show, he thought there was a marked improvement, and especially in the class of horses. And he could not imagine why that should not be the case; because, from the high prices horses were realizing, it would pay them well to turn their attention to that class of animals, and try to breed such as he had seen that day. They had had an abundant harvest this year, and he therefore thought that was a good opportunity for carrying on all those improvements which he saw in progress. They saw how necessary it was to bring science and machinery to bear upon agricultural labour. Indeed, he did not know to what length they might go at last: they might perhaps see the steam plough at work in some of their fields by-and-bye. He would now allude to a subject which he felt to be deeply interesting, and upon which he had been asked by the hon. chairman to give his opinion: he alluded to agri-

cultural statistics. He had great pleasure in receiving a deputation from his constituents last summer in London, and in reading the petition they sent up. With that petition he quite agreed, and had the Government bill as it stood then come to a vote in the House of Commons, it was his full intention to have given his opposition to it. (Cheers.) Should any new measure be introduced, he should hope to receive their opinion upon it, and that opinion he was perfectly sure would meet with every attention on his part. He would not, of course—and he thought they could hardly ask it of him—he could not pledge himself to oppose any bill which might be introduced until he saw it: because, if any good and comprehensive measure of this kind could be brought in, he thought it seemed agreed by all parties, even by those gentlemen whom they had always looked up to as the friends of the farmers—and Lord Derby, he thought, was in favour of something of the kind—it seemed agreed that it was desirable, and he thought they could hardly expect him to give a pledge to oppose such a measure. (Hear, hear.) After again thanking his audience, the hon. member sat down amid applause.

Colonel JOCELYN gave "The Health of the Chairman," briefly glancing at Mr. Stafford's noble and disinterested conduct towards our suffering warriors in the Crimea during the winter of 1854, and also adverting to his zealous efforts in Parliament to rectify many abuses connected with the medical department of our army. (The toast was received with loud and long-continued cheering.)

The CHAIRMAN eloquently acknowledged the compliment, remarking that Oakham was the first place in which he ever opened his lips in public, and that he was the only native of the county of Rutland in either House of Parliament. (Cheers.)

Mr. BRADSHAW proposed "The Vice-Presidents," to which the Hon. G. H. HEATHCOTE, as the junior vice-president present, responded.

Mr. BAKER was entrusted with the next toast—"The Judges of Stock." Upon the whole, he had come to the conclusion that this had been rather beyond a fair average show, though perhaps there were particular classes which might scarcely come up to what they had witnessed on some former occasions. They had had animals which had become very eminent at the Smithfield Show; but unless Mr. Bradshaw could do something with his sheep, he thought they could not expect to reap many laurels there on this occasion. With regard to the horses, he thought that considering the small premiums offered for yearlings and brood mares for agricultural purposes, the exhibition had been exceedingly good. The pigs were also very good. About 500 people passed through the show-yard; there had been as many as 800, but they had also sunk down to about 300; so that this might be considered a fair average attendance. With respect to the vegetables, he thought they had never seen such good mangold wurzel and turnips, especially the former, as they had had there that day. (Hear, hear.) Mr. Baker then referred to extravagant statements published in the *Mark Lane Express* relative to the growth of mangold wurzel and Swedish turnips, it being represented that 40 tons per acre of the former and 36 of the latter had been produced upon poor, heathy land in the neigh-

bourhood of Coventry; and in another district that 32 tons 14 cwt. 1 qr. 24lb. of mangold and 41 tons 5 cwt. 2 qrs. 24lbs. of Swedish turnips had been grown. He did not believe such statements as these: they were mere calculations upon weighing small quantities, and as in one of the above cases, as small a quantity as *one perch*. He had upon several occasions weighed *an acre*, well cleaned and fit for consumption. He had heard it from Lord Spencer and Mr. C. Hilyard, that at no time did they find mangold wurzel to exceed 30 tons and swedes 25 tons per acre. His (Mr. Baker's) prize turnips did not exceed 23 tons. The speaker next alluded to the importance of judicious draining, deep ploughing, and the plentiful application of manure. They must have good tillage before they could have good crops. With regard to the alleged abundance of the harvest, he could assure the Chairman of that meeting that it was not an evenly-dispersed harvest over that neighbourhood, because there were parts of the county where the crops of wheat were most abundant, and there were other parts where there was a great deficiency; and it was very difficult to ascertain whether they had a fair average produce of wheat, taking the whole of the county, or whether they had not. He believed it to be a very difficult point. (Hear, hear.) Of barley, there was a very great deficiency in the county. There were not only fewer acres grown, but there was an unusual quantity of black ears or blight. The root crops might be considered as passable, and they had had a good season for grass; but he did think they must not say too much upon the abundance of the harvest. On the whole, however, they were in a prosperous state, and he hoped that all were satisfied and thankful that Providence had placed them upon such a fertile soil. (Cheers.) Adverting to the ploughing meetings they had had, he said that having commenced in 1828, up to 1847, they had brought into the field 1,055 ploughs, and distributed in prizes £817 17s. Three other meetings had taken place: at Casterton in the year 1850, at Uppingham in 1852, and lastly at Oakham in 1853. The total number of ploughs competing at all the meetings was 1,387, and the total amount of prizes distributed £1,019 5s. 7d. Uppingham desired to have a ploughing meeting in their immediate neighbourhood in Oct., 1857. The tradesmen of Uppingham would offer two silver cups to farmers' sons, value £15. (Cheers.) A committee was appointed, with Mr. John Law for their Chairman, and by whom would be collected further subscriptions. He (Mr. B.) had promised to do his best, if in health and strength, to carry it out as upon former occasions—and complete 30 years' assistance in promoting good ploughing in the county of Rutland. (Cheers.) Mr. Baker concluded by proposing the "Judges of Stock."

Mr. MANNING returned thanks, congratulating the society upon its very good show. He did not know that he ever attended a local show where there was greater competition. He should return to Northampton convinced that, though the county of Rutland was small in size, still it was great in spirit and enterprise. (Cheers.)

The proceedings closed about eight o'clock, and the Chairman and his friends retired amid general acclamations, several special cheers being given for the gallant Colonel Jocelyn.

## BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The monthly meeting of the Council of this Society was held on Saturday, the 29th Nov., at Waghorn's Railway Hotel, Taunton; P. Newman, Esq., in the chair. There were present—J. T. Davy, H. G. Moysey, J. B. Knollys, T. D. Acland, W. E. Gillett, R. K. M. King, W. Porter, H. L. Bean, J. W. King, G. Poole, G. H. Andrews, R. Dymond, T. Danger, M. Farrant, W. Wippell, J. Widdicombe, T. Gee, F. B. Morle, T. Hussey, J. Fry, and S. Pitman.

The minutes of the last meeting were read and confirmed. FINANCE.—Mr. Acland brought up the report of the Finance Committee, which showed that the funds were in a prosperous state, there being a good balance in hand.

CHEMICAL.—The same gentleman also moved, and it was determined, that Professor Voelcker, of the Royal Agri-

cultural College, Cirencester, should be invited to deliver lectures on agricultural subjects during the Christmas vacation; and it was referred to the Chemical Committee to arrange the towns in which such lectures should be given, and carry out the details.

MEETING IN SOUTH WALES.—The report of the committee specially appointed to consider the expediency of the Society holding a meeting in South Wales, in 1858, was then taken into consideration; when in consequence of the strong expressions of support, and the importance which numerous influential gentlemen interested in landed property considered that the visit of the Society would be in South Wales, it was resolved to recommend to the annual meeting that the Council consider it to be expedient that the annual meeting of the Society for the year 1858

be held in South Wales; but that, notwithstanding such meeting, the operations of the Society were not to be considered as permanently embracing the district of South Wales.

**NEW MEMBERS.**—The following new members were elected: W. F. Nosworthy, of Manaton, Moretonlampstead; J. Creed, of Whiddon, Abbotskerswell; R. Crocker, of Whimpston, Modbury; Edward Elliott, of Hollowcombe, Embridge; S. Widdiecombe, of Hay, Ugborough; Walter Rendell, of Coombteighend, Teignmouth; Robert Venn, of Collumpton; John Oliver, of Manor House, Bridgewater; F. W. Dymond, of Exeter.

**ADJOURNED ANNUAL MEETING.**—This meeting (being a continuation of the annual meeting held at Yeovil in June last) then took place. In addition to the members of the Council, there were present C. A. Moody, Esq., M.P., president, in the chair, Sir John Duntze, Bart., C. J. Helyar, R. M. King, J. R. Allen, J. Batten, T. C. Colthurst, J. N. Sealy, J. Hannam, E. Ford, and numerous other members. The report of the special committee on the subject of the proposed meeting in South Wales was then

read. The resolution recommended by the Council was then moved—"That it is expedient that the annual meeting of the Society for the year 1856 be held in South Wales"; and after considerable discussion the motion was carried, there being 28 for, and 4 against it. It was also resolved that the rules of the Society be suspended, so as to carry out the recommendation contained in the report of the committee appointed by the Council to consider the expediency of holding a meeting of this Society in South Wales, and to report thereon to the Council at the October meeting. The proceedings then terminated with a vote of thanks to the chairman.

The proceedings of the Council were then resumed; and a communication from the town-clerk of Barnstaple, accompanied with the copy of a resolution passed at a meeting of the Town Council of that borough, inviting this Society to visit Barnstaple, was read. Resolved "that the warmest thanks of this Council be presented to the Town Council of the borough, with an expression of the high sense of honour the Council feel to be conferred on the Society by the above invitation."

CORN AVERAGES.—GOLD.

SIR,—The absence of statistical information, both at home and in foreign countries, as to the result of the last harvest, and the probable demand that may exist for additional supplies to support the population of Western Europe to the harvest of 1857, may perhaps render a return of the weekly average prices of wheat, barley, and oats, for the year ending Michaelmas last, interesting to the agriculturist, as well as useful in arranging corn rents.

The average prices for the year ending Michaelmas, 1856, were:—

	s.	d.	
Wheat.....	73	2 <sup>3</sup> / <sub>4</sub>	per imperial quarter.
Barley.....	39	11 <sup>3</sup> / <sub>4</sub>	" "
Oats.....	25	10 <sup>1</sup> / <sub>2</sub>	" "

While, for the six following weeks, ending 14th November, 1856, the average prices were:—

	s.	d.	
Wheat.....	65	6	per imperial quarter.
Barley.....	44	3	" "
Oats.....	26	5	" "

It appears from the reports this week, from almost all the places of European supply, that prices are rather receding; and, as America has still a large surplus to export, we may reasonably expect that the present price of wheat here will not be exceeded, although it must be admitted that in Paris the price of bread is now nearly the same as in London, and that in Spain and Italy prices range very high in consequence of local deficiency. France and England are both importing countries. According to an account made up annually to October, during the last 10 years, the average importation of wheat (including flour) into England approaches four and a half millions of imperial quarters.

For the six years to Michaelmas, 1856, the imports of wheat stand as follows:—

	Imp. Qrs.	Average price to Michaelmas.	Value.
1851.....	6,073,355	.. 39s. 5d.	.. £11,969,964
1852.....	3,600,521	.. 39s. 10d.	.. 7,171,037
1853.....	6,097,697	.. 45s. 7d.	.. 13,897,667
1854.....	5,536,218	.. 72s. 1d.	.. 20,153,660
1855.....	2,898,876	.. 71s. 10d.	.. 10,411,762
1856.....	4,337,616	.. 73s. 2d.	.. 15,368,445

During the last 40 years, France has been, on the average, an importer of wheat, and during the last few years to a large extent, as may be seen by the following return of the estimated value in sterling during the years named:—

1851.....	£60,000
1852.....	£184,000
1853.....	£4,348,000
1854.....	£6,860,000
1855.....	£4,912,000

The importation of wheat naturally leads to the consideration of the subject of gold and silver, as all great importations occasion a drain of bullion. Such importations cannot be liquidated by the usual current of trade. The adoption of

a gold standard by England and America has been fortunate and will, I feel no doubt, ultimately lead to its introduction into France and elsewhere, as the continued drain of silver to the East, for the purpose of commerce, will render such a measure necessary. The following recapitulation from the Customs department in France will show the progress of the precious metals in that country during the years 1853, 1854, and 1855:—

	Imported.	Exported.	
Gold ..	£47,109,000	£10,500,000	Retained..... £36,609,000
Silver ..	£13,209,600	£32,209,000	Excess of export £19,000,000
Gold and silver taken together in the three years an excess of import of .....			£17,500,000

Assuming this statement to be correct, it is quite evident that the withdrawal of so large an amount of silver from circulation must interfere with the commercial convenience of the country, and eventually lead to the abandonment of a double standard, as no legal restrictions can retain the precious metals against the requirements of commerce. This has been proved in England during the great war at the commencement of the present century. Gold was not then to be obtained but at a high premium, and only in small quantities. The present silver coinage of this country is safe from the demands of commerce until the market price of standard silver exceeds 5s. 6d. per ounce.

It is contended that the increase made to the total quantity of gold in the commercial world does not add to its real worth, as the greater abundance diminishes its relative value, by enhancing the prices of every other commodity valued in gold. However true this may be in the result after a number of years, still the countries producing the gold benefit largely by the stimulus it imparts to trade, to manufactures, and to colonisation. It would be a matter of curious speculation to consider how many years have been anticipated in the progress of Australia. The following abstract of the produce of the gold fields since 1848 may be interesting. More than one hundred millions have been added to that unknown quantity of gold previously existing in the world. The annual produce now begins to form a per centage on that unknown amount, and in a ratio that that per centage must be the slow but certain addition to the money value of all commodities:—

	California.	Australia.	Total.
1848 ..	£12,000	.. —	.. £12,000
1849 ..	1,600,000	.. —	.. 1,600,000
1850 ..	5,000,000	.. —	.. 5,000,000
1851 ..	8,000,000	.. £907,113	.. 8,907,113
1852 ..	11,200,000	.. 9,735,903	.. 20,935,903
1853 ..	12,000,000	.. 10,445,700	.. 22,445,700
1854 ..	13,600,000	.. 9,028,759	.. 22,628,759
1855 ..	12,908,000	.. 11,513,230	.. 24,421,230
	£64,320,000	.. £41,650,705	.. £105,970,705

For the present year there is every probability that the produce will much exceed any former year.

I remain, sir, your obedient servant,  
 CHARLES M. WILlich,  
 Actuary University Life Assurance Society,  
 25, Suffolk-street, Pall-Mall East, Nov. 27.

WEEKLY AVERAGE PRICES OF WHEAT, BARLEY, AND OATS, PER IMPERIAL QUARTER, IN ENGLAND AND WALES, FOR FIFTY-TWO WEEKS, ENDING SEPTEMBER 27, 1856.

Week ending.	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
1855.						
Oct. 6.....	75	6 7/16	37	0 1/2	23	7 9/16
" 13.....	75	7 8/14	38	4 5/11	23	6 5/8
" 20.....	76	10 1/49	33	10 3/35	27	9 8/9
" 27.....	78	4 6/12	33	6 9/17	28	8 8/36
Nov. 3.....	80	3 5/55	39	0 8/17	24	0 9/33
" 10.....	80	5 3/45	39	6 0/16	28	4 9/13
" 17.....	80	10 4/33	39	11 0/70	23	8 0/15
" 21.....	82	1 9/82	40	11 7/83	28	1 4/50
Dec. 1.....	83	1 8/29	42	3 4/42	23	10 8/24
" 8.....	81	6 2/48	42	5 3/32	23	6 8/54
" 15.....	79	11 8/85	41	3 1/69	27	10 0/90
" 22.....	78	9 4/43	40	4 2/15	27	1 7/18
" 29.....	77	2 1/71	39	4 5/56	26	11 8/93
1856.						
Jan. 5.....	76	10 1/35	39	0 5/83	26	9 4/13
" 12.....	76	2 7/65	33	3 2/25	25	11 9/10
" 19.....	76	1 8/83	37	8 4/65	26	7 1/78
" 26.....	76	11 2/25	38	4 9/49	25	8 3/71
Feb. 2.....	75	10 2/17	38	6 2/85	25	5 4/28
" 9.....	73	8 1/34	37	5 8/66	24	6 6/66
" 16.....	71	7 8/36	37	2 2/27	23	10 2/95
" 23.....	69	2 7/28	35	8 8/26	23	6 1/13
Mar. 1.....	69	7 5/54	35	6 5/74	23	9 5/54
" 8.....	69	11 0/32	35	11 6/18	24	1 1/50
" 15.....	67	11 2/69	36	3 8/78	23	2 6/11
" 22.....	67	5 1/71	37	2 3/28	23	2 6/37
" 29.....	69	10 9/48	38	1 8/60	24	0 9/65
April 5.....	69	5 0/43	38	8 5/90	23	6 5/80
" 12.....	68	7 7/21	39	0 3/26	23	8 2/71
" 19.....	69	0 9/36	39	9 7/85	23	7 7/77
" 26.....	67	11 3/29	39	11 4/99	23	4 3/29
May 3.....	66	6 8/72	40	5 2/24	22	9 2/65
" 10.....	67	7 2/64	40	3 9/22	23	10 7/70
" 17.....	68	9 6/23	40	0 7/93	23	5 9/97
" 24.....	69	2 2/46	39	6 4/65	25	10 8/17
" 31.....	68	2 4/43	39	11 9/98	23	10 4/10
June 7.....	67	9 8/33	38	7 1/59	24	3 1/82
" 14.....	68	1 3/53	38	6 5/65	24	3 5/82
" 21.....	69	11 0/32	38	4 9/38	24	7 3/90
" 28.....	72	6 2/14	38	5 8/81	25	9 2/70
July 5.....	74	7 2/43	39	7 2/82	26	1 9/89
" 12.....	76	3 5/19	40	2 9/85	24	11 3/94
" 19.....	76	3 9/91	40	4 8/71	26	11 8/35
" 26.....	77	5 1/56	41	9 1/61	27	2 0/69
Aug. 2.....	77	10 5/60	42	7 6/80	27	9 8/47
" 9.....	76	0 6/42	43	3 0/27	27	1 3/27
" 16.....	71	0 2/23	43	7 5/15	26	3 1/71
" 23.....	68	9 6/78	44	7 8/70	27	11 3/14
" 30.....	70	8 1/11	45	1 1/40	27	0 8/66
Sept. 6.....	73	2 5/12	47	6 1/61	27	4 4/16
" 13.....	69	6 8/14	46	8 9/80	25	10 1/78
" 20.....	64	5 3/79	45	10 1/43	27	2 8/19
" 27.....	61	4 8/79	43	10 1/93	26	7 3/60
52 weeks .....	3808	10 8/49	2079	2 3/66	1346	4 3/15
	73	2 9/77	39	11 8/13	25	10 6/98

GLOUCESTERSHIRE AGRICULTURAL ASSOCIATION.  
 MEETING AT GLOUCESTER.

The second annual exhibition of the newly amalgamated societies of Gloucestershire, was held at Gloucester, on Wednesday and Thursday. The show this week has been pro-

nounced by competent judges the best ever held in Gloucester, excepting of course that of the Royal Society in 1853. The display of cattle was superb, and a vast number of additional sheds had to be erected to provide the requisite accommodation. There was, for Gloucester, an unusually large and fine display of sheep, as well as a very good show of poultry. The following is the award of the judges:—

**SHORTHORNS AND OTHER BREEDS, EXCEPT HEREFORDS AND DEVONS.**—For the best bull, above two years old, £10, Mr. Thomas Morris, Maisemore; for the second best, £5, Mr. J. H. Langstone, M.P., Sarsdon; for the best bull, above one and under two years old, £10, Mr. Richard Stratton, Broad Hinton; for the second best, £5, Earl Ducie; for the best bull, cow, and offspring, £10, Mr. Richard Stratton; for the second best, £5, Mr. J. H. Langstone, M.P.: *the whole of this class was highly commended.* For the best cow, in calf or in milk, £5, Mr. J. W. Brown, Liffcote; for the second best, £3, Mr. R. Stratton. Mr. Langstone's cow was *highly commended*; Mr. Morris's *commended.* For the best pair of heifers, under three years old, bred by the exhibitor, £10, Mr. Richard Stratton; for the second best, £5, Mr. Edward Bowley, Siddington; for the best pair of breeding heifers, under two years old, bred by the exhibitor, £8, Mr. Richard Stratton. Society's Premium. For the second best, £4, Mr. J. W. Brown, Liffcote: *the whole of this class was commended.*

**HEREFORDS AND DEVONS.**—For the best bull, above two years old 10L, Mr. J. E. L. Hewer, jun., Vein House, Hereford; for the second best, 5L, Mr. W. Taylor, Shewls-court. For the best bull, cow, and offspring, 10L, Mr. Edward Price, Pembridge; for the second best, 5L, Mr. W. Taylor, Shewls-court. For the best cow, in calf or in milk, 6L, Mr. James Ackers, Priuknash Park; for the second best, 3L, Mr. John Smith, Sevenhampton, Andoversford. Mr. Powell's *highly commended*; *the whole of this class commended.* For the best pair of heifers, in calf or in milk, under three years old, 10L, Mr. Walter Maybery, Brecon; for the second best, 5L, Mr. James Ackers, Priuknash Park. For the best pair of breeding heifers, under two years old, 8L, Mr. Ackers; for the second best, 4L, Mr. W. Percy, Chelstey. Mr. John Smith's heifers, Sevenhampton, *commended.*

**FAT CATTLE.**—For the best fat steer, of any breed, 6L, Mr. Richard Stratton; for the second best, 4L, Earl Ducie. Mr. W. Hewer's steers *commended.* For the best fat cow, having had a calf, 6L, Mr. Richard Stratton; second best, 4L, Mr. Edward Price.

**SHEEP.—Long-wools.**—For the best ten breeding ewes, not more than thirty-five months old, 10L, Mr. William Smith, Bibury; for the second best, 5L, Mr. Beale Brown, Ilampen. *The whole of this class commended.* For the best ten breeding theaves, not more than twenty-three months old, 10L, Mr. W. Smith, Bibury; for the second best, 4L, Mr. W. Slatter, Stratton. For the best ten ewe lambs, not more than eleven months old, 5L, Mr. W. Smith.

**SHORT WOOLS.**—For the best five breeding ewes, not more than thirty-five months old, £5, the Duke of Beaufort; for the second best, £2 10s., Mr. Edward Holland; for the best five breeding theaves, not more than twenty-three months old, £5, the Duke of Beaufort; for the second best, £2 10s. Mr. Thomas Pope, Ilorningham.

**CROSS-BRED.**—For the best five breeding ewes, not more than thirty-five months old, £5, Mr. Charles Randall, Chadbury; for the best five breeding theaves, Mr. Charles Randall; second best, Mr. S. Davis, Sevenhampton.

**FAT SHEEP.—Long Wool:** For the best three-shear hog, not more than twenty-three months old, £6, Mr. W. Slatter; for the second best, £3, Mr. W. Hewer; for the best three fat ewes, £5, Mr. Slatter: *this class highly commended.*

**FAT SHEEP.—Cross Breed:** For the best three-shear hog, not more than twenty-three months old, £6, Mr. Charles Hobbs, Maisyhampton; for the second best, £3, Mr. Samuel Davis, Sevenhampton.

**PIGS.**—For the best three fat pigs, of the same litter, £5, Mr. Jno. Beach, Redmarley; for the best boar pig under a year old, £4, Mr. Thomas Blandford, Widhill; for the best boar pig more than a year old, £1, Mr. Thomas Pope, Ilor-

ingham; for the best three sow pigs, of the same litter, £3, Mr. Edward Drew, Calesti, Kingscote; for the best sow pig, £3, Mr. Edward Bowly.

**HORSES.**—For the best mare and foal for agricultural purposes, £8, Mr. Samuel Bidmead, Bisley; for the second-best, £4, Mr. J. G. Attwater, Hallingwood Farm, near Cheltenham. For the best stallion for agricultural purposes, £10, Mr. R. Biddulph, Ledbury. For the best filly for agricultural purposes, £5, Mr. Sannel Bidmead; for the second-best, £3, Edward Holland, M.P.

**ROOTS.**—For the twelve best swede turnips, £1, Mr. William Surman, Maisemore; Mr. William Moore, of Hanley Castle, and Richd. Stratton, *highly commended*, and Mr. C. Lawrence, *commended*. For the twelve best mangel-wurzel,

£1, Mr. Richard Stratton. For the twelve best carrots, £1, Mr. Edward Bowley. For the twelve best cabbages, £1, Mr. Charles Lawrence, Cirencester. The carrots shown by Mr. J. C. Hayward, *highly commended*.

**WHEAT.**—For the best sack of white wheat, grown in the year 1856, £2 10s., Mr. W. Surman. For the best sack of red wheat, ditto, £2 10s., Mr. Thomas Morris, Maisemore.

**CHEESE.**—For the best cwt. of thick cheese, £5, Mr. John Ellis, Longdon; for the second-best ditto, £2 10s., Mr. Martin Neale, Berkeley; the cheese shown by Mr. E. Leonard, of Dursley, *commended*. For the best cwt. of thin cheese, £5, Mr. John Harris, Dursley; for the second-best ditto, £2 10s., Mr. Martin Neale. The cheese shown by Mr. Josh. Bailey, of Berkeley, *commended*.

## DRAINERS' SUPPER.

Mr. Scott, estate and land agent, of 5, Charing Cross, having lately employed in the drainage of several estates, in the neighbourhood of Crawley, Sussex, a large number of men, gave 150 of them a supper on Saturday evening last, at three different houses, 50 of them being presided over by himself at the Towner's Inn, Staplefield, near Cuckfield. The estates drained by Mr. Scott in that immediate neighbourhood are those of D. Drakeford, Esq., G. Harrington, Esq., Capt. Cazelet, and C. Taylor, Esq.; and the system he pursues is that of deep draining, four feet and upwards, at various distances, according to soil. He describes the geological strata as the Hastings-sand formation, specially requiring deep draining from the prevalence of water resting on the subsoil. The principal obstruction he meets with, is from sandstone rocks, that rather interfere at times with the course of drains. It is greatly to his credit that he has principally employed local labourers in carrying out his works.

In the evening Mr. Scott took the chair, and in his address said: As they had finished their work, he wished to address a few words to them before they parted. He said he had had 100 Sussex labourers employed under him, and highly complimented them for their readiness and skill exercised in the performance of the work. He depended much on the accuracy of his pipelayers, and was pleased to say that one of the men so employed was a local man (Bristow), a trustworthy hand, and one he could depend on. He then went on to describe how, without care, drains in these soils become choked with sand, and showed the superiority of deep draining over shallow in this particular. He was convinced that deep draining was the thing, a fact that could be seen by the most casual observer who visited those estates where it had been done.

**A LABOURER:** We have seen enough, sir, to know that deep drainage is the best.

**MR. SCOTT:** I thank you for that observation, and I thank you all for the way in which you have done your work. He wished the labouring men to think as he thought, and to act strictly up to his instructions, and then they could go on together in unity. He thought he could depend on those he now addressed to carry out his work to the letter, for he believed they *understood* it; and if they chose to follow him, he would endeavour to find them constant employment. At the present time he had several hundred men and boys under him, and his payments for this week alone in that county amounted to £510. For five months in the year their chance of getting work was uncertain; but if they came to him they should not want for work, and they knew they could earn good wages (cries of "We know that," "We will come," and cheers). He had drained 100 acres for Mr. Taylor, at Ifield, in sixteen days, and many of them were at work there; and he was much

pleased to tell them the observations made by a lady: Mrs. Taylor said—"These labourers of yours act like gentlemen. I have watched them from my windows, early and late, and have not seen an improper action or heard an improper word; not a man behind his time; they come orderly and leave orderly; and there is no going to the public-house at night." This was much to their credit, and he was highly gratified to hear it. It is said by some that the foundation of real agriculture is draining; he was draining on his own account, and knew that it was the foundation of good farming, the means of reclaiming the soil so as to secure good crops, and the more corn grown the more labour was required on the land. In short, draining was the very beginning of good farming, for few farmers failed to follow it up with other improvements, which they could not have ventured upon with undrained land. Mr. Scott then gave some estimates of expenses, and showed the per-centage gained by a tenant after paying his landlord a per-centage on the outlay. All improving farmers found this payment the cheapest rent; and they were now few and far between who were unwilling to have the work done for them on reasonable terms. He again promised the men employment if they would go with him, saying he had contracts on which he could employ 500, and wished it was 5,000, and so satisfied was he with their conduct and character that he would not wish to leave them ("Thank you, sir") He then alluded to the state of the land at Aldershot Camp. Twelve months ago he had offered to drain the camp-ground, and had again lately offered to drain 1,000 acres at £5 an acre, but no notice was taken of it; and there have been our brave soldiers who fought at Sebastopol, lying in a quagmire that is undrained, subject to damps and cold, and to miasma. Is it not a shame to treat our brave fellows in this way? ("It is.") Yes, men, it is; and yet in one week I could put on a thousand men, and lay the swamp dry. (cheers) Last year I drained the estate of the Hon. Mrs. Bathurst, adjoining Chobham Camp (where Lord Seaton, the general then in command, resided), and which is similar in soil to Aldershot; and I know I could do the work for the money I have stated, and at once and for ever put an end to any more "Shivers from the Camp" appearing in the *Times* (laughter and cheers).

The health of Mr. Scott was proposed, and drunk with three times three, some excellent remarks being made by a labourer.

Mr. Scott returned thanks, and proposed the health of Mr. Norman, the superintendent, which was received with enthusiasm. Several other healths were drunk with the honours, including "The Press." The reporter, in acknowledging the toast, advised the labourers to take Mr. Scott's offer, telling them it was much better than getting back to the parish, as draining not only found them good employment, but improved the land so as to insure increased work for all hands, should they wish again to recur to their old system of labour.

After doing honour to the health of Mrs. Gard, the landlady, and family, the party broke up in good time and in good order.



## THE SMITHFIELD CLUB FAT CATTLE SHOW. THE EXHIBITION OF STOCK.

It is not our intention this year to enter so much into detail as usual, in giving to our readers a general description of the classes shown in competition for the prizes offered by the Smithfield Club, but we shall content ourselves with a more general outline. We shall, however, endeavour to keep on the same straightforward path we have hitherto trod.

Before proceeding further, we may just notice the great extension in the operations of the Smithfield Club. In looking over the catalogue, one is struck with the great variety into which the classes have, since its establishment in 1798, become divided. This year it numbers 33 classes, besides those of extra stock; and, as prospects of usefulness open out before the Club, the extension is still further widened. Next year it proposes forming some additional classes—one for the Sussex breeds, another for the Polled Scots breeds, and some others. It has also been suggested that a separate class should be formed of the best of all breeds. Of this we would merely say that the Club has, by their gold medals, done much to fill up this apparent requirement, and that exhibitors are very chary in their selection of the classes in which they desire to compete.

The club has done wonders in developing the breeds of cattle, sheep, and pigs. It was not till the year 1803 that Mr. Western took the first prize won by a *shorthorn*—his *black shorthorn cow*. What position do they hold now? Prior to that year the chief of the show consisted of Herefords and Devons; and it was only by degrees that such extraordinary fatness has been obtained, particularly at an early stage in the animal's life. In 1800 it is said that his Majesty showed two oxen from his farm, which were much admired; but the complaint *then* was, that "the society pay much attention to an extraordinary degree of fatness, or these beasts would have had a good chance of carrying the prize from all competitors," his Majesty being too good a judge to throw money away for mere show. It is not *mere* show—we want early development of every class of animals: the greater their propensity to grow and fatten, the more food they produce.

### CATTLE.

**DEVONS.**—Class 1: In this class are some beautiful animals, though not large. Mr. Fouracre's steer is very symmetrical, and evenly fed, and the flesh of excellent quality; chine good, back not quite even, and sides rather flat; frame long and deep; rump long and full, hips too narrow, capital flank and ripping parts, breast-end good, large girth, twist full, and legs short; countenance very pleasing. His Royal Highness Prince Albert's steer is very compact, too small, but

of fine quality of meat. Class 2: In this class Mr. Heath shows a very complete, well-formed animal; his breast-end is not sufficiently prominent; his twist is good, but hips too near. Mr. Coates's steer is a good animal, beautifully fattened. Prince Albert's steer in this class is small, but very full in frame throughout, and of beautiful quality. The Earl of Leicester's steer has a well-formed chine, good bosom, and full-out shoulder; capital brisket; neck rather thin. Mr. Senior's steer is of the good old-fashioned sort, deeply formed in body, but general frame thin, uneven, and bony. Class 3: Mr. Coates's heifer is not well-formed, but of excellent quality; her neck is rather too long and thin, breast full, ribs light, hips not full though broad, flank thin, fattened evenly. Mr. Farthing's heifer has a capital hind-quarter, rather light fore-quarter, but the bosom is good. In class 4 his Royal Highness Prince Albert's cow exhibits a very deep frame on short legs; twist very good, and back well covered; chine not broad enough; and girth not sufficiently expanding. Mr. Ford's cow is very compact and cylindrical in frame, deep and full; neck thin; flank light; her back is very good, hips well out, and good loin; udder very fat.

**HEREFORDS.**—Class 5: In this class Mr. Heath shows a very complete steer, capable of great expansion in every point: he ought to be kept till next show. Mr. Aldworth's steer has a beautifully-developed frame, good throughout; he is very handsome, and deeply ribbed, though his flesh is rather loose. In Class 6 Mr. Naylor's ox carries off the prize: he is exceedingly well formed, and evenly fed; has very broad hips; full purse, not good; twist not good; flank slight; under part deficient; his whole top superb; he is deep through the chine, and has a good bosom; girth, 8 ft. 7 in. Mr. Heath's ox is very fat, and unevenly fed, but his flesh is firm; his frame is deeply formed, with capital breast end; back fat, with a deep accidental indent upon it; girth, 9 ft. 2 in.; his purse is very good. Mr. Webster's ox has a well-formed top; his frame rather deep, and he has a good purse; but his whole frame is too narrow. Mr. Aldworth's ox deserves mention: his legs are short, but his frame is good, being deeply formed and well fed. Class 7: Mr. Heath's heifer is an extraordinary animal; astonishing teats; capital hips, flanks, and thighs, and good level back; chine and shoulder-top not quite full enough; breast-end good and full. Mr. Pitt's heifer stands on short legs; her frame is exceedingly good, breast extra good, and twist capital. In Class 8 Mr. Herbert shows a very good cow, which took first prize at Birmingham: she possesses a long frame, of cylindrical form; extraordinary tuts; good round hips, and wide; capital

top throughout; chine rather slight comparatively, and ribs rather flat; brisket somewhat scant, as is also her under-parts; live weight, 1 ton 1½ cwt.; estimated dead weight, 18 scores per quarter. Mr. Duffield's cow has a nice level frame, and is well fed. Mr. Allington's *old* cow (13 years 5 months) has made herself fat, particularly on her chine.

**SHORTHORNS.**—Class 9: The Duke of Beaufort, as at Birmingham, is again successful with his beautiful steer. He is kindly-looking, with very handsome frame, but he denotes far greater expansion than he now possesses; he has fattened very evenly; the frame, as a whole, is rather too narrow or light for a first-class animal, and would answer fully "making up"; he should be kept longer. Mr. Duffield's steer is in capital form, and his underneath part good; as also his flank, tuts, hips, and ribs; his back fair, but not first-rate. The Marquis of Exeter's steer is a handsome animal, and will come up well next year; for which purpose, as we understand, he returns back. The Earl of Radnor's steer is also very handsome, and well "got up." Mr. Hewer's steer is large, but not in good form. Mr. John Overman's steer has a very deep frame, and is complete in form, but rather short; he is the model of a capital shorthorn steer. Sir W. Booth's steer possesses great merit, but is not according to modern taste, being too long, high, and narrow in frame. In Class 10, Mr. Stratton shows a very capital ox; he is quite a first-class animal, but not so handsome as some of former years, with which, from his prominent position, we would compare him; he has an extraordinary full and prominent breast; deep in girth; chine rather plain; shoulders well formed, and thrown admirably out; loin rather high; good full and fat purse; his girth is 9 ft. 1 in., and estimated weight 22 scores per quarter. Mr. Betts shows a very handsome ox, of almost perfect symmetry; his head and horns fine, and kindly looking; general frame truly cylindrical, of large, deep proportions; he is rather short and compact, and stands low; he is a beautiful roan; girth, 9 ft. 1 in.; he has fattened very evenly. Sir John T. Tyrrell's ox is a very noble animal, with capital forequarters. The Marquis of Exeter's ox is exceedingly well fed; flesh admirably firm; but he is somewhat out of form in his back. Mr. Thompson's ox stands high, has good hips and tuts, and is large for his age. Mr. Gosling's ox is a great beauty, with fine level back, and good frame; he ought to be kept another year. This is a very good class, and worthy of commendation. Class 11: Mr. Armstrong's heifer has a very complete full frame, on short legs, and stands wide; flank rather light and thin. His Royal Highness Prince Albert's heifer is exceedingly well and evenly fed, and is true in frame, deep and full throughout; flank too thin perhaps. Mr. Phillips's heifer has a capital top, good breast, and good hips. Sir Hugh Hoare shows a very small, dwarfish, shorthorn heifer (we were told), very compact: compare this little shorthorn with Mr. Thompson's steer, what a contrast! Class 12: Mr. Stratton is again success-

ful, with a most beautiful cow, both in colour and frame; a deep symmetrical form throughout; head and horns good, with a very handsome countenance; her chine and neck are both slightly defective, being rather too fine in proportion to her general frame, but in every other respect she is nearly perfect; stands wide, and is noble-looking. The Earl Spencer shows a capital cow, with good hips, and large heavy tuts, good chine and back, and she is well fed, but her general form is not truly good. Mr. Phillips shows a very extraordinary cow, with full well-fed frame, compact and of deep cylindrical form throughout; her very form denotes great weight and substance; she possesses great merit, and is of beautiful colour; her width and proportions are truly good.

**SCOTCH OR IRISH.**—Class 13: The Duke of Beaufort's West Highland ox possesses a very deep and handsome frame. Mr. A. Campbell's ox has a long good frame, and is deep in form. Mr. Stewart's ox is a very large and fine animal. Class 14: Mr. A. Campbell's heifer is a pretty little creature, of first-rate quality. Mr. Knowles shows an inferior animal in this class—a bad animal for any class.

**WELSH.**—Class 15: Sir R. B. W. Bulkeley shows a very good Welsh ox, but he is narrow in chine and back, deep in rib but not springing, sides flat. Mr. Williams's ox is of similar conformation: the breed, we think, might be greatly improved in frame by a cross from the Highland breed. Class 16: Mr. B. E. Bennett shows a very good Welsh cow, of similar conformation to the Welsh oxen, but better in chine.

**OTHER PURE BREEDS.**—Class 17: Mr. Gurney's ox (Norfolk polled) possesses a capital frame. Mr. Neames's ox is a very good specimen of the true Sussex breed, possessing a deep well-formed frame, with quality of flesh equal to the Devon ox. Mr. Cox's ox denotes similar good proportions, as does that of Mr. Bolting's. Class 18: In this class Messrs. Goringe show a first class animal, an extraordinary Sussex cow, deep in frame, compact and symmetrical throughout; her twist and tuts good and full. Mr. Cox shows a capital specimen of the old longhorn; this cow has a good forequarter, loin and hips slight, but twist and tuts good. Col. Wyndham shows a good Sussex cow; Mr. Cane also shows a good Sussex cow; both worthy of favourable mention.

**CROSS OR MIXED BREEDS.**—Class 19: Mr. Niblett shows a shorthorn and Hereford steer; a heavy animal, but not true in frame. Mr. Overman's Ayrshire and shorthorn is of good quality of flesh, but is an ordinary animal. Class 20: Mr. J. S. Bull's ox in this class is of deep frame, broad and full throughout. Mr. Naylor's is a capital cross of Scotch and Hereford, as is also the animal shown by Col. Pennant—a West Highland and shorthorn. Mr. Stewart's shorthorn and Aberdeen is a happy combination, being very large and heavy. Class 21: Mr. Cantrell's cow has a good frame, with firm hand. Extra Stock Class: Mr. Cox shows a good long-horn cow, said to be a cross-bred one. Mr. R. Bunter shows a steer without merit. Why? The stewards should have discretion, and use it in re-

fusing admission to common ordinary animals into this splendid annual exhibition, or it may be made an annual market-place. Mr. John Overman shows a very good ox in this class, large and deep in frame; and the Duke of Beaufort exhibits a beautiful West Highland ox, of deep frame, and excellent quality, well worthy of honourable mention.

In our examination of these classes, we came to the conclusion that the Club Show had by no means declined in public estimation, and that the competition in the cattle classes was highly creditable. The Devons are well represented; more substance, perhaps less beauty, than in some years past. Herefords, as a whole, are equal to former years; but no individual animal stands so prominent as to be put into competition with the best of some bygone year, though still highly commendable, and well worthy the Club's best efforts to sustain the breed in all its valuable qualities. The shorthorns are numerous and very good. Mr. Stratton's comes nearly up to the best of any year; and many other animals in these classes possess extraordinary merit. There are also animals in most of these classes we hope to see again: they are not yet fully developed. It is very desirable that they should be exhibited at an early age in a matured stage, but it is wrong to destroy them before their time, ere we have an opportunity to adjudge their full merit. We were pleased to find some animals are to be reserved for such purpose, so as to test hereafter their full capabilities.

### SHEEP.

**LONG-WOOLLED BREEDS (Pens of Three).—Class 22.** Mr. Walmsley exhibits a pen of very superior animals, equal to our best years; they possess beautiful forms, very full in almost every point, with admirable looks; their rumps are rather short, but their hips and loins are wide, thighs and legs good, chines broad, plaits remarkably heavy, girth great, necks good and full, with very ample chest, and deep through from chine, stand wide and well; they have large frames on fine legs; wool fine, and matches well; loins not deeply covered. Mr. Bradshaw's pen possesses nearly equal quality and symmetry, but are not so large; their offal rather finer; wool somewhat heavier; they are very handsome. Mr. Williams's pen are the heaviest-woolled Leicesters that have been shown for some years, and the quality of mutton is good. Mr. Foljambe's three are very complete; full and handsome in every point, quite in character with his well-known flock. The Marquis of Exeter's pen denote much character and profitable attention. Mr. Twitchel's are good, and deserve notice, as do several other pens in this class. **Class 23:** Mr. Bradshaw's three are more symmetrical and handsome than his other lot, with very fine offal. Lord Berners shows an excellent pen of sheep in this class, as are those shown by Mr. Capell Brooke. Some other pens in this class are very commendable.

**LONG-WOOLLED SHEEP, NOT LEICESTERS.—Class 24:** Mr. Slatter's sheep are fair specimens of the Cotswold breed, as are those shown by Mr. Hewer. **Extra Stock:** Nothing worthy of extra notice in this

class of sheep, though many very good animals were shown, principally by the same breeders as in the former classes.

**CROSS BREEDS.—Class 25:** Mr. C. Howard's pen is of extra size, and have good deep frames, with plenty of wool, and fair quality of mutton. Mr. Overman's lot are of superior quality in mutton, and have good frames; the wool fine: this pen, good as they are, do not quite equal those shown by the same exhibitor in former years. Mr. Twitchel's lot are very large, but not good in hand. **Class 26.**—Mr. Overman's sheep in this class are very handsome, and good in quality. The Earl of Leicester's pen are very good, and deserving especial notice. **Extra Stock:** Mr. Hine's is a good compact sheep, with excellent mutton. Lord Berners also shows a good animal in this class.

**SHORT-WOOLLED BREEDS.—Class 27:** The Duke of Richmond takes first prize in this class. The pen is a very superior one. The form of the sheep is nearly perfect, but in some respects they have been slightly improved in appearance by judicious management; their frames are deep and well formed, full, and broad throughout, but they are not very large; they denote good condition, and great inclination to fatten; they have full, broad backs, and loins well covered; their rumps are rather short; but have wide hips, and deep, full thighs and flanks, capital plaits, chines, and chest; necks full and short—this is a decided improvement in his Grace's flock: their looks are very handsome, wool heavy, and of excellent quality, offal fine. They surpass those of former years, from his Grace's well-known flock. The Lord Walsingham takes second prize, and we think for a pen of equally good, and probably more profitable, sheep, being larger in frame; they are exceedingly good, and prove well under careful examination; they are longer in frame than their competitors, stand rather higher, have wider and as good backs, rumps longer and better, and are heavier animals, with equal quality of mutton; their wool is finer, their necks somewhat too long, and rather thin, looks very handsome and good; frames, as a whole, perhaps not compact enough; offal fine. Mr. Rigden's pen are rather smaller, but denote beautiful qualities; their thighs and backs are exceedingly good, and their whole appearance very handsome. Mr. Hayward's, denoting beautiful quality in every respect, are rather smaller. Mr. Kent's are a superior lot, and possess great symmetry and beauty. **Class 28:** The Duke of Richmond is again successful in this class; the sheep are precisely of the same character, but rather smaller than those in Class 27. The same remark will apply to the other exhibitors. Lord Walsingham's are rather larger in proportion. Mr. Rigden's and Mr. Hayward's are similar; the latter of greater beauty and symmetry. Mr. Foljambe's also deserve especial notice. **Class 29:** The Duke is again successful with a pen of very superior animals, of similar contour, but much larger proportions throughout. Lord Walsingham's and Mr. Kent's are also exceedingly good; and Mr. Rigden's are in character as before. **Class 30:** Mr. King's

sheep are very large, but not handsome, heads and ofal coarse and heavy; their weights alive 308lbs., 287lbs., and 285lbs. respectively. Mr. Canning's pen are very large, of great substance, but not much wool. Extra Stock: Mr. Rigden's ewe is very complete and beautiful. The Duke of Richmond's wether is a first-class animal. Lord Walsingham has another good sheep here; as has also Mr. Kent. Mr. H. Overman shows a large good ewe in this class. In review, we think the majority of the sheep classes have in former years been better represented, but in one or two of the Down classes they are fully equal to former years. The show of sheep, as a whole, is very superior, and highly creditable to the Club's efforts to improve the breeds of all kinds of sheep likely to produce the greatest amount of food for the community.

#### P I G S.

Class 31: In the Pig classes we have not much to notice. Mr. Coate is again a successful exhibitor in two classes. Mr. Williams, Mr. Hall, Mr. Biddel, and the Rev. John Holmes are the other successful exhibitors, and, with one or two partial exceptions, the stock shown have been all of the small breed. Mr. Holmes's was the largest pen of three; their estimated weight 38 stones of 14lbs. each. Mr. Crisp also exhibited a very fine sow of the *small breed*, weighing alive 7 cwt. 2 qrs. 8½lbs. He was offered, in our hearing, £19 10s. for her by a butcher. His Royal Highness Prince Albert, the Earl of Radnor, Sir John Cathcart, Bart., Lady Pigot, Stewart Marjoribanks, Samuel Druce, and other well-known men, exhibited some very fine animals, which our limited space forbids us to notice more at length.

The Club is just now much pressed to open classes for other breeds of cattle, and a committee is appointed to take the subject into consideration, and to mature a plan for that purpose. We would also suggest to this committee the necessity of including other breeds of sheep into their consideration. We should like to see the Cheviot, the Exmoor, and the mountain breeds represented here. The Society has long ceased to favour any particular breed of animals; and we therefore commend these breeds of sheep to their especial attention, as worthy of that encouragement such an acknowledgment would naturally afford.

### A W A R D O F P R I Z E S.

#### F A T C A T T L E.

##### J U D G E S.

Mr. J. BODLEY, Stockley Pomeroy, Crediton, Devon.  
Mr. W. F. HOBBS, Boxted Lodge, Colchester.  
Mr. CHARLES STOKES, Kingston, Kegworth, Notts.

#### D E V O N S.

DEVON STEERS, not exceeding 3 years old.

First prize, £25, and Silver Medal as breeder—Mr. Thomas White Founacre, Durston, Taunton. Purchased by Mr. Barton, Basingstoke.

Second, £10—His Royal Highness Prince Albert. Purchased by Mr. Jeffery, Foubert's place, Regent-street.

*Highly commended*—Mr. William Heath, Ludham Hall, Norwich.

DEVON STEERS OR ONEN, above 3 years old.

First prize, £25, and the GOLD MEDAL, as the best steer

or ox in any of the classes—Mr. William Heath, Ludham. Silver Medal to the breeder—Mr. John Passmore, Bishop's Nympton, South Molton. Purchased by Messrs. C. and G. Davies, Black Bull, New Cattle Market.

Second, £10—Mr. John Coate, Hamnoon, Blandford. Purchased by Mr. Oxley, Richmond-road, Bayswater.

*Highly commended*—His Royal Highness Prince Albert. Purchased by Mr. Jeffery, Foubert's place, Regent-street.

*Commended*—Lord Leicester, Holkham, Norfolk. Purchased by Mr. Stevens, Oxford.

DEVON HEIFERS, not exceeding 4 years old.

First prize, £15—Mr. John Tucker, Yard Farm, Staple-grove, Taunton. Silver Medal to the breeder—Mr. Thomas Chard, Haydon, Taunton. Purchased by Mr. Stuckey, Nottingham.

Second, £5—Mr. Robert Farthing, Farrington Farn, North Petherton, Bridgewater. Purchased by Mr. W. C. Saunders, Corner of Half Acre, Old Brentford.

DEVON COWS, above 4 years old, that must have had at least one live calf.

First prize, £20—Mr. John Ford, Jun., Rushton, Blandford (7 years old, had three calves). Silver Medal to the breeder—Lord Portman, Bryaunstone, Blandford.

Second, £10—His Royal Highness Prince Albert (7 years old, had 4 calves). Purchased by Mr. Charles Frampton, Wimborne, Dorset.

*Commended*—Mr. John Dawbin, Stawell, Bridgewater. Purchased by Mr. J. T. Burge, Bristol.

[Only three entries.]

#### H E R E F O R D S.

HEREFORD STEERS, not exceeding 3 years old.

First prize, £25—Mr. William Heath, Ludham. Silver Medal to the breeder—Mr. Samuel Walker Urwick, Ludlow.

Second, £10—Mr. William Aldworth, Frilford, Abingdon. Purchased by Mr. Robert Greening, Oxford.

*Highly commended*—Mr. Isaac Niblett, Brood Street, Bristol. Purchased by Mr. J. T. Burge, Bristol.

The whole class *commended*.

HEREFORD STEERS OR ONEN, above 5 years old.

First prize, £25—Mr. John Naylor, Leighton Hall, Welshpool. Silver Medal to the breeder—Mr. Walter Maybery, Brecon.

Second, £10—Mr. William Heath, Ludham. Purchased by Mr. S. Muon, Croydon, Surrey.

*Highly commended*—Mr. William Aldworth, Frilford, Abingdon. Purchased by Mr. Robert Greening, Oxford.

*Commended*—Mr. James Webster, Peakirk, Market Deeping. Purchased by Mr. Blishen, Kingston, Surrey.

HEREFORD HEIFERS, not exceeding 4 years old.

First prize, £15—Mr. William Heath, Ludham. Silver Medal to the breeder—Mr. William Tudge, Ashford, Ludlow.

Second, £5—Mr. George Pitt, Chadour Court, Leominster. Purchased by Mr. J. M. Smith, Westbury, Wilts.

HEREFORD COWS, above 4 years old, that must have had at least one live calf.

First prize, £20—Mr. Edmund Herbert, Powick, Worcester (6 years old, had four calves). Silver Medal to the breeder—Mr. Daniel Burnett, White House, Turnaston, Hereford. Purchased by Mrs. Patrick, Worcester.

Second, £10—Mr. Charles Duffield, Marcham Park, Abingdon (4 years old, had one calf). Purchased by Mr. Copeland, Abingdon.

*Commended*—Mr. Henry Abingdon, Little Barford, St. Neots.

[Only three entries.]

#### S H O R T - H O R N S.

SHORT-HORNED STEERS, not exceeding 3 years old.

First prize, £25—The Duke of Beaufort, Badminton. Silver Medal to the breeder—Mr. George Sainsbury, The Priory, Corsham.

Second, £10—Mr. Charles Duffield, Marcham.

*Highly commended*—The Earl of Radnor, Coleshill House, Highworth.

*Commended*—Mr. John Overman, Burnham Sutton, Burnham Market. Purchased by Mr. Isaac Snape, Threc Colt-street, Limehouse.

**SHORT-HORNED STEERS OR OXEN**, above 3 years old.

First prize, £25, and Silver Medal as breeder—Mr. Richard Stratton, Broad Hinton, Swindon.

Second, £10—Mr. E. L. Betts, Preston Hall, Maidstone. Purchased by Messrs. Dear and Burckett, West-street, Maidstone.

*Highly commended*—Mr. John B. Twitchell, Wilby, Northampton. Purchased by Mr. Death, Victoria-road, Pimlico.

*Commended*—Mr. Robert Lyun, Stroxtun, Grantham. Purchased by Mr. Blankley, Brampton, Hunts.

**SHORT-HORNED HEIFERS**, not exceeding 4 years old.

First prize, £15—Mr. John Armstrong, Palterton, Chesterfield, Derby. Silver Medal to the breeder—Executor of the late H. Champion, Raunby House, Retford, Notts.

Second, £5—His Royal Highness Prince Albert. Purchased by Mr. Lawrance, Windsor.

*Highly commended*—Mr. Charles Duffield, Marcham.

*Commended*—Mr. Joseph Phillips, Ardington, Wantage.

**SHORT-HORNED COWS**, above 4 years old, that must have had at least one live calf.

First prize, £20, Silver Medal as breeder, and GOLD MEDAL as the best heifer or cow in any of the classes—Mr. Richard Stratton, Hinton (5 years old, had two calves).

Second, £10—The Earl Spencer, Althorp Park, Northampton (6 years old, had one calf). Purchased by Mr. Francis Spicer, Southampton.

*Highly commended*—Mr. Joseph Phillips, Ardington.

**SCOTCH OR IRISH STEERS OR OXEN**, of any age.

First prize, £20—The Duke of Beaufort, Badmington.

Second, £5—Rev. Joseph Arkwright, Mark Hall, Harlow, Essex. Purchased by Mr. Ferris, Bath.

*Highly commended*—Mr. Alexander Campbell. Purchased by Mr. John Gibbs, Leamington Spa.

**SCOTCH OR IRISH HEIFERS OR COWS**, of any age.

The prize, £10, and Silver Medal as breeder—Mr. Alexander Campbell, Monzie Castle, Crieff, Perth. Purchased by Mr. John Gibbs, Leamington Spa.

**WELSH STEERS OR OXEN (RUNTS)**, of any age.

First prize, £20—Sir R. B. W. Bulkeley, Bart., Baron Hill, Beaumaris. Silver Medal to the breeder—Mr. Hugh Jones, Bodfeirig, Aberffraw, Anglesey. Purchased by Mr. Smith, King's-road, Chelsea.

Second, £5—Mr. William Williams, Plasgwyn, Pentraeth, Anglesey. Purchased by Mr. T. B. Gardener, West Brompton.

**WELSH HEIFERS OR COWS**, of any age.

The prize, £10—Mr. B. E. Bennett, Marston Trussell Hall, Theddingworth, Northampton. Silver Medal to the breeder—Owen Owens, Briant, Menai Bridge, Anglesey. Purchased by Mr. Thomas Johnson, Bermondsey.

**STEERS OR OXEN**, of any pure breed (except Devons, Herefords, Short-horns, and Scotch, Welsh, or Irish), of any age.

The prize, £10—Mr. Robert Neame, Hernhill, Feversham, Kent. Silver Medal to the breeders—Messrs. Charles Neame and Sons (Sussex). Purchased by Mr. Alfred Curling, Feversham, Kent.

*Highly commended*—Mr. Thomas Barton, Bexhill, Battle (Sussex). Purchased by Mr. G. Wellard, Hastings.

*Commended*—Mr. William Thomas Cox, Spondon Hall, Derby (Long-horn); purchased by Mr. George Page, Cross-street, Hoxton New Town. Mr. William Botting, of Westminster Place, near Hurstperpoint (Sussex); purchased by Mr. H. Tupper, Brighton.

**HEIFERS OR COWS**, of any pure breed (except Devons, Herefords, Short-horns, and Scotch, Welsh, or Irish), of any age.

The prize, £10, and Silver Medal as breeders—Messrs. J. and P. Goringe, Tilton, Selmeaton, Lewes (Sussex). Purchased by Mr. Sharp, Westera-road, Brighton.

*Highly commended*—Mr. Edward Cane, Berwick Court, Lewes (Sussex). Purchased by Mr. Whittaker, York.

*Commended*—Mr. Josiah Pitcher, Westham, Eastbourne (Sussex).

**CROSS OR MIXED-BRED STEERS**, not exceeding 3 years old.

The prize, £15—Mr. Isaac Niblett, Bristol. Silver Medal

to the breeder—Mr. Thomas Luckley Meire, Cound Harbour, Shrewsbury (Short-horn and Hereford). Purchased by Mr. Banks, St. Neots.

*Commended*—Mr. John Overman, Burnham (Short-horn and Ayrshire). Purchased by Mr. W. Lawrance, Isleworth.

**CROSS OR MIXED-BRED STEERS OR OXEN**, above 3 years old.

The prize, £15—Mr. J. S. Bult, Dodhill House, Taunton. Silver Medal to the breeder, Rev. W. Bernard, Clatworthy, Wiveliscombe (Shorthorn and Devon). Purchased by Mr. Wm. Smith, 85, Southernhay, Exeter.

*Highly commended*—Mr. John Naylor, Leighton (Scot and Hereford). Purchased by Mr. Wm. Bunkall, Downham, Norfolk.

*Commended*—Honourable Colonel Pennant, Penrhyn Castle, Carnarvon (West Highland and Shorthorn). Purchased by Mr. Collings, Devizes.

**CROSS OR MIXED-BRED HEIFERS**, not exceeding 4 years old.

The prize, £10, and Silver Medal as breeder—Mr. C. S. Cantrell, jun., Riding Court, Datchet, Bucks (Shorthorn and Hereford). Purchased by Mr. Whittaker, York.

## SHEEP.

### LONG-WOOLLED BREEDS.

#### JUDGES.

Mr. J. BODLEY, Stockley Pomeroy, Crediton, Devon.

Mr. W. F. HOBBS, Boxted Lodge, Colchester.

Mr. CHARLES STOKES, Kingston, Kegworth, Notts.

**FAT WETHER SHEEP**, of any Long-woolled breed, 1 year old (under 22 months).

First prize, £20, Silver Medal as breeder, and GOLD MEDAL for best pen of Long-woolled Sheep in any of the classes—Mr. George Walmisley, Rudston, Bridlington, York. Purchased by Mr. J. Saunders, 11, Adam-row, Hampstead-road.

Second, £10—Mr. C. J. Bradshaw, Burley-on-the-Hill, Oakham, Rutland. Purchased by Messrs. Wellbeloved, Kelly, and Dartuall, Welworth.

Third, £5—Mr. G. S. Foljambe, Osberton Hall, Worksop, Nottingham. Purchased by Mr. J. Saunders, New-street, Brompton.

**FAT WETHER SHEEP**, of any Long-woolled breed, 1 year old (under 22 months). Each Sheep not to exceed 220 lbs. live weight.

First prize, £20—Mr. C. J. Bradshaw, Burley. Silver medal to the breeder—Mr. R. L. Bradshaw, Tinwell, Stamford. Purchased by Mr. Wm. Jeffery, Foubert's-place, Regent-street.

Second, £10—Lord Berners. Purchased by Mr. Oxley, Richmond-road, Bayswater.

Third, £5—Mr. William de Capell Brooke, Geddington Grange, Northampton. Purchased by Mr. S. Lane, Luton, Beds.

**FAT WETHER SHEEP**, of any Long-woolled breed (not Leicesters), 1 year old (under 22 months).

The prize, £10, and Silver Medal as breeder—Mr. William Slatter, Stratton, Cirencester, Gloucester (Cotswold). Purchased by Mr. Greenwood, Bagnigge Wells-road.

**LONG AND SHORT-WOOLLED CROSS-BRED FAT WETHER SHEEP**, 1 year old (under 22 months).

First prize, £10, and Silver Medal as breeder—Mr. Charles Howard, Biddenham (Down and Cotswold). Purchased by Mr. John Stevens, Oxford.

Second, £5—Mr. John Overman, Burnham. Purchased by Mr. King, Western-road, Brighton.

*Highly commended*—Mr. John B. Twitchell, Wilby (Down, Cotswold, and Leicester). Purchased by Mr. J. Crook, High-street, Hoxton.

*Commended*—Mr. Thomas Barton, Thrextun, Watton, Norfolk (Southdown and Leicester). Purchased by Mr. Edward Bassett, Crown-court, St. James'.

**LONG AND SHORT-WOOLLED CROSS-BRED FAT WETHER SHEEP**, 1 year old (under 22 months). Each Sheep not to exceed 220 lbs. live weight.

The prize, £10, and Silver Medal as breeder—Mr. John Overman, Burnham (Southdown and Leicester). Purchased by Mr. Wm. Jeffery, Foubert's-place, Regent-street.

*Highly commended*—The Earl of Leicester (Southdown and Leicester). Purchased by Messrs. C. & G. Davis, Black Bull, New Cattle Market.

### SHORT-WOOLLED BREEDS.

#### JUDGES.

Mr. A. DENNAN, Stoneham, Lewes.  
Mr. W. SYMONDS, Milborne St. Andrews, Blandford.  
Mr. R. WOODMAN, Glynde, Lewes.

(These gentlemen also officiated as Judges of Cross-bred Sheep.)

**FAT WETHER SHEEP**, of any Short-woolled breed, 1 year old (under 22 months).

First prize, £20, Silver Medal as breeder, and GOLD MEDAL for the best pen of one year old short-woolled sheep—The Duke of Richmond, Goodwood, Chichester. Purchased by Mr. King, 12, Paddington-street.

Second, £10—Lord Walsingham, Merton Hall, Thetford. Purchased by Mr. Wm. Jeffery, Foubert's-place, Regent-street.

*Commented*—Mr. John Kent, Goodwood, Sussex. Purchased by Mr. Turpin, Uxbridge.

**FAT WETHER SHEEP**, of any Short-woolled breed, 1 year old (under 22 months). Each Sheep not to exceed 200 lbs. live weight.

The prize, £10, and Silver Medal as breeder—The Duke of Richmond. Purchased by Mr. King, Paddington-street.

*Highly commended*—Lord Walsingham. Purchased by Messrs. Comfort and Son, 77, Farringdon-street.

**FAT WETHER SHEEP**, of any Short-woolled breed, 2 years old (above 22 and under 34 months).

First prize, £20, and Silver Medal as breeder—The Duke of Richmond. Purchased by Mr. King, 12, Paddington-street.

Second prize, £10—Mr. Wm. Rigden, Hove, Brighton. Purchased by Mr. Davy, Brighton.

*Highly commended*—Lord Walsingham. Purchased by Mr. Alfred Gorton, Great Windmill-street, Haymarket.

*Commented*—Mr. John Kent. Purchased by Mr. John Stephens, Oxford.

**FAT WETHER SHEEP**, of any Short-woolled breed (not Southdowns), 1 year old (under 22 months).

The prize £10, and Silver Medal as breeder—Mr. William King, New Hayward Farm, Hungerford, Berks (West Country Downs). Purchased by Mr. Wm. Jeffery, Foubert's-place, Regent-street.

*Highly commended*—Mr. W. Brown Conning, Chisleton, Swindon (West Country Downs). Purchased by Mr. Wm. Botterill, Rochester-row, Westminster.

### P I G S.

#### JUDGES.

Mr. A. DENNAN, Stoneham, Lewes.  
Mr. W. SYMONDS, Milborne St. Andrews, Blandford.  
Mr. R. WOODMAN, Glynde, Lewes.

**PIGS** of any breed, above 13 and not exceeding 26 weeks old.

First prize, £10, and Silver Medal as breeder—Mr. J. V. Williams, Haygrove Farm, Bridgewater, Somerset (Improved Leicester). Purchased by Mr. John Lewis, Bristol.

Second, £5—Mr. Richard Hall, Kingsbury Green, The Hyde, Middlesex (Kingsbury Small). Purchased by Mr. Bonny, Caaberwell Gate.

*Highly commended*—His Royal Highness Prince Albert (Windsor). Purchased by Mr. Game, Cannon-street, City.

**PIGS** of any breed, above 26 and not exceeding 52 weeks old.

First prize, £10—Mr. John Coate, Hammoon, Blandford (Improved Dorset). Silver Medal to the breeder, Mr. James Butcher, Jun, Fovant, Salisbury, Wilts. Purchased by Mr. John Lewis, Bristol.

Second, £5—Mr. Manfred Biddell, Playford, Ipswich (Suffolk). Purchased by Mr. Garland, Oxford Market.

*Highly commended*—Mr. Samuel Druce, Eynsham, Oxon (Improved Oxford). Purchased by Mr. H. Castle, 5, Wellisrow, West Brompton.

**PIGS** of any breed, above 12 and under 18 months old.

First prize, £10, Silver Medal as breeder, and GOLD MEDAL for the best pen of Pigs in any of the classes—Mr. J. Coate,

Hammoon (Improved Dorset). Purchased by Mr. Hodges, High-street, Notting Hill.

Second, £5—Rev. John Holmes, Brooke Hall, Norwich (Berkshire and Norfolk). Purchased by Mr. Wm. Gough, 22, Harrow-road, Paddington.

*Highly commended*—Mr. Thomas de la Rue, Drayton Hall, West Drayton (Essex), purchased by Mr. Meidner, 2, Duke-street, Chelsea; and Mr. Stewart Marjoribanks, Busley Grove, Watford (Improved Bushey), purchased by Mr. George Wood, 24, Clipstone-street, Fitzroy-square.

### EXTRA STOCK.

Silver Medal, for the best Beast in extra stock—The Duke of Beaufort (West Highland). Purchased by Mr. Thomas Pawsey, Bath.

Silver Medal, for the best Long-woolled Wether Sheep in extra stock—Mr. George Walsmsley, Rudstone, Bridlington (Leicester). Purchased by Mr. F. W. Wood, Notting Hill Gate.

Silver Medal, for the best Long-woolled Ewe in extra stock—Mr. George Walsmsley. Purchased by Mr. H. Parker, Great Suffolk-street, Borough.

Silver Medal, for the best Cross-bred Sheep in extra stock—Mr. George Hine, jun., Oakley, Bedford (Leicester and Down). Purchased by Mr. T. Eggar, Erith, Kent.

Silver Medal, for the best Short-woolled Wether Sheep in extra stock—The Duke of Richmond. Purchased by Mr. King, 12, Paddington-street.

Silver Medal, for the best Short-woolled Ewe in extra stock—Mr. William Rigden. Purchased by Mr. King, Brighton.

Silver Medal, for the best Pig in extra stock—Mr. John Holdway, Weston, Somerset (Essex).

*Highly commended* in extra stock—Lord Berners' Leicester Ewe, purchased by Mr. F. Langford, 21, James-street, Oxford-street; Mr. J. Overman's cross-bred Wether, purchased by Mr. Sherley, Queen's-terrace, St. John's Wood; and Mr. Marjoribanks' improved Bushey Pig, purchased by Mr. George Stone, Watford, Herts.

*Specially commended*—Lord Walsingham's Southdown Wether. Purchased by Mr. Wm. Stimpson, Wandsworth.

*Commented*—Lord Berners' Down and Leicester Wether, and Mr. Cooke's Improved Dorset Pig. Purchased by Mr. Reed, 19, Marchmont-street, Brunswick-square.

### THE ANNUAL DINNER

Of the Smithfield Club took place on Wednesday evening, at the Freemasons' Tavern, Great Queen-street—the Duke of Richmond, President of Club, in the chair, supported by, amongst others, Vice-Chancellor Kiudersley and Messrs. C. Barnett, R. Milward, H. Wilson, H. Brandreth, R. W. Baker, Professor Simonds, Brandreth Gibbs (Hon. Secretary), Jonas Webb, J. S. Turner, Fisher Hobbs, T. Greetham, E. E. Bennett, W. Sanday, W. Hole, E. Pope, W. Torr, J. Hudson (Castleacre), J. Wood (Chairman of the Central Farmers' Club), W. Baker (Christchurch), W. Rigden, H. Fookes, J. Druce, C. Howard, G. P. Tuxford, H. Corbet, R. Stratton, Wilmore, Heath, Coate, Phillips, &c., &c.

Grace having been sung by the professional singers engaged, The CHAIRMAN said he had to express his deep regret that on this occasion her Majesty and her illustrious Consort had been unable to attend their show-yard as usual. He was sure that her Majesty took the same lively interest as ever in the success of the Club; and it was only in consequence of the death of a near and dear relative, which prevented her Majesty from at present appearing in public, that they had been deprived of her Majesty's presence in their show-yard. From the day that her Majesty came to the throne of her ancestors, she had shown how deeply she sympathised with all classes of her subjects. She had not been satisfied with reports that the welfare of the soldiers who had returned from the Crimea was properly attended to, but she had visited the men in hospital—she had soothed the suffering, and taken every opportunity to show how deeply she had their welfare at

heart. Might God long preserve the life of Queen Victoria he was sure was the prayer of every gentleman present. He begged to give them "The Queen" (cheers).

The CHAIRMAN said, the next toast he had to propose was "The Health of H.R.H. Prince Albert, Albert Prince of Wales, and the rest of the Royal Family." They were all aware that his Royal Highness had for many years been in the habit of sending stock to their show. This year he had not been quite so successful as usual, but he was sure that the support which he had given this and similar institutions was of the greatest value.

The CHAIRMAN: I now rise to propose "The Army and Navy of England," and I am quite sure you will receive that toast in the manner which it deserves. We are all aware of the deeds of heroism which our armies have performed when called upon to risk their lives in the service of their country; but in no instance has their bravery been more conspicuous than during the late war in the Crimea. Exposed to privations of the severest kind—and privations a soldier must expect to undergo when he takes the "Queen's shilling"—in that war our troops behaved themselves in a truly noble and heroic manner. I admit that in the last day or two of the siege, when they were called upon to storm the Redan, they did not succeed in getting into the works; but I myself am an old soldier, and have had some little experience in storming parties, and when I consider the difficulty and danger attendant upon bringing formed bodies up to works which have not been entirely destroyed, my surprise is that they ever succeeded at all. They did their best, however; and hundreds of them fell where British soldiers ought to fall—in the advance, and close to the guns of the enemy. The navy has not, perhaps, received the meed of approbation which is its due; but when I consider that large ships were navigated in the Baltic and Euxine Seas in bad weather with imperfect soundings, I hold that the officers and men of our navy proved in the most convincing manner that they were good seamen; whilst we all know that the gallant and heroic naval brigade fully earned the credit which was awarded to them by their comrades in red. I hope that another war is far distant; but if it does occur, I feel satisfied that the soldiers and sailors of England will willingly risk the sacrifice of their lives for the honour and glory of their country, and the welfare and happiness of mankind (loud cheers). I now call upon you to drink, with three times three, "The Army and Navy of England," including in the toast those brave and honourable men who are serving under the East India Company in the East Indies (cheers).

The CHAIRMAN: The next toast I have to propose to you is "Success to the Smithfield Cattle Club;" and I am sure that in such a company as this it is unnecessary for me to state the reasons why I think that club has proved itself of great importance to the agriculture of our country. You are better judges than I of the stock of sheep and pigs that were shown in your yard during the present week, but perhaps I may be permitted to say that the exhibition is a credit to the farmers of England, and that we have much excellent stock, and less bad than usual. The test of the utility of this and of kindred institutions is to be found not alone in our show yards, but in the market towns on market days. The Smithfield Club is, I am happy to add, in a most prosperous and flourishing condition. It is supported by the tenant farmers of England, and if they do not withdraw their support—and I know they will not—it will continue to flourish with renewed and increasing vigour year by year. Yesterday, in consequence of the prosperous state of our funds, it was resolved by the club to increase the amount of premiums

to the extent of from £200 to £300 a-year, and that sum is to be appropriated to the augmentation not only of the existing premiums, but the number of classes, by including breeds of stock which do not now occupy a place in the show. How the amount will be appropriated is to be decided at our meeting to-morrow, when the committee to which the matter has been referred will make their report. The fact, however, that the club can safely recommend such an expenditure must be satisfactory evidence of the soundness of its finances. I am happy, also, to inform you that we have entered into a very advantageous arrangement with the proprietor of the Bazaar, by which he gives the club £700, and takes the admission fees—the amount being sufficient to show you the great interest which is taken in the show by all classes of society. It shows you also that the club is not of a selfish nature; for Mr. Bulnois would not give the club £700 without he found the exhibition pay him, through the visits of their London and country friends. I now give you "Success to the Smithfield Club," and I hope and trust it may long continue to prosper. (Cheers).

The CHAIRMAN said it had been hitherto their practice to read the list of prizes, but it had been determined, as they were all published in the newspapers, not to do so in future; an arrangement which he hoped would meet with their approbation, as they would thereby be the better enabled to devote the short time they were together to social enjoyment. They would, however, present the gold medals as usual.

The gold medals were here distributed, and the healths of the winners (Messrs. Heath, Stratton, Walsley, and Coate) given from the chair, and duly acknowledged.

Mr. TORR (of Aylesby, Lincoln) proposed "The Successful Competitors in Short-woolled Sheep," and he begged to couple that toast with the name of His Grace the Duke of Richmond, who had so signally and deservedly won so many prizes. As a breeder of Leicester or long-woolled sheep he (Mr. Torr) might fairly say without prejudice, that the Southdown sheep were an *extremely* valuable breed, and had perhaps made greater improvement than any other class of animals at the show. It appeared to him that the Southdown was best adapted to the South of England, whilst the long-woolled sheep were best worth breeding in the North; and in his opinion this was the only fair view to take of these respective breeds. His advice was, "Let every one, in breeding, endeavour to improve nature, but not to alter it." Mr. Torr now had an important addition to make to the toast, which was, to drink the health of the Noble Duke as their President. He could have wished this had fallen into more able hands, but no one could feel more zeal in the attempt to give the health of so good and so great a name. For if they looked back on the Noble Duke, when, as the youthful Earl of March, he followed the great captain of the age through the Peninsula and to Waterloo; or whether they considered him as the faithful councillor of his Sovereigns; or, further, if they thought of him nearer to themselves, as the long-tried friend of the agriculturist—in all these great fields of action they must award him the highest praise, and it might be doubted in which he had gained the greatest renown. But there was no doubt that whatever laurels the Noble Duke had won at Waterloo, or whatever honours he had had bestowed on him by his Sovereigns—as a Lennox in England, or a Gordon in Scotland—none of these would be more lasting than the gratitude of the honest hearts of the British farmers—and for time long to come the household word of "Richmond" would cheer the hearth-stone and roof-tree of many a happy home in England (Cheers). The Noble Duke had long cared-for and fostered the Smithfield Club; and the best evidence of this fostering care was

the present prosperity of the club. He proposed, with all cheers, the happiness and health of the President.

The Duke of RICHMOND, in returning thanks, said that he was always deeply gratified when he gained premiums and medals at this club; but, as the company could bear him witness, he was never depressed when he was beaten. As a landed proprietor he had felt it his duty to turn his attention to agricultural matters, and to the last breath of his life he could never forget the marks of friendship and esteem which he had received from the club, and from the tenant farmers of this country. The gentleman who had proposed his health had alluded to his services in the field under the Duke of Wellington. He felt, on leaving school, that young men of his station were called upon to serve their country. Instead of indulging in the luxuries of London or the sports of the field, he felt he was bound to do his best to promote the comfort of their soldiers, and he trusted that his services had been of some effect. At the close of the war he settled down on his estates, and turned his attention to the study of agriculture. It was most satisfactory to him to preside over the Smithfield Cattle Club, and he rejoiced at the opportunity of meeting them that evening. He had always felt a great desire to take every opportunity of meeting the tenant farmers of England; and he thought that those landowners—if there were any such—who did not mix with the tenantry of the country lost some of the greatest advantages which belonged to the station which they occupied, and the most mighty of kings could not raise their heads with greater pride than might the tenant farmers of England (cheers).

The CHAIRMAN said the next toast he had to propose was the health of the Vice-President and the Trustees. He deeply regretted that Lord Portman was prevented being amongst them that evening by the severe illness of a near relative; and Lord Berners was also unfortunately prevented attending, though that they took the deepest interest in the club there could be no doubt. The only trustee he saw present was Mr. Gibbs, their Honorary Secretary, who had done more to promote the interests of the club than any other man. He was a most active, intelligent gentleman, and had the interests of the club mainly at heart. He was happy to have the opportunity thus publicly of doing justice to one to whom agriculturists owed so much; and he therefore asked them to join him in drinking the health of the Vice-President, Trustees, and Honorary Secretary. (Cheers)

Mr. GIBBS (of Half-moon-street) would be ungrateful indeed if he did not tender them his warmest thanks for the very flattering terms in which his health had been proposed, and the cordial manner it had been responded to. He could assure them also, for the other trustees and the vice-presidents, that they always had the greatest gratification in serving the club to the utmost of their power. He might mention that it was his intention to search over the earlier records of the club, and present the result of his researches in the shape of a pamphlet to each member of the club, believing that it would be most useful as a work of reference. He was glad to see the continued prosperity of the club, which could only be attributed to the great support which they received from the breeders of stock throughout the country. It was gratifying to know also that now the members of the club had free access to the show-yard—a privilege accorded to them this year for the first time. If the club did not make such great strides as the Royal Agricultural Society of England, it was because it was not so comprehensive in its objects, but only attended to one department of agriculture; a department, however, which he considered to be of the greatest importance—the breeding of cattle. Their show was improving year by year; and the

Emperor of the French, and other foreign sovereigns, seeing the usefulness of such societies as the Smithfield Club and the Royal Agricultural Society, were endeavouring to establish similar societies; though he was sure they would never be enabled to show such excellent stock as was produced by the farmers of England (cheers).

Mr. C. BARNETT (of Stratton, Biggleswade) proposed "The Health of the Judges, and Mr. Fisher Hobbs."

Mr. FISHER HOBBS (of Boxted, Essex) returned thanks, and said that, on entering the show-yard on Monday morning, he and his colleagues at once felt that more than the usual amount of criticism would be brought to bear upon their decisions, inasmuch as during the previous week many of the animals had stood together side by side at the Birmingham Show (Hear, hear). They, therefore, entered upon their duties with the determination not to know any of the animals, and solely with the desire of acquitting themselves to the best of their ability. Consequently the expressions of approval which they had heard that night were, as might be supposed, highly gratifying to them (Hear, hear). He felt that the Smithfield Club was now becoming of such national importance that it would be a serious loss, not only to the agriculture of the country, but to the whole consuming populations, if these annual meetings ceased to be held (cheers).

Mr. WILSON (of Sherwood, Mansfield) stated there was another body of men to whom the Smithfield Club owed a debt of gratitude. He was aware of the onerous duties of the judges, but he felt that they were not more so than those of the stewards of the show-yard, who did so much to promote the comfort of every one visiting it. He would give them "The health of the Stewards, and Mr. Greetham."

Mr. GREETHAM (of Stainfield, Lincoln) could assure them that the stewards felt deeply the compliment paid them; and for his colleagues he could state that a more zealous body of gentlemen, or men more deeply anxious to perform their duty, could not be found (cheers).

Vice-Chancellor KINDERSLEY, in proposing "Prosperity to the Royal Agricultural Society of England," said that he would at once candidly avow that he did not belong to the landlord class, for he did not possess nor ever had possessed a single acre of land; nor was he a tenant-farmer, for he had never even mown a blade of grass from any land which he occupied. The interests of agriculture were, however, of a kind which came home to the bosoms of all classes. The foundation of the prosperity of the country must repose upon the agricultural industry and operations of the people of the country. That opinion was not, he was convinced, confined to his own breast, but was universal through the country; and a more striking instance of the existence of such a feeling could not be found than in the fact that the proprietor of the bazaar where the show was now held found it to be to his interest to give so large a sum as £700 a-year in the view of the profit he would derive from the multitudes which would go to the show. The labours of the agriculturists of this country were not confined to the narrow canton of their own soil; but their labours were admired, and were now imitated, by the agriculturists of other countries (cheers).

Mr. BRANDRETH (of Houghton, Dunstable) briefly acknowledged the compliment.

Mr. Jeffreys, of Regent-street, was here announced as the winner of the Butcher's Medal.

The CHAIRMAN said there was no toast of greater importance than that he was then about to give them. They must all feel that they were chiefly indebted to the positions they held through being surrounded by an honest and industrious



population. He felt it was the duty of every man connected with agriculture to endeavour to promote the prosperity of their labourers. To the labouring agriculturists the world owed much; and he had therefore great pleasure in asking them to drink, with three times three, to "The prosperity of the labouring classes" (cheers).

The Noble Duke then quitted the chair amidst loud applause, and the company shortly afterwards separated.

The musical arrangements were under the direction of Mr. Genge, assisted by the Misses Wells, Mr. Perren, and Mr. Smythson.

#### GENERAL MEETINGS OF THE MEMBERS OF THE SMITHFIELD CLUB IN THE SHOW-YARD.

At a meeting of the members of the club, on Tuesday, the Duke of Richmond in the chair, his Grace was re-elected president, and the Marquis of Huntley, the Earl of Hardwicke, Earl Spencer, the Earl of Yarborough, and Lord Berners, as vice-presidents for the ensuing year. Mr. W. Torr, of Aylesby Manor, near Grimsby, was chosen steward of cattle and long-woolled sheep, in the room of Mr. Greatham, and Mr. Jonas Webb as steward of short-woolled sheep, cross-bred sheep, and pigs, in the room of Mr. J. S. Turner.

On the motion of Mr. Chamberlain, it was resolved—

"That, as the annual income of the club has very much increased, the amount offered in prizes be also increased; and that a committee be appointed to confer with the hon. secretary to ascertain the amount which may safely be offered in prizes, revise the prize-sheet, and report the opinion of the committee to the meeting, at one o'clock, on Thursday, the 11th December, 1856, when the meeting shall decide as to the number and amount of the prizes which shall be offered, and make such alterations in the prize-sheet as may be thought proper."

Resolutions, of which notice had been given by Mr. Beazley: "That another class be added for crossed or mixed breeds, to be called—'Class 22, for cross or mixed-bred cows above four years old, a prize of £10; to the breeder of the same, a silver medal.' That the rules of the club shall define what is or what is not a pure-bred animal, or how many crosses constitute a pure-bred beast or sheep, and what qualifies it to be shown in the pure-bred and what in the mixed classes." By Mr. Rigden: "That a premium should in future be given for the Sussex breed of cattle"; and by Mr. A. Campbell: "That there be distinct classes for the polled and horned Scotch cattle," were referred to Mr. Chamberlain's committee.

The three following were at once agreed to:

"That in future the award of prizes, &c., shall cease to be read at the annual dinner of the club, and that, with the exception of the gold medals, no prizes or medals shall be distributed at the club's dinner." Moved by Mr. Brandreth.

"That in future the prize-sheet, with rules, &c., be published in the form of a pamphlet, the detailed accounts of receipts and expenditure added, after the plan of the Royal Agricultural Society; and also that in the next publication there be given a list of present members of the club, and statement of each year's account since the show has been held in King-street." Moved by Mr. Moore.

And "That, in order to prevent disappointment to intending exhibitors, the day for receiving entries be fixed to the same date every year, instead of varying as at present; and that the 1st of November be the day, excepting in any year when the 1st of November shall fall on a Sunday, in which

case the entries shall close on the day after. Moved by Mr. Brandreth Gibbs.

At another meeting, on Thursday, the committee appointed to revise the prize sheet, with a view to increasing the premiums and creating new classes, presented their report, which was received, and the recommendations contained in it adopted. In future, therefore, a third prize of 5*l.* will be given for Devon steers not exceeding 3 years old; a third prize of 5*l.* for Devon steers or oxen above 3 years old; a third prize of 5*l.* to Devon cows above 4 years old; a third prize of 5*l.* to Hereford steers not exceeding 3 years old; a third prize of 5*l.* to Hereford steers or oxen above 3 years old; a third prize of 5*l.* to Hereford cows above 4 years old; a third prize of 5*l.* to shorthorn steers not exceeding 3 years old; a third prize of 5*l.* to shorthorn steers or oxen above 3 years old; and a third prize of 5*l.* to shorthorn cows above 4 years old.

The following new classification of cattle of other breeds than those above enumerated will hereafter be also adopted:

#### SUSSEX BREED.

Class 13.—Sussex steers or oxen, of any age.—The best steer or ox, first prize, 20*l.*; silver medal to the breeder: of the second-best, second prize, 10*l.*

Class 14.—Sussex heifers or cows, of any age.—The best heifer or cow, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

#### NORFOLK OR SUFFOLK POLLED BREED.

Class 15.—Norfolk or Suffolk polled steers or oxen, of any age.—The best steer or ox, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

Class 16.—Norfolk or Suffolk polled heifers or cows, of any age.—The best heifer or cow, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

#### LONG-HORNED BREED.

Class 17.—Long-horned steers or oxen, of any age.—The best steer or ox, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

Class 18.—Long-horned heifers or cows, of any age.—The best heifer or cow, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

The foregoing six classes had previously been included in two, under the general denomination of "other pure breeds."

#### SCOTCH HORNED BREED.

Class 19.—Scotch horned steers or oxen, of any age.—The best steer or ox, first prize, 20*l.*; silver medal to the breeder: the second-best, second prize, 10*l.*

Class 20.—Scotch horned heifers or cows, of any age.—The best heifer or cow, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

#### SCOTCH POLLED BREED.

Class 21.—Scotch polled steers or oxen, of any age.—The best steer or ox, first prize, 20*l.*; silver medal to the breeder: the second-best, second prize, 10*l.*

Class 22.—Scotch polled heifers or cows, of any age.—The best heifer or cow, first prize, 10*l.*; silver medal to the breeder: the second-best, second prize, 5*l.*

#### IRISH BREED.

Class 23.—Irish steers or oxen, of any age.—The best steer or ox, first prize, 10*l.*; silver medal to the breeder. The second-best, second prize, 5*l.*

Class 24.—Irish heifers or cows, of any age.—The best heifer or cow, first prize, 10*l.*; silver medal to the breeder. The second-best, second prize, 5*l.*

The last-mentioned six classes were, under the old regulations of the club, included in two classes only, which embraced both Scotch and Irish breeds.

No alteration is to take place in the prize sheet for Welsh stock; but for cross or mixed breeds a second prize of 10*l.* is to be given for steers not exceeding 3 years old, and a second prize of 5*l.* for steers or oxen above 3 years old.

In the sheep classes, the second prize for fat wethers of any long-woolled breed, 1 year and under 22 months old, is to be increased from 10*l.* to 15*l.*, and the like increase will be made in the premiums for the second-best wethers of any long-woolled breed 1 year and under 22 months old, each sheep not exceeding 220*lbs.* live weight. For long-woolled wethers, not Leicesters, 1 year and under 22 months old, there will be a second prize of 10*l.*, and a third prize of 5*l.*, the first being increased to 15*l.*; long and short-woolled cross-bred wethers, 1 year and under 22 months old, the first prize is increased to 15*l.*, the second to 10*l.*, a third prize of 5*l.* added. For long and short-woolled cross-bred wethers, 1 year and under 22 months old, each sheep not to exceed 220*lbs.* live weight, a second prize of 5*l.* is added.

In the short-woolled classes, a third prize of 5*l.* will be offered for wethers of any breed, 1 year and under 22 months old; a second prize of 5*l.* for those under 22 months old, each sheep not to exceed 220*lbs.* live weight; and a third prize of 5*l.* for fat wethers of any breed, 2 years old (*i. e.* above 22 and under 34 months). The premium of 10*l.*, which has heretofore been given to short-woolled wethers not being South-downs, is now converted into a first prize of 15*l.*; and a second prize of 10*l.* and a third of 5*l.* are added.

The changes to be made with reference to the premiums for pigs are as follows:—

Class 39 will comprise pigs of any breed "not exceeding 4 months old." Class 40, any breed "above 4 and not exceeding 8 months old." A new class, 41, will consist of "pigs of any breed above 8 and not exceeding 12 months old—the premiums to be a first prize of 10*l.* and a second of 5*l.*" And a 4th class, 42, will comprise pigs of any breed "above 12 and under 18 months old," with two similar premiums.

The total increase in the prize list is just under 340*l.*, and the total amount about 1,200*l.*, offered by the club in premiums. This will include some new medals.

Amongst the other business transacted was the leasing of the Show for a renewed term of five years, to Mr. Boulnois, the proprietor of the Bazaar, at an increased rental of £200 per annum.

## THE IMPLEMENT DEPARTMENT OF THE SMITHFIELD CLUB SHOW.

Judging from the number of farmers and others who always crowd the long galleries set apart for the display of agricultural machinery, and from the amount of business transacted on these occasions, alike by our great firms and humbler exhibitors, every one must conclude that the implement department is of great importance, and so valuable an accessory to the fat stock exhibition, that, if no catalogue can be issued of the contents of the stands and stalls, at any rate the Press should publish to the absent portion of the public what was most worthy of note in so large a collection.

The steam-engines and thrashing-machines attracted more than usual attention, ranged in their accustomed corridor below-stairs.

BURRELL, of Thetford, showed a portable engine, fitted with a hot-water cistern and registered apparatus for pumping hot and cold water, by which an alleged

saving of 20 per cent. in fuel is effected. Also a combined thrashing-machine, which obtained a silver medal of the Royal Agricultural Society.

GARRETT AND SONS—a portable engine fitted with Horton and Kendrick's patented fire-box, which, being of a corrugated form, has a greater amount of heating-surface than the plain fire-box, and is also much stronger. A combined thrashing-machine, having an intermediate shaft which receives the power from the engine, and by the necessary riggers and belts drives the drum and other working parts; thus relieving the drum-bearings, &c., from undue wear, and giving a great degree of steadiness to the entire machine. A superiority in this machine is the revolving screen having an Archimidean screw within it, which forms a very simple and easy separator.

WEDLAKE AND DENDY—a portable engine and combined thrashing-machine.

HORNSBY & SON—a portable engine, with cylinder inside the boiler above the fire-box, causing a great saving of fuel; and a combined thrashing-machine, remarkable for the regularity of its winnowing, obtained by means of a screw or worm feeding the riddles, and also for its steadiness, owing to the absence of all rocking motion.

WM. CAMBRIDGE—a portable engine and combined thrashing-machine. The engine-pump is fixed to the chimney, so as to be kept quite hot, and thus insure its working in frosty weather. The machine is remarkably compact in form, and not overloaded with sheaves, spindles, and bearings, as we find to be the case in those of some makers.

TUNFORD AND SONS—an eight-horse prize portable engine, constructed with upright cylinder, the working parts covered in an iron house, and thus protected against the dirt of a farm-yard. The boiler is made with flues and tubes combined, for security against leakage and other contingencies. A combined thrashing-machine with finishing dressing-machine, also effective shaker, simple form of riddle, winnower, and small number of running bearings.

BARRETT AND EXALL—a portable engine, a fixed engine, and combined thrashing-machine.

RANSOMES AND SIMS—a portable engine; and combined thrashing-machine, in which most of the motions are rotary, at once reducing the friction, and greatly lessening the amount of wear and tear, generally found so heavy an item in the economy of such machines.

BROWN AND MAY, of Devizes—a portable engine, and thrashing-machine.

CLAYTON AND SHUTTLEWORTH—a portable steam-engine, of their noted first-class construction and workmanship; and a combined thrashing-machine, with finishing apparatus, the riddles and shaker displaying great ingenuity, with the view of overcoming the difficulties besetting the perfect separation of such heterogeneous and unmanageable matter as corn, chaff, ears, short straws, whiteheads, &c.

HOLMES AND SON, of Norwich—a portable engine and cloverseed drawing and dressing machine.

ROBEY AND SCOTT, of Lincoln—a portable engine and combined thrashing-machine.

Let us now advert to the upstairs exhibition. First we come to

BARTON'S excellent stable fittings; then to WHITMEE'S flour-mills, corn-crushers, &c.

INSKIP, of Potten, showed a "sheep-dressing fork," for securing a sheep by the neck, the iron shaft of the fork being driven like a stake into the ground.

COTTAM AND HALLEN, of Oxford-street—stable-fittings, pumps, &c.

CLYBURN, of 31, Lombard-street—a model of a churn that brings butter in nine minutes, and gathers into a single mass.

COLEMAN—his well-known cultivator; and a novelty in the form of Hanson's patent potato-digger. With this simple and not-inconveniently heavy machine, two horses can take up three acres of potatoes in a day. A share cuts underneath the ridge or row, and then a set of eight forks, made to revolve transversely behind the machine, tears the ridge to pieces, tossing the tubers, with some earth, fibrous roots and stems, &c., upon a net, which perfectly separates the potatoes, leaving them on the surface of the land. The price is £17.

BURGESS AND KEY—an assortment of chaff-cutters, churns, forks, &c., and their prize reaping-machine, with screw-roller platform, for effecting a side-delivery without manual assistance.

HUNT, of Earl's Colne—his excellent cloverseed-drawing and dressing-machine.

CHIVAS, of Chester—a stall of roots and seeds, including specimens of his orange-jelly turnips.

BOBY, of Bury St. Edmunds—a corn-screen of very ingenious construction, perfectly self-cleaning; and a winnowing-machine.

JAMES, of Cheltenham—a good and very simple liquid-manure distributor.

THOMPSON, of Lewes—his Paris prize haymarket, with double-pointed teeth.

BARNARD AND BISHOP, of Norwich—a mill, and specimens of pulped roots produced by their efficient pulping-machines.

COMINS, of South Molton—turnwrest-ploughs, and other implements.

SAMUELSON—a variety of chaff-cutters, mills, crushers, and his unrivalled root-slicer.

SUTTON, of Reading—a stall of remarkably fine roots, grown from seed supplied by this firm.

WILLIAMS, of Bedford—his well-known superior iron-harrows.

LAWSON AND SONS, of Edinburgh—splendid specimens of corn, grass, roots, seeds, &c., and an apparatus for determining the quality of turnips, by their specific gravity.

STANLEY, of Peterborough—steam cooking-apparatus for cattle-food. Uncommonly simple, economical, and strongly constructed.

BENTALL—self-cleaning pulpers, ploughs, and various forms of his inimitable broadshare scarifier and subsoiler.

FISHER, of Thrapston—chaff-cutters, &c., and a model of a novel clod-crusher, consisting mainly of a barrel, or cylindrical cage, of 4 feet diameter, carrying a great number of small discs, which are rendered perfectly self-cleaning by being turned partially round as they rise behind the machine.

STACY, of Uxbridge—chaff-cutters.

THE DUBLIN AGRICULTURAL SOCIETY—a collection of Irish-grown produce, comprising some very interesting specimens of corn, roots, flax, &c., &c.

FRY, of Bristol—a number of Bushe and Barter's excellent root-graters.

SMYTH AND SONS, of Peasehall—different descriptions of drills, for corn, seed, and manure.

BALL, of Rothwell—his prize ploughs.

SAWNEY, of Beverley—his well-known hariff-screen, attached to a corn-dressing machine.

RICHMOND AND CHANDLER—superior chaff-cutters.

REEVES, of Dratton—Chandler's admirable liquid-manure or water drill, that has been very extensively used in all parts of the kingdom, and on all soils, with marked advantage.

W. CAMBRIDGE—his excellent wheel-presser roller.

PATTERSON, of Beverley—compound-action grinding and crushing-mills, the rollers being on oblique axes; and a novel rocking-machine, which acts as a potato-washer, churn, ash-riddle, &c., with the greatest ease.

SMITH AND ASHBY—their patent safety chaff-cutters, horse-rake, and the haymaking-machine which has taken every prize of the Royal Agricultural Society for the last ten years.

SMITH, of Kettering—his very simple and effective horse-hoe.

CROSSKILL—cart, Archimedean root-washer, &c., models of portable railway for farms, waggon, Norwegian harrow, liquid-manure cart; also his new reaper, a great improvement in this class of machines, the side-delivery by means of belts passing across the front of a slanting table or platform, being exceedingly neat, and the mechanism generally very little complicated, and regular in working.

HOLMES AND SON, of Norwich—a variety of drills, &c.

RANSOMES AND SIMS—prize ploughs, subsoilers, crushing and grinding mills, chaff-cutters, barley-awner, cake-breaker, &c.

WHITEHEAD—tile-making machine.

KEEVIL—the new cheese-making apparatus, wonderfully simple and economical.

CARSON, of Warminster—chaff-cutter, &c.

GROVE, of Great Baddow—a show of roots, &c.

BARRETT, EXALL, & Co.—their very compact horse-power, thrashing-machine, chaff-cutters, &c.

NORWOOD, of 16, High-street, Finsbury—crushers, chaff-cutters, &c.

WOODS, of Stowmarket—his excellent pulping-machines, &c.

PARKES—steel digging-tools, &c.

PRIEST AND WOOLNOUGH—Drills and a lever horse-hoe.

IMPEY, of Street—an improved winnowing and dressing machine; very easy to turn, with a large area of sieves and screens; an even feed of corn to the sieves, and drawers underneath to catch the dirt, seeds, &c.

WEDLAKE AND DENDY—a number of chaff-cutters, bruisers, &c., and a fixed steam-engine.

COOPER AND Co., Ipswich—Smith's self-acting counterbalance horse-rake, in which each tooth acts independently, with a balance-weight; the lifting leverage very compact and easy; for some purposes, however, such light teeth would be a disadvantage, instead of an additional facility.

HILL AND SMITH, of Dudley—continuous iron-fencing, chaff-engine, &c.

GODDARD, of Nottingham—a very compact, cheap, and convenient cottage cooking-range; adapted for boiling, baking, roasting, and any kind of culinary preparation, and heating for a great variety of purposes. Price, from £5 upwards.

SKIRVING, of Liverpool—some fine specimens of his swedes and other varieties of roots.

CLAYTON—part of his celebrated brick-making machinery.

TURNER AND Co., Ipswich—their superior corn-crushers.

HORNSBY AND Co.—prize drills for all purposes, winnowing-machines, &c.

THOMAS GIBBS AND Co.—a fine exhibition of seeds, samples, dried specimens, and particularly of roots, some of tremendous size and admirable quality.

GARRETT AND Co.—Chambers' extraordinarily good maure-distributor, their lever horse-hoe, prize drills, &c., &c.

CLAYTON AND SHUTTLEWORTH—a fixed steam-engine, saw-bench, pumping-machinery, &c.

HOWARDS of Bedford—strong as usual in their harrows, prize ploughs, iron harrows, &c.

BIGGS—a curious apparatus for sheep-dipping, consisting of a crane and wicker cradle.

MARY WEDLAKE AND Co.—haymaker, oat-bruisher, and other implements.

BUSBY—prize carts, ploughs, &c.

GEO. GIBBS AND Co.—a magnificent stall of roots, specimens, samples, &c.

DRAY AND Co.—a collection of many different machines and implements, the principal object of notice being the prize reaper; the compactness and lightness of which, compared with those having a self-acting delivery, being a point much in its favour. The tipping platform is very ingenious, and amazingly facilitates the delivery of the bunches of cut corn.

The only representative of steam-ploughing machinery, now awakening public expectation, was Mr. Williams's model, exhibited in operation upon a table covered with loose sand, in a corner of one of the galleries; and very great interest was excited by the ingenious and sanguine inventor's elucidations of its mode of action. The engine and winding-drums are in one frame; and the scarifier, or frame of ploughs, is hauled backwards and forwards between this windlass and a pulley-platform anchored at the other end of the work. For common ploughing, Mr. Williams has four plough-bodies arranged in one carriage-frame, while he employs a horse to steer its course, and help to turn round to the other side of the land or stretch at each end of the field. He has already actually ploughed sufficient ground to show that the work costs about the same price as by horse labour. We think that the number of pulleys, guide-rollers, &c., is too great a source of friction in the machine; whilst the shifting and fixing of the hauling-platform take too much labour to be economical; and the large and extended experiments of Mr. Fowler tell us that only by a lighter and more self-acting description of machinery can an ordinary portable engine be made to plough enough land to counterbalance the expense of shifting to the field, &c. Mr. Williams's ploughing-frame displays good contrivances; and we sincerely trust that he will be able so to modify his system of hauling as to compete ably with Mr. Fowler's, and also Messrs. Fisker's more complete inventions. Mr. Fowler, we hear, is now ploughing for His Royal Highness Prince Albert, at Chater's Farm, Slough, on heavy land, ten or twelve inches deep, contracted for at fifteen shillings per acre.

## THE METROPOLITAN GREAT CHRISTMAS CATTLE MARKET.

MONDAY, Dec. 15.—This being the day appointed for holding the Great Christmas market, no little excitement was observed here throughout the morning, and, indeed, up to quite the close of business. From nearly all parts of the United Kingdom, as well as from the continent, numerous visitors poured in to witness a sight which is without equal in any part of the world, both as regards the weight and quality of the stock brought together—including, of course, their extraordinary number. In the first place, let us do justice to those to whom the arrangements were entrusted. The great additional space in this market, compared with the area of Smithfield, would appear highly favourable for

an improved allotment of the stock—in other words, that each salesman would have ample room afforded him to show his beasts to advantage; but their enormous bulk require more than ordinary space; and, although almost the entire of the “alleys” were filled, no inconvenience was experienced, and the authorities are entitled to great credit for the scrupulous care with which they afforded accommodation to all. In minutely considering the general excellencies of the Beasts shown here to-day, not a few important points suggest themselves. We have had exhibited animals of a first-class character: we have had Devons, Herefords, shorthorns, Welsh, Sussex, and Pembroke runts of enormous weight.

Cross-breeds, too, have been numerous, whilst the Scots have been in proper number. Compared with some former shows, we have observed very great improvements in the condition of the stock not to be despised. Some parties have opposed fat stock exhibitions, on the ground that too much unconsumable meat is produced by them, consequently, that there is a great waste of food. But, if fat stock shows were unprofitable to the grazier, we might venture to assume that these exhibitions would speedily cease, and that their opponents would ere long cry out for "more fat" upon their sirlains. The character of great stock shows is, in a general way, misunderstood by the public. The feeders produce splendid animals frequently at a considerable loss to themselves; but they have ulterior objects in view. How frequently do we find them competing in the exhibition in Baker-street year after year, at an enormous outlay of capital, and how many seasons have they made their appearance there unsuccessfully! But success at length attends them, and, the moment they have gained a prize position, they then look to a certain pecuniary return: that is to say, their stock, for breeding and other purposes, is sought after at a high—certainly an enhanced—price, and thus the consumers have every year had an important addition to the supply of food. In confirmation of this view, we might refer to the high position—gained chiefly through the instrumentality of the Smithfield and other stock shows—of the great breeders of Cambridgeshire, Norfolk, Suffolk, Lincolnshire, Herefordshire, Devonshire, &c. Well, then, as these exhibitions are highly important in more than one point of view, and as every effort should be made to bring into play every breed of stock in the country, it would appear surprising that any description should have ever received less favour at the hands of the Smithfield Club than any other; but every one must feel gratified in learning that very important changes have been made in the rules of that club—that in future Scotch cattle is to be classed separately, and that Sussex stock is to have a similar position. These changes, whilst they will no doubt increase the interest in the show in future years, cannot fail to improve the number and quality of our breeds, and thereby increase the amount of food for general consumption.

The annexed return shows the number of Beasts exhibited on the great days, and the prices obtained for them, in the last sixteen years:—

Year.	Beasts Shown.	Prices.			
		s.	d.	s.	d.
1840	3,528	4	4	to	5 8
1841	4,500	3	8	5	0
1842	4,541	3	4	4	8
1843	4,510	2	8	4	4
1844	5,713	4	0	4	6
1845	5,326	3	6	4	8
1846	5,470	4	0	5	8
1847	4,282	3	4	4	8
1848	5,912	3	4	4	8
1849	5,765	3	4	4	6
1850	6,341	3	0	3	10
1851	6,103	2	8	4	2
1852	6,271	2	8	4	0
1853	7,037	3	2	4	10
1854	6,181	3	6	5	4
1855	7,000	3	8	5	2

YEARLY COMPARISON OF WEEKLY IMPORTS.

	BEASTS.	SHEEP.	CALVES.	PIGS.
1855.....	859	3555	238	—
1854.....	1130	2593	269	7
1853.....	1136	4698	462	20
1852.....	235	3732	419	—
1851.....	607	3155	363	152

The latest advices from Spain and Portugal state that the value of live stock is still on the advance. In the Dutch markets only limited purchases continue to be made, for France; yet, compared with last year, prices continue high.

Even for a great market, we had a very large show of Beasts; and, taking their number and quality collectively, we may affirm that it was never excelled, much less equalled. From the West Country we received 700 Devons; from Scotland, 600 Scots; from Ireland, 200 Oxen; from Norfolk and Suffolk, 800 Scots, Shorthorns, &c.; and from Lincolnshire, Leicestershire, and Northamptonshire, 3,000 Shorthorns. The Beef trade was by no means brisk; and, compared with Monday last, very little change took place in prices. With very few exceptions, the highest quotation for Beef was 5s. per 8lbs.

Amongst the wonders of the Bullock-show we may notice the following: Mr. D. Maidwell had on sale 40 wonderfully prime Scots, fed by Mr. M'Combie, of Tillyfour, N.B.; Mr. Robert Morgan's stand exhibited a remarkably fine number of Beasts, fed by W. Thomas, Esq., of Holbeach; R. Cook, Esq., of Rostians; L. Bird, Esq., of Peterborough; J. Allday, Esq., of Solehill; C. Farrer, Esq., of Spank; Robt. Gillett, Esq., Hallowgate, Norfolk; Messrs. Martin, Knowles, Cooper, Phillips, Mitchell, Stoddart, Kidd, and other large graziers in Scotland. Mr. Collins had a very fine show of Herefords and other breeds. Mr. Vorley's stand was filled with good stock, fed by Mr. Beale, of Huntley, Mr. Walker, of Westerfonray, and other graziers. Mr. Fairbrother exhibited some fine Herefords, the property of Mr. Rowland, of Creslow. The other portions of the supply were very fine, including the stock sent by Prince Albert.

We had a limited supply of Sheep in the market, hence the Mutton trade ruled brisk, at an advance in the quotations of 4d. per 8lbs., the primest Downs having sold at 5s. 4d. per 8lbs. There were no Irish Sheep in the market. Amongst the wonders were 10 Gloucesters, fed by Mr. Ewer, of Northleach; 10 ditto by Mr. Barton, of Fyfield; the same number by Mr. Slatter, of Stratton; and 50 half-breeds, by Mr. Langston, of Oxford. These Sheep were exhibited by Mr. Gurrier. Mr. Weal had 123 Gloucesters, from Mr. Rowland, of Creslow, 23 Downs from Mr. Oakley, of Luton, and other fine lots from various other graziers. Mr. Gland showed some remarkably fine Sheep, fed by Mr. Henley, of Croft, Mr. Chaterton, of Wigtoft, and Messrs. Morley, of Donnington. Some of these Sheep weighed 26 stones each, and realized considerably above £5 each.

We had only a limited supply of Calves in the market. The primest Veal sold briskly, at an advance of 4d. per 8lbs.; otherwise the Veal trade was in a sluggish state, at last week's prices.

The show of Pigs was very moderate. On the whole the Pork trade ruled firm, at very full prices.

## THE SUPPLIES OF MUTTON.

Although beef furnishes the standing dish at our Christmas dinners, yet the prize Southdowns that were exhibited at the great Smithfield market suggest the expediency of a few facts respecting the condition of our mutton. Leaving out of consideration at the present period of the year the fleece, we will confine ourselves exclusively to the carcase. It is remarkable how uniform is the supply of sheep shown at the Smithfield Christmas market. The average of the past seven years has been 23,724 head, and the past two years were nearly equal—22,870. Of about 4,000,000 sheep required annually for the metropolitan supply, more than one-half would seem to be sent up to market slaughtered.

It is not a little remarkable that while the sale of cattle at Smithfield market has steadily increased from 184,524 head in 1844 to 263,008 head in 1854, that of sheep has remained almost stationary. In 1844, 1,609,130 head were sold, in 1854 but 1,539,380. Indeed if we refer back a quarter of a century, we shall find that nearly as many sheep were sold at Smithfield in 1829 as in 1854. Mr. Dodd, in his recent work on the "Food Supply of London," attributes this to an increased supply of country-killed mutton, while the increased supply of beef is in the form of live cattle imported from abroad, and mainly sold at Smithfield. Twenty years ago the sheep were eightfold the number of cattle; now they are less than sevenfold.

Scotland had this year, by the agricultural returns, nearly six million sheep (5,822,478). In Ireland, there were in 1855, 3,598,471, the number then having increased nearly 1,500,000 in four years. England and Wales have probably about 28,500,000 sheep, which would bring the total number in the United Kingdom up to 38,000,000; but we may safely take the whole number at 40,000,000. Average these at 30s. per head, we have an aggregate value of £60,000,000 for the sheep stock of the British Isles. Assuming one-fourth of these to be slaughtered annually, and the average weight to be 80lbs., we have 800,000,000lbs. of mutton supplied to our population annually, worth at the set price about £20,000,000 sterling.

Large quantities of sheep and lambs reach Liverpool from Ireland, the numbers being about 200,000 head per annum, and nearly all these are slaughtered for the consumption of that town: in the Newcastle market the number slaughtered is about 300,000. About 6,000,000 head of sheep are now transported annually from their pasture grounds to the large markets for town consumption. We only commenced to import sheep in July, 1842, upon the repeal of the prohibition, when 650 head came in; but the numbers received from the Continent, it will be seen from the following figures, averages about 200,000 head;

although the imports of sheep are on the decline, while those of cattle are increasing.

The imports in the last six years were—in

	Sheep and Lambs.
1850	143,498
1851	201,859
1852	230,476
1853	259,420
1854	183,436
1855	162,642

Our neighbour France had in 1840 32,151,431 sheep, and killed of these in the year 5,804,700 head; but while the number has not very greatly increased, standing at about 36,000,000, the proportion slaughtered annually appears to have risen to about 8,000,000. In France, however, sheep husbandry is directed more to the production of wool than flesh; hence the return of meat is scarcely half that of our well-fed sheep. If France feeds less sheep than we do, she pastures more cattle. The agriculturists of France have, however, wisely come to the determination that their breed of sheep would be much improved for food by a cross with the English races; and their breeders and graziers have been large purchasers of stock for breeding. During the nineteenth century France has made rapid strides in wool production, and there is little doubt that breeders will now combine the two requisites of flesh and fleece.

Owing to the increase of population in the Australian settlements, the demand for meat necessitates more attention to the flesh as well as to the wool. The recent discovery of several million acres of very fine pasturage in Northern Australia, near the Clarence River, by Mr. Gregory and his exploring party, will have a very beneficial effect, in increasing sheep stock and extending the production of wool, especially to the owners of sheep at Moreton Bay.

The Americans are not fond of fat mutton; a carcase of 50 to 60 pounds is just fat enough to suit the American taste. Of the varieties of domestic animals, the flesh of sheep is that least used in the States, except in a few cities, in proportion to the quantity that might be profitably provided. And yet mutton is perhaps the best kind of meat that can be consumed by a civilized people. New York is beginning to consume large quantities of mutton, 600,000 to 700,000 head, or about one sheep per annum to each of the population, being now the ratio of consumption. Philadelphia slaughters about 100,000 head. In Ohio four or five million sheep are now owned.

Considerable attention is now paid to the rearing of sheep in the United States. The merino crossed with the common breeds is the stock of which the flocks are composed. The high price of wool and mutton has given increased impetus to sheep husbandry in the States; and they have even begun to export sheep and wool to a small extent.

## INTERNATIONAL CATTLE SHOW IN FRANCE.

Amidst the absorbing speculations of political interests, the momentous crisis of the money market, the vicissitudes of Bourse gambings, the questions of European alliances and American elections, it is pleasing and refreshing to the mind to contemplate the steady, peaceful, and persevering efforts of a neighbouring community, with whom a close alliance after centuries of warfare and enmity has so happily joined us, to profit by what good examples we are enabled to exhibit to them, in order to improve their long-neglected agriculture.

It is only a few months since that we witnessed in Paris a Universal Exhibition of breeding stock, the like of which had never been seen before. This was a rare opportunity given to English breeders to establish by a gigantic comparison the super-excellence of their breeds, and this was accomplished in a manner which not only bore immediate fruit by the ready disposal of nearly all the animals exhibited, but which dispersed broadcast all over the world the fruitful germs of a demand which in a few years will not fail to raise stock-breeding in this country to a status of prosperity still unknown in our agricultural annals.

We can assure our readers that this is no idle prediction of ours. We are in a position to know as a certain fact that in the same ratio as the agricultural interest of other nations will develop itself, so will the demand for English breeds increase, because they realize in a greater degree than any other all the received ideas of perfection; and no one can gainsay us when we advance that the principal characteristic of our age—the great fact, which for posterity will stamp it with originality and distinguish it from others, is the recognition by all economists of the paramount—nay, vital importance of agricultural prosperity, and the general efforts of Governments to foster the speedy improvement of that weighty interest, and secure its success.

But, notwithstanding the high position which English breeders have undoubtedly attained at the late Paris Exhibition in the opinion of continental agriculturists, it would be folly to conceal from ourselves that in one respect we have incurred their censure—undeservedly, we have maintained, and still maintain; but nevertheless it is a matter with which we must deal, not by words alone, but by facts, and the French Government is now giving us an opportunity which we hope will not be neglected, to put ourselves right in that respect also with our neighbours.

Almost every writer in the continental papers and periodicals on the late Paris Exhibition, after dwelling at great length upon the excellence of our cattle, hits at last and stumbles at the high condition of our breeding stock. So great an objection is entertained against it abroad, that even the French Government made it a cause of exclusion. This, we feel convinced, is a mistake.

Our neighbours, not having had any opportunities of attending our fat stock exhibitions, evidently can have no idea of what we consider a *fat* condition; and moreover we apprehend that in many cases they are too apt to mistake flesh for fat, and this we saw was the case in several instances of exclusions at the last Paris Exhibition, when several first-class animals, remarkable for their fleshy qualities, were condemned and rejected as being too fat. We consider it, indeed, one of the most commendable points of excellence in our show animals that they can breed, notwithstanding a state of fleshy obesity which, whatever may be said to the contrary, is pleasing to the eye and commending to the animal.

Continental breeders, accustomed to lean beef, long carcasses and rugged surfaces, leggy, unsightly beasts, are naturally shocked by the condition of our neat cattle; and they are wont significantly to point to the portly sides of our Shorthorns and Herefords, and exclaim, "Smithfield! Smithfield!" with the indispensable shaking of the head and shrugging of the shoulders. Now, what we must do is, to show them what Smithfield means with us: then will they stare indeed! Let us send to their Poissy Exhibition a few of our stall-fed oxen. Really, the inducements they hold out to us are magnificent enough: sixty pounds for the first prize, forty-eight for the second, and forty for the third, in nearly every class; besides this, we have gold and silver medals. And in addition to all this, we are especially authorized to announce that a silver vase of the intrinsic value of one hundred guineas, and as a work of art worth one hundred and thirty guineas, will be given for the best English animal exhibited; and another one, worth sixty guineas, to the best lot of English sheep in the yard.

Surely, with such immediate inducements, we hope our feeders will stir themselves in a manner commensurate with the richness of the prizes held out to their ambition. But, besides these immediate advantages, they must not lose sight of the all-important object of dispelling from our neighbours' minds a prejudice which, if not immediately dealt with, may greatly interfere with the foreign demand of our breeds. This observation we principally address to our Hereford friends. We earnestly asked them, after the Paris Exhibition, what they had been about? They most fitly replied by pointing to the exclusions they had been made victims of the year before. Now a golden opportunity is offered them to take a noble revenge, and show the admirable capabilities of their breed for flesh and quality: whilst our Shorthorn men, as well as our breeders of Devons, will vie with each other in the laudable effort of teaching Frenchmen what we really call a *Smithfield* ox.

It is with regret that we perceive that there are no prizes offered for fat cows and heifers. This arises, no doubt, from the unaccountable prejudice of our neigh-

hours against cow beef. On the Paris market it is ranked in the same category as bull beef; whereas it is well known that a fat heifer yields the most tender as well as the most savoury meat. The result of this strange classification is, that fat cows and heifers fetch a much lower price in France than steers and oxen; so that an old bony ox, fifteen or more years old, hardened by many years of field toil, and when no longer

fit for working, half-fed a few months before he is slaughtered, fetches a higher price than a three-year-old heifer, fat, fresh, and healthy.

Such anomalies are certainly most strange, but with these we have nothing to do: it is the French people's business, and not ours. All that we have to do now is, since they seem curious to know what we call beef, by the powers! let them be gratified. T.

## DIBBLING AND DROPPING CORN.

Allow us to propound our remarks, connected with a contemporary's observations, on the inapplicability of dibbling and dropping of corn. It is our own opinion, however, that no method will ever supersede the practice of dibbling, provided it can be dropped properly in equidistant rows. It appears that a newly invented implement, in the shape of a hand-dibbler and dropper—an improvement on Dr. Newington's patented dibble—is about to be introduced and exhibited at the next Grand Smithfield Cattle Show, which will facilitate the dibbling and dropping of wheat in particular, to a very great nicety, at equal distances, varying from one peck to one bushel per acre, according to the will of the operator, or the master who employs him. We are just presented with one of those machines by the inventor, for the express purpose of our testing its merits, or demerits, and reporting upon it, which we hope to be able to do shortly by describing, or showing an uniform plant of wheat produced by it from nearly every perfect grain. It is said to be very difficult to plant as much as one bushel per acre, with one of those efficient implements, though it be set to dib and drop it much closer, from one grain to another, than is thought necessary even by extreme thick seeders. One of the great recommendations of this machine is, that with it the work cannot be slurred over, however awkward and careless the labourer may be who uses it, and cannot avoid depositing the seed at equal distances and at uniform depths, if he works according to the directions. A man, or strong lad, is said to be able to perform one acre a day with more pleasure, comparatively speaking, than he can half an acre with the old-fashioned pair of dibbles, without taking into consideration the trouble and expense of his droppers. The necessary slowness of the operation of dibbling, and the number of hands required to deposit all the seed on a large farm, have hitherto militated against the more general adoption of this much-to-be-approved-of practice. The machines that have been invented to facilitate the process of dibbling, do not appear to have taken with the farmer, or at least to have succeeded so well as might have been expected. It is scarcely within our province to enlarge on this point, but whether it is that the instruments in question cannot accomplish the work they are designed for, or that the labourers cannot be taught or induced to use them properly, does not appear; but we expect the fact is as we have stated. We believe, however, the present practice of a man making the holes, followed by four seed-droppers, to be a most bungling process, and, at all events, a most unsatisfactory mode of proceeding; besides that, little ground is got over in a day, and the work that is done is found, on the seed coming up, to have been executed

in a most irregular and slovenly manner. On making enquiries of many intelligent farmers in Essex, we were given to understand that the number of grains dropped in each hole by the existing method, varied from *nil* up to thirty. This, Heaven knows, is a wide range enough—far too much to be creditable. Yet it is what we might naturally expect. The persons employed in dropping the grain are poor women and children, and as the wages are very trifling, they are obliged to work fast, being commonly paid according to what quantity of ground they get over without regard to the manner in which the work is done; their hands likewise get benumbed with cold, and occasionally some getting behind the rest they are obliged to hurry on; all this is calculated to render the mode of dibbling a very bungling operation. Provided the poor people can get over sufficient ground to enable them to earn their wages, they are, for the most part, extremely indifferent as to how the work is accomplished. In some places, on the seed coming up, large tufts will be presented to the eye, while in others, no seed at all appears to have been deposited. The consequence of this is deplorable. If so many as thirty seeds be huddled together beneath the surface, the roots becoming matted together, will either all perish from fermentation, or otherwise a fine tuft will in due time make its appearance. Now, the farmer is far from feeling thankful for either of these catastrophes—he has almost equal objection to either of them. Take the latter case, which is the worst. In what does this tuft eventuate? For a time they certainly look green and flourishing, and bid fair to become a promising family; but like many other precocious geniuses, whether of the animal or vegetable world, they do not realize the expectations formed of them. Unless this happy family can get food, Death will knock at the door! They, however, run a race for it, and do the best they can on what they can get; by degrees they become more and more puny and unhealthy; at length they turn yellow, and then drop off like rotten sheep! After this hard fight for existence, two or three solitary things are found only to remain! These under favourable circumstances, after a time, contrive to acquire a little strength, and send forth a shoot or too, but owing to their having been starved in their youth, they never really thrive—they never assume the fine healthy appearance they would have done had they started singly, or by twin, or at most three plants, from the beginning. They never, indeed, arrive at maturity; and they certainly do not win in a cauter. We have heard people complain of their seeding being apt to produce an uneven sample. We should say that the example given above is more likely to do so.

HARDY AND SON, Maldon, Essex.



## THE LONDON, OR CENTRAL FARMERS' CLUB,

## DISCUSSION MEETING.

The usual Monthly Meeting of the Club was held on Monday evening, December 8, in the large room of the Club-house, Blackfriars, and very numerous attended. Mr. J. Wood, of Ockley, Sussex, presided, as the Chairman of the year, and amongst others present were:—Lord Berners, Messrs. R. Baker, Jonas Webb, James Thomas, W. Bennett, Owen Wallis, B. P. Shearer, J. Paine (Beds), T. W. Granger, T. Owen, L. A. Cousmaker, T. E. Pawlett, J. Howard, C. Howard, T. Twitchell, J. C. Nesbit, J. B. Spearing, W. Spearing, W. Pile, H. Trethewey, N. G. Barthropp, C. W. Johnson, T. Congreve, J. A. Nockolds, W. Walton, John Thomas, J. Bradshaw, the Rev. T. C. James, W. Cheffins, J. Cressingham, J. Cutts, E. Purser, P. J. Page, C. Stokes, T. Heard, J. Wells, C. Watts, J. Kemp (Lincoln), J. Marshall (Lincoln), B. Smithies, J. Tyler, G. Wilsher, M. Reynolds, G. Rock, T. Chandler, R. T. Deere, Dr. Ellis, W. Bearn, &c., &c.

The Chairman briefly stated that the subject for discussion was "On the Rotation of Crops, more especially as to how far the Four-course System is susceptible of Improvement." Its introduction to the meeting had been entrusted by the committee to Mr. Thomas, of Lidlington Park, Woburn, who no doubt would treat it in the manner that its importance deserved, and he now called upon that gentleman to commence the discussion accordingly.

Mr. THOMAS then proceeded to read the following paper:—When, at our committee meeting last Christmas, I ventured to suggest that the subject of this evening's discussion, viz., "On the Rotation of Crops, more especially as to how far the Four-course System is susceptible of Improvement," was well worthy of the consideration of our club, I did so from a conviction that it was not only a practical subject, but that it was one which hitherto had not received sufficient of our attention, and that the time had now fully arrived when it should be seriously considered how far those stringent agreements, coupled with severe penalties, which are the usual accompaniments to every lease, may now be relaxed with justice to the owner, and advantage alike to the public and producer. We are, I hope, as a nation, making rapid strides towards the true principles of cultivation; and I would fain indulge a hope that the discussions which have been carried on within these walls among practical men may, perhaps, have been one of the no mean causes of this most desirable march. Unlike a neighbouring nation, the agriculture of Great Britain receives from Government no fostering care. It has no Minister devoted to such a department; it has no public fund set apart for its encouragement. But the energy and perseverance of the British farmer compensate for all, and exhibit him to the world the foremost in his class. Perhaps it may be well now to consider how and why

restrictive covenants came to be inserted in agreements, and a positive and unchangeable course of cropping and cultivation insisted on. We will further examine the principles upon which they were founded, the certain advantages which they at first produced, and the serious obstacles which they must present to progressive improvement, should they now, under such altered circumstances, be persevered with. We cannot in this country date any improved agriculture from a much earlier period than the close of the last century. During the reign of George II. the major part of England was in an open field state, the agriculture was barbarous, the crops scanty, and the stock unimproved. The joint cultivators of these open fields, when perhaps a farm of 100 acres lay in fifty different spots, were no doubt anxious to make the most of the land which the circumstances afforded and their limited agricultural knowledge permitted; they appear then to have been unanimous in agreeing to a rotation of two crops and a fallow. No doubt this was decided upon, partly because they expected in the fallow season to destroy some of the filth with which their undrained land was infested, but chiefly in the delusive hope that fertility might be again restored by the disintegration of the soil, and enable them again to persevere in their unsound course. Disappointment, however, was the result. They had to learn that however well fallowed a field might be, the atmosphere could not return to it, in a single year, a sufficient amount of nitrogen to enable it to produce undiminishing crops for the following two. Probably the farmers of that day were unacquainted with ancient literature, or they might have known that the same principles had proved a perfect failure near 2,000 years ago. It was the invariable custom of Roman agriculture, during its zenith, to take a crop but every other year; the alternate one was devoted to making a clean fallow. And we have no reason to doubt, after reading the masterly directions for such work as have been left by Cato, Pliny, Varro, and other Roman patricians, that it was performed in an inferior manner to what it is with us at the present time, and yet we find them constantly complaining of their diminishing produce, and the cause of this puzzled them sorely. But this at least they have left to us—that under this course of cropping the produce of their wheat crop diminished between the time of Varro and that of Columella from 23 bushels per acre to about 12. If such, then, was the result of alternate husbandry, what could be that which adopted two crops and a fallow? The inference is, that at the time of the vast enclosures of Great Britain most of the common fields had arrived at a degree of poverty which could not be exceeded, and produced crops which, under that system, could not be decreased. A change became indispensable. In the reign of George II., or less than

100 years from this time, we read of whole communities in a state of absolute starvation, and, in their anguish and despair, attacking and plundering alike the stores both of millers and farmers; and committees of both houses of the Legislature were frequently appointed to inquire into the cause of the scarcity. One would have thought that, with such a state of agriculture as I have described existing, it would have required no gifted sage to have explained the cause; but at all events it was reserved for the British farmer to provide the remedy. I believe I am only doing justice to our friends north of the Tweed, if I state that it was the agriculturists of that country who, at the close of the last century, took the lead in those vast improvements which began to distinguish our husbandry. They observed that the same crops, repeated consecutively, became smaller and smaller in their produce; whilst with intervening crops of clover or roots, they became increasing; and this led them to the conviction which the science of chemistry has now elucidated, that cereals and bulbs each extracted a different substance from the soil, and that this extracted matter, whatever it was, was in time restored, either by the effect of the atmosphere, or the agency of manure. The researches of the agricultural chemist were then unknown, but the idea was correct in the main; and thus first arose the famous agricultural system of alternate corn and green crops, which has now so long maintained its ascendancy. The rotation of cropping which on strong lands in Scotland first obtained, and still retains the greatest favour, is the six course—always premising that the land must be first made dry by draining—usually commencing with fallow, or fallow crops, such as tares or coleseed, wheat, beans, barley, clover, and wheat. It is sometimes altered to fallow, wheat, clover, oats, beans, wheat; but by some there is an objection to this course, from the bean crop being so late in the rotation as to cause more difficulty in keeping it clean. But, if a landlord will insist that his tenant shall be bound down to one course of cropping, perhaps none better than one of these two could be found. The cultivation of the turnip soils of Scotland may be included with those of England. Whilst this energy was being displayed by our northern friends, enterprise and experiments were not wanting in England. J. W. Coke, afterwards Earl of Leicester, had succeeded to his vast estates in Norfolk, where a soil naturally poor only produced the poorest crops when their cultivation was attempted, but the greater part presented only sterile sheep-walks, or were devoted to the purposes of the warren. His active and energetic mind deplored such a state of things, and he resolved upon improvement. He saw that the soil wanted solidity before it would yield productive crops of corn, and the turnip and clover crop seemed to afford a remedy. And hence sprung the famous rotation of turnips, barley, clover, and wheat, which appeared for many years to promise unparalleled and permanent success. The Swedish turnips, then called *ruta-baga*, were then first introduced to this country. Red clover had been but little cultivated; and the invariable luxuriance of these two crops, and also of the corn crops which succeeded them, seemed to point out the Norfolk system as one without a rival. Was it to be wondered at, then, when landlords beheld

the gigantic improvements which were here displayed, that they were anxious to introduce the like into their respective estates; and when they found persuasion unavailing, to compel their tenantry to improve by coercion? There can be no doubt but that when the stringent covenants and restrictions to which I have had so often to allude were first introduced, both their object and their tendency were to introduce an improved system of agriculture; but it has at last broken down, after holding its supremacy over half a century; and, indeed, that it contained the germs of its own dissolution was clearly seen many years back by the late Sir J. Sinclair, and many other eminent agriculturists. I know not how the case may be in Norfolk; but this I do know, that in every part of England with which I am intimately acquainted there is one universal lamentation over the difficulties which the system now presents. The swedes, though more certain of obtainment than they once were, through the agency of peculiar manures, are yet subject to strange and inexplicable diseases; sometimes resulting, as was the case last year, in the total ruin of the crop. The barley, where the crop of swedes had proved large, and had been fed on the ground with the addition of cake or corn, we find in fruitful seasons laid flat on the ground; and when a period of wet takes place at the time of harvest, seriously sprouted, even before touched with the scythe; the grain unfit for the maltster, and the straw valueless as fodder. The farmer then finds that his young clovers have been killed by the lodgment of the barley crop; the next year produces him either an inferior crop of hay or a scanty run for his flock; and the succeeding one yields him but an inferior crop of wheat, for every practical man knows how much the produce of this crop, when it succeeds clover, is influenced by the degree of fertility in its predecessor—occasioned, no doubt, by the amount of roots left in the ground, as has been so accurately pointed out in more than one lecture of our friend Mr. Nesbit. Let us endeavour now to ascertain the cause of this disease among the swedes (the cause of the frequent failure of the remaining three crops I have already alluded to), and then see if we can throw out some hints for an improvement of the rotation. That when a longer period than four years elapses between the crop of swedes the crop is usually found to be heavier, and success more certain, is well known. A remarkable instance of this I may quote, as taking place in a parish adjoining the one in which I reside. At the close of last year, my neighbour, Mr. A. W. Crouch, in common with the rest of us, lost almost the entire crop of a fine piece of swedes in a certain large field, by some inexplicable disease; but across this large field was a broad belt of magnificent swedes totally uninjured by decay, and presenting a marvellous contrast to their decayed and offensive neighbours. What was the cause? Each part of the field had been manured alike, and each acre had received the like attention. The secret was this—four years previously this belt of sound bulbs had been preceded by mangold wurtzel; the remainder of the field had at the same period been cropped with swedes. Our friend Mr. Joseph Paine has told me that the same phenomenon occurred on the occupation of a near relative

of his, and I have witnessed it in other places as well. Let us, at least, gather something from these remarkable facts. Now, sir, whilst I am going to propose to your notice alterations which I believe would prove very beneficial, I am not going to assert that they are correct. Were I to do so, I should be running into the very error which I am so anxious to correct. My great object in introducing this subject is, as I have already said, not to lay down a rule, but to inquire whether a freer exercise of his judgment should not be allowed to a diligent and intelligent occupier. The fixed routine which many are compelled to adhere to is often pointed at with a sneer by the mechanic and manufacturer; and they inquire, "Who among us would found their practice upon the custom of fifty years since?" The market-gardeners, too, of Fulham and Battersea well know how necessary it is to grow that for which they have the best sale; and maintain that; whilst they can command an unlimited supply of manure, a peculiar rotation would be no better than sheer nonsense. Let us now suppose that we change the rotation from the four to a five course; and that it be turnips, wheat, barley, clover, and wheat. Its advantages would be these: in the course of twenty years it would be found that the four crops of swedes, each at five years' distance from each other, would have produced a greater aggregate amount of food than five crops would have done, each four years distant from the other, and that the bulbs would be much freer from either disease or failure. I then propose to take a crop of wheat as our Scotch brethren almost invariably do; we know by practice that our ordinary wheats succeed remarkably well when sown after turnips up to the middle of February. We have, then, the Talavera, and other more prolific Spanish wheats, to fall back on; and, lastly, the April wheat, which may be sown with security up to the 1st of May. I may here mention in parenthesis that a remarkably good farmer (now I am sorry to say no longer a member of this club), and who adopts the rotation we are discussing—I mean Mr. Shaw, of Cotton End—sows much of the wheat drilled after turnips with Italian ryegrass, for the keep of his couples during the month of March, and, ploughing this land about the 1st of April, sows it with barley and the ordinary clover seeds. It is, however, very doubtful whether the Italian ryegrass could be introduced in this manner to any large extent. Next, then, in order to the wheat, comes the barley—the proscribed act—two white straw crops together. The experience of every one who has tried this tells him that this is the very mode to obtain a fine sample of malting barley; and, as there appears to be no prospect of a remission of the malt tax, this, to those who cultivate the grain, is a great object indeed. But I do not propose to sow this second white straw crop without bestowing upon the land some nitrogenous manure. I should do it in the form of guano. Our friend Mr. Mechi would, no doubt, do it with liquid manure. Perhaps either means would answer the purpose, but I agree with the late Mr. Pusey, "that liquid manure is a pretty toy, but solid dung is for farming in earnest." By guano I of course mean genuine Peruvian, and not the worthless trash which is,

under that name, vended by hosts of unprincipled dealers, whose advertisements crowd the columns of our agricultural periodicals. I read in the report for East Lothian, in the Journal of the Royal Agricultural Society, "It is now found that guano, at the rate of two cwt. to the acre, can always be applied with profit to the oat crop, however high the condition the land may be in;" and if this applies to the oat crop (barley is but little grown in Scotland), I imagine it must apply to the barley also. The idea of growing barley after wheat, or two crops of barley consecutively, is not new. In Batchelor's report of Bedfordshire, 1807, he says, "Barley is a favourite crop towards Biggleswade, and is frequently sown after wheat;" and speaking of another part of the county, he says—"The large quantity of London and other manure, which is here used, causes the barley to grow too luxuriantly to make it prudent to venture the clover to be sown, in the first season. The barley is therefore repeated for that purpose, and with better success." But in much more recent times, we find the same course much recommended. In the report for Dorsetshire, published in the Journal of the Royal Agricultural Society, it is mentioned as becoming universal. In Mr. Caird's report, too, of the farming of Lancashire, he is loud in the praise of a Mr. Longton, of Rain Hill, and adds (p. 268):—"Mr. Longton is decidedly of opinion that barley after wheat is the best management with which he is acquainted." With such antecedents, there would be no doubt about the success of the clover crop, and after a luxuriant crop of clover but little of that of the wheat. I have thus endeavoured to sketch out what I believe would be found, upon trial, to be a great improvement on the Norfolk four-course system. I could not have ventured upon recommending such a rotation to your notice, did I not recognize the powerful assistance which agricultural chemistry has brought to our aid; and, although I agree with the remark "that it is a great mistake to suppose that men can be made farmers by teaching them doubtful chemistry," yet I do think that our best thanks are due to those gentlemen who have given up their time to its study; and to those who have kindly initiated us into its principles, and made us familiar with its deductions, something more substantial than empty thanks can be offered without offence. I have not, as yet, alluded to the covenants which should ensure a landlord from the results of an impoverishing and faulty management. To avoid this, much depends on the judicious choice of a tenant; but, to make "assurance doubly sure," I should recommend an agreement, relinquishing into the incoming tenant's hands, one year before the expiration of an agreement not renewed, a proportion of the holding—say one-fifth—and a further covenant that in the last year not more than three-fifths of the entire occupation should be under white straw cropping. I conceive that some such arrangement would unfetter the hands of a tenant very much during the major part of his lease, and could not, by any possibility, result in injury to the landlord. That some such ideas were held in remote days, we may learn from a lease granted by the *demos* or townspeople of Aexone, in the 108th Olympiad; or, 345 years before

the Christian era. The inscription, on stone, was brought with several others from Greece many years ago. It is now in the University of Leyden, and is believed to be of unquestionable authority. Mr. Thomas here read the lease as follows:—"The demos of Aexone let on lease the Philais to Antocles, the son of Anteas, and to Anteas, the son of Antocles, for forty years, for 152 drachmas a-year; the said land to be farmed by them, or planted with trees, as they please; the rent to be paid in the month of Hecatombæon. If they do not pay it, they forfeit their security, and as much of the produce as they stand in arrear. The Aexonians not to sell nor to let the said land to anyone else, until the 40 years have elapsed. In case of a loss on the part of the tenants by hostile invasion, no rent to be paid, but the produce of the land to be divided between the Aexonians and the tenants. The tenants are to deliver up half the land fallow, and all the trees upon the land: for the last five years the Aexonians may appoint a vine dresser. The lease to begin, with respect to the corn land, with Eubulus the Archon entering into office; but with respect to the wood, not before Eubulus goes out of office. The lease to be cut upon stone to be set up by the magistrates, one copy in the temple of Hebe, the other in the Lesche; the boundary stones to be set up upon the land, not less than two tripods on each side. And if a tax should be paid for the land to government, the said tax to be paid by the Aexonians, or if paid by the tenants, to be deducted from the rent. No soil to be carried away by digging of the ground, except from one part of the land to another. If any person makes a motion in contravention of this contract, or puts it to the vote, he shall be answerable to the tenants for the damage." Mr. Caird here most properly remarks, that "in this short lease there is much of that plain common sense, which fairly recognises the duties and interests of both parties, and which is so often lost sight of, in the perplexing labyrinth of modern legal phraseology." Let us contrast these plain but efficient agreements with those impracticable and absurd covenants in the agreements which are forced upon the tenantry of the Duke of Northumberland, and which, although they have been much commented upon, have as yet scarcely been sufficiently canvassed by the farmers of Great Britain. I will read to you a few of the clauses, in order to give you an idea of the nature of these extraordinary documents:—

"3. The further rent of 5*l.* an acre for every acre of the arable land when in fallow, that shall not be manured with at least 20 tons of well-rotted dung or manure to an acre on that part intended for turnips, and 12 tons of manure, or 8 fethers of clof lime to an acre on that part which is made a bare fallow.

"4. The further rent of 5*l.* an acre for every acre of arable land on which more than two crops of corn shall be taken to one following, and which shall not be cultivated in the four-course system of husbandry, by a regular rotation of crops according to good management and the custom of the country, but a deviation from this system may be made on the tenants receiving a license in writing, from the landlord or his agent.

"5. The further rent of 10*l.* for every acre exceeding the quantity of \_\_\_\_\_ acres, which shall in any one year be planted with potatoes, to be manured with at least 12 tons of manure to an acre, over and above what is before men-

tioned to be laid upon the fallow land, and no hemp, rape, turnip, or flax, to be suffered to stand as a seed crop.

"8. The further rent of 5*l.* an acre for every acre of old grass land, which shall be mown without having been dressed the previous autumn with not less than 12 tons of good dung.

"15. No greater stock of sheep, horses, or cattle to be kept upon the premises in the last year than has usually been kept thereon.

"23. The tenant shall accept, immediately preceding harvest time, his predecessor's away-going crop of corn, at a price to be fixed as follows, viz.: The away-going tenant and the entering tenant shall each appoint an arbitrator, and in case of their not agreeing, then the landlord's agent, or whom he may appoint, shall act as umpire, and his decision to be final; but in case either the away-going or entering tenant shall fail to appoint an arbitrator within three days after notice from the landlord or his agent, then the landlord or his agent shall appoint for such tenant an arbitrator, who shall have power to act precisely as if he had been appointed by the tenant so failing. The tenant, just previous to the harvest succeeding the expiration of his term, shall offer to his successor his away-going crop in the mode and on the conditions above specified. The tenant so accepting the crop shall be prepared to pay the amount, or to offer security to the satisfaction of the arbitrators or umpire for the payment of the sum awarded for said crops.

"24. Whatever sum of money shall be awarded to the outgoing tenant for away-going crops, shall be paid to the landlord or his agent, who shall apply the same to the liquidation of any arrears of rent, contingent rents, or for any dilapidations or reparations required by building, water-courses, fences, and premises, and pay the surplus (if any) to the outgoing tenant.

"27. Provided always, and it is hereby agreed that, upon six months' previous notice being given in writing by either party to the other, before the expiration of any one year after the first year, the tenant is to quit the possession of the premises at \_\_\_\_\_ then next following after such notice given as aforesaid."

[The reading of these precious articles of agreement was interrupted by frequent cries of "Oh!" and followed by loud and general laughter].

Now, sir, I feel confident that no document, containing at one and the same time so much coxcombical ignorance and overbearing tyranny, was ever presented to the public since Cadmus first gave letters to Europe. Sir, I hope that I have already said enough to call your attention, and that of the meeting, to the important subject which I have thus introduced, and although it would be easy to amplify upon so fertile a subject, I will add but little more, because I am much more anxious to hear the opinions of others, than to extend my own remarks. I cannot, however, sit down without quoting a passage I lately met with, by an author in great repute among those who style themselves friends of progress—and I hope that we all here actually are animated with that very sentiment—I mean Mr. Caird, who says, "In truth, each year's experience is adding to our knowledge, and extending the means at our disposal for improving the culture of the soil; and the landlord who continues to bind his tenant down to a prescribed routine, from which he must not, under a penalty, deviate, inflicts upon him a very serious injury, without any corresponding advantage." Mr. Thomas resumed his seat amidst much applause.

Mr. J. PAINE (of Felmersham, Bedfordshire) was sure that the club must feel greatly indebted to Mr. Thomas for his very able and interesting paper, and that the suggestion it contained would receive their most serious attention and consideration. He (Mr. Paine) was one who had long recognised the difficulty of getting his turnips every fourth year; and the subject con-

nected with his name, which Mr. Thomas had mentioned, came under his notice about two years ago. It happened that on a thirty-acre piece, well cultivated for turnips, and with a good plant, the greater part of the field became blighted during the summer; the only exception being about seven acres, which had borne a crop of peas during the routine of the previous four years, and which was consequently eight years from the swede crops, and about an acre and a-half of which had been well limed. Here the produce was very good; but these portions were all that was worth a farthing, though the entire field had been sown with the same seed, under precisely similar circumstances. When the process of hoeing was performed, a more luxuriant crop could not be seen; yet within six weeks from that time, saving the two portions referred to, the roots were not worth picking up. What was the conclusion to which he naturally came? Why, that the fault lay in sowing the turnips too frequently (Hear, hear). For his own part he was inclined to think that, through the agency of artificial manures, the farmer might in some districts cultivate his land even upon a six course (Hear, hear). There was one ingredient in the question, however, which should never be lost sight of. Mr. Thomas had alluded to the Duke of Northumberland's agreements. Now, if they had none but such men as the Duke of Bedford to deal with as landlords, there would be little need of requiring what was called fixity of tenure. The farmer would feel himself tolerably safe and quiet without it. But, unfortunately, that was not the case, and there would, he presumed, be always some black sheep in the flock (Hear, and laughter). Before, then, a tenant invested his capital in artificial manures and the improvement of the soil, he ought, in justice, to have a guarantee that he would be enabled to reap the benefit of his outlay (cheers). Land was not all fitted for turnips; but where it was so, he thought that if they commenced one course of four or five years with mangel wurzel, and the next course with turnips, they would not experience much difficulty in getting a good turnip crop. Moreover, upon strong lands they would never do better than raise a crop of wheat, but they could not get two crops of wheat in five years without incurring the cost of two or three cwt. of guano per acre in one of those years. The absence of the security to which he had alluded was the only obstacle in the way of the improvements recommended by Mr. Thomas, though this might be easily remedied by the establishment of a good understanding between landlord and tenant. Let it not be supposed that they were aiming to benefit themselves at the expense of the landlords of the kingdom. On the contrary, they had no wish to extend their cropping without at the same time extending their improvements in cultivation; but to do this they must have security of tenure (Hear, hear). Were the English turnip introduced in one course, and the swede in another, he believed it would also be found greatly to aid the growth and fertility of the latter. Certainly a plan similar to that which he had adopted with clover was attended with much advantage. That plan was to sow mixed clovers (white clover grasses and so on—not broad clover) in one course, and then broad clover in the following course. If the seeds of turnips were "coursed" in the same way, he saw no reason why equal benefit should not arise from pursuing that system (Hear, hear).

Mr. R. BAKER (of Writtle, Essex) was satisfied that Mr. Thomas's excellent paper would be attended with beneficial results. The true principle in the rotation of crops appeared to him (Mr. Baker) to be, not to bring in rotation in successive years such crops as drew from the land the same description of support, but rather that one crop should so alternate with another as to supply

its successor with food, or at all events not to be injurious to it. On lands well managed the following would admit of a green crop of rye or tares, or other vegetable, to conclude with turnips. On his light land he always took rye before turnips, then turnips, barley, and clover. The turnips furnished abundant food for the barley, and the barley was a good preparation for the clover. To the clover succeeded wheat; then he followed with an autumnal fallow, manured slightly, and took barley again. But of course the rotation must vary according as the description of soil varied or changed; therefore the farmer should have the privilege of selecting that mode of rotation which was best adapted to the soil. Upon his light land, also, and many gentlemen present had seen the experiment, he had adopted the system of taking oats after turnips and wheat after oats, and he found that he could grow better wheat in this order than by any other process he had ever tried. In fact, the crop was a most productive one, his last yielding, upon being thrashed out, five quarters an acre; and whenever he could get that quantity he was fully satisfied (Hear, and laughter). The time had now arrived when the old idea about the exhaustion of the soil ought to be entirely abandoned (Hear, hear). There was no such thing as exhaustion of the soil. Only give him an opportunity of clearing the crops as they came in rotation, and an ample supply of manure of an organic character, and he could go on producing crops year by year for ever; in other words carry out what had been ironically termed the "everlasting shift" (laughter). But, unfortunately, leases were too restrictive on the tenants, and tied them down too stringently to a particular system of cultivation, whilst it was difficult to induce the landlord to alter that system even in the present day. In the cases, however, of some farms which he had let since Michaelmas, he had been able to introduce a clause to the effect that two white straw crops should not be taken in succession, unless the tenant first manured the land upon which such crop was so intended to be taken with guano or other manure of like nature, not the production of the farm, of the value of 30s. per acre at the least. So long as the tenant did that—so long as he put into the land that which was necessary to support the crop he took out, if he took it in rotation, he would do injury neither to the landlord nor himself. Indeed, whenever a second straw crop was introduced in that way, by artificial manure, all the straw being returned to the land, the tenant might go on producing and reproducing to the advantage of both. The circumstances of the times demanded that the farming capabilities of the country should be developed. We had a limited area upon which to maintain a rapidly-increasing population; and if the support of the people was to be derived from the soil of the country, there must be more liberal covenants in leases to enable occupiers to raise the largest amount of produce. It was advisable that the "customs" of the country relative to the letting of land should also be changed, for some of them were most obnoxious. Thus, where there happened to be no lease, and the tenancy was from year to year, the landlord could remove his tenant on the 25th of March by giving him a six months' notice, after he had incurred a large expenditure for producing crops, and the tenant was unable, by the laws of the land, to recover one farthing upon a valuation. Another pernicious custom was, that where there was not a sufficiency of farm buildings, and the tenant was obliged to erect them, he must leave them all at the expiration of his term for the use of his successor, and in a perfect state of repair. Instead of such bad customs as these, surely it was preferable at once to have a well-defined agreement (Hear,

hear). We were now in a transition state, progressing to a far better system of cultivation than had ever been known before, and when the minds of the public should be brought to bear upon the question, and the tenants pointed out to the landlords what they conceived to be best for the interests of both, he doubted not that the latter would be ready to accede to their wishes with respect to that which was clearly for the benefit of the nation at large (Hear, hear).

Mr. OWEN WALLIS (Overstone, Northampton) quite concurred in Mr. Thomas's proposition, with regard to the description of land he farmed—namely, the sandy soils—inasmuch as it would give greater opportunities for clearing or eradicating any couch grass that might present itself in the wheat crop before the barley was required to be sown. Besides which, they would get more barley than if they sowed after turnips. With liberal dressing for the turnip crop, and liberal feeding for the sheep upon the turnips, a barley crop was so heavy as to destroy the seeds, or so to weaken them as to render them of little worth for the first year. In Northamptonshire and some other districts there were other descriptions of soil not so liable to run into couch; for instance, the limestone and ironstone soils, and there the six-course system had been adopted with very great advantage. The rotation of that course was—first turnips, then barley, two years seeds, wheat, and then barley again. And, as far as his experience went, he was satisfied that more stock was kept and more corn grown, at a less cost, upon that system than upon any other.

Mr. W. BENNETT (of Cambridge) in rising to address the numerous and respectable agriculturists he saw before him, on the important subject of the evening's discussion, did so not without considerable trepidation. He felt equally obliged to Mr. Thomas, with gentlemen who had spoken, for his able and excellent address; indeed, all who knew that gentleman felt quite assured that in his hands the subject would be treated with ability (cheers). He (Mr. Bennett) went also a long way with Mr. Thomas in acknowledging the desirability of removing the restrictions which in many cases fettered good farmers in developing the resources of the land—and he doubted not on much good land of the country an extra white straw crop might be produced under cleanly farming, and an outlay for artificial manure, to the benefit of the farmer and without injury to the land (cheers). At the same time he felt bound to say that it would be useless for that Club to argue this point unless they could take pretty largely the landowners with them in the views they entertained. For it must be admitted there were, as in all other cases, two sides to this question—before they could change very largely the system of farming from four to the five course, they who let the land would require some security that such privilege should not be abused (cheers). With spirited and good farmers (and more especially where land was unkind for turnips)—he repeated under good cultivation it would be a great improvement. The five or even the six course system might be followed to advantage by a judicious arrangement of crops, and a liberal applianee of manure. But it must ever be borne in mind that a bad instead of a good farmer, with such latitude given him, might beggar the land, and that laws are not made for the good, but for the disobedient. In self-defence, therefore, rather than to cramp the efforts of enterprising good farmers, somewhat stringent covenants were introduced into leases and agreements for land—and sometimes (he would admit) very vexatious and frivolous ones (cheers). It would be idle, however, not to admit that this subject was surrounded with difficulty. The great desideratum was how to give full scope to an enterprising go-ahead

farmer, who would keep his land clean, and in these days of artificial manure keep it up to the mark—and the careless sloven, on the other hand, who would only abuse any extent of privilege of this sort. The time allotted for this discussion would not allow him to go at all at large into this matter, although, with all due deference to the chair, he thought it of far more importance than the examination of fat stock at the Cattle Show that evening (cheers and laughter). Perhaps the granting of a lease with general covenants to keep the farm in good heart and plight, without restrictions as to cropping (except for the last four years, when, to save any retrograde movement in farming on the one hand, or claim for unexhausted improvements on the other, the lease should be renewed) would best obviate the difficulty (cheers). His friend, Mr. Thomas, must excuse him, however, if he said that he thought he had rather overdraw the case in pointing out the evils of the four-course system. That gentleman said "to feed on the land the whole turnip crop, and often with corn or cake, only threw down the barley, damaged the quality, and often spoiled the young seeds," which was all very true; but he (Mr. Bennett) very much questioned the policy of such a course. On good well-farmed land he thought at least one-third of the turnips should be consumed in making the manure at the farm home-stall (cheers). Mr. Thomas further stated that the too frequent repetition of Swedish turnips caused their failure, which was another serious evil. He (Mr. Bennett), however, thought that might be largely obviated by the substitution of mangold, the common turnip, or even kohl rabi, alternately. He had found it answer himself, more especially in transplanting the kohl rabi on a portion of his fallows. The difficulty of getting seeds so often as once in four years had also (and very properly) been pointed out. That evil, by all judicious farmers, was avoided as far as possible by the substitution of the different varieties of clover alternately with peas or beans on a portion of the clover season; and the landlord who debarred his tenant against the latter acted most injudiciously. While, therefore, they were seeking some amelioration in farm covenants, and he thought properly so, the purposes for which the four-course system was adopted, and the astonishing advancement of agriculture within the last fifty years, must never be lost sight of (cheers).

Mr. J. C. NESBIT (of Kennington) looked upon the four-course system of cropping merely as the germ of a more liberal and extended system. The four-course shift was first, turnips; then barley; next clover; and, lastly, wheat. His own opinion was, without reference to the mineral theory of Liebig and others, that the chief use of the intermediate vegetable crops—the turnip and clover—was to collect a certain quantity of organic matter from the air for the production of the other (the paying) crops. The four-course, then, might be expanded to a six, an eight, or even a twelve-course, and that in fact without deviating from the principle. Supposing, by way of illustration, he wanted to convert the four-course into a six-course, the crops could be taken thus—turnips, barley, clover, wheat, mangel or beet, and wheat or barley again. He agreed with Mr. Thomas that in many districts it was best to take barley after wheat, because the wheat having had the first demand upon the accumulated organic matter in the soil, a far better malting barley was produced afterwards. Any lease or agreement which prevented the free action of the farmer in changing the crops was most detrimental to the general agriculture of the kingdom, and the sooner it was put an end to the better. He really did not think the landlords themselves knew much about the forms of agreements. These rested too much with their friends the lawyers, who were generally

content to take as a model something which might have done duty since the early days referred to by Mr. Thomas.

Mr. GRANGER (of Stretcham, Ely) was of opinion that the rotation of crops suggested by Mr. Thomas on barley land was the best that could possibly be adopted; but there must be good farming, and the land should be manured at least three times in the five years. In his (Mr. Granger's) neighbourhood the five-course system was universally practised, but there the land was not barley land. The rotation was roots, oats, wheat, seeds, and wheat, and wherever that course was adopted the land was certainly in the best condition, and made beneficial both to the occupier and landlord (Hear, hear).

Lord BERNERS (of Keythorpe, Leicester), though agreeing with the observations of Mr. Bennett and Mr. Paine, in many respects, would not, as a practical agriculturist, dare venture to lay down a stringent rule for any positive rotation of crops. At the same time his opinion was, that the four-course system was the best in principle, inasmuch as it commenced with a root crop, and the more roots they grew the more stock they kept, and the more corn would eventually be produced. But whilst he regarded the four-course system as an excellent basis, he thought it should be varied as much as possible, in order to keep the land in proper condition. In the remark that a well-considered agreement was best for both farmer and landlord, he perfectly agreed. He would add that there should be mutual confidence between the two, for unless they could say that their interests were reciprocal, they could neither of them hope to succeed.

Mr. PILE (of Tupton, Hants) concurred with Lord Berners that if a basis were necessary, the four-course was the best; but he did not himself believe that it was desirable for the farmer to be bound down to any particular system; on the contrary, it would be to the benefit of all parties that the farmer should have the freest scope for the exercise of his capital, skill, and industry, at the same time that the landlord was ensured against injury at the expiration of the tenancy, and the delivering up of the farm. His own impression, so far as the land of Hampshire was concerned, was that if the tenant kept one sheep to an acre he could not injure his landlord, let him farm the land how he might. In the part of that county where he (Mr. Pile) resided, the four-course system was generally followed; but a friend of his who occupied and farmed his own land had told him that it would ruin any man in England to be bound down irrevocably to that system (Hear, hear). The plan adopted by his friend was simple, being merely to sow half his barley crop after wheat, and half after turnips or swedes. Now the best malting barley grew after wheat; and if he were bound to the four-course system, he could not do this. His experience taught him that where confidence prevailed between landlord and tenant there was no need of any covenants at all, and he hoped the day was at hand when the two classes would better understand their respective interests, and the landlord agree in the justice of paying the tenant for unexhausted improvements at the end of his term (Hear, hear).

Mr. SMITHIES (of Marlow, Leintwardine) said his experience, like that of many others, led him to the conclusion that the four-course system might be very much improved upon, not by merely varying it, however, but rather by doing away with it altogether, and adopting another course instead. Mr. Bennett seemed to think that the landlords might be afraid of introducing any other system; and also that with good farming the four-course might be greatly improved. Surely it must be the landlord's object to encourage the tenantry in farming as well as possible, for it was only by

good farming that they could ever hope to grow two white crops in succession; and they all knew that where the farming was good, upon good land, if the farmer fed his sheep off the turnip crop with a liberal amount of cake and so forth, he would get his land in too high condition for the growth of barley; consequently he might have two white crops in succession after turnips—first wheat, and then barley. A system like that, he thought, could not fail to meet the approval of the landlords, if they were once made to understand it. He believed that, generally speaking, landlords knew nothing about leases and covenants, but had a notion in their heads, which it was difficult to remove, that what was termed the four-course shift was the best. Let it be shown them, that if they insisted upon that system they prevented good farming, and it would go far to induce them to give more liberty to their tenants. So far as the rotation of crops was concerned, he (Mr. Smithies) had derived much more advantage from sowing white clover in one course, and red clover or rye grass in the following course, than from sowing white clover every fourth year.

Mr. WALTON (of Godsfeld, Hants) was inclined to think that the four-course system was a first-rate one. In Hampshire, where he had resided for twenty years, the five-course prevailed, which included two years' seeds, and that did great injury to the land, and filled it with rubbish. His great object and desire had always been, therefore, to induce his landlord to permit the adoption of the four-course system.

After a few words from Mr. NOCKOLDS (of Stansted, Essex), as to the custom of country,

The CHAIRMAN said, he quite concurred in the propriety of not binding down the tenant too stringently to any particular system. Not having land of the description to grow barley to the extent spoken of this evening, the course he adopted was to sow with wheat not oftener than every other year; and as long as prices ranged as high as they had done for the last few years, and he manured accordingly, he considered that he was not acting unfairly by the land; and that he avoided taking a crop of clover more often than once in twelve years, and keeping within these bounds he thought he farmed in a proper manner.

Mr. THOMAS having made a few observations of a general nature in reply.

Mr. OWEN WALLIS proposed the following resolution—  
“Resolved,—That it is the opinion of this meeting that the landlord who binds his tenantry down to a prescribed routine, from which they must not, under a penalty, deviate, inflicts both upon them and the public a very serious injury, without conferring any corresponding advantage.”

Mr. SMITHIES seconded the motion, which was put and carried unanimously.

The proceedings closed with a vote of thanks to Mr. Thomas for his paper, and to Mr. Wood for his conduct in the chair.

## THE ANNUAL DINNER

took place on the Tuesday, in the large room at Radley's Hotel, nearly opposite the Club House. Mr. James Wood, of Ockley, Sussex, concluded his duties as Chairman for the year by presiding on this occasion. He was supported by upwards of eighty members of the Club and their friends. Amongst others were Messrs. R. Baker, C. Stokes, W. Bennett, Jonas Webb, B. P. Shearer, H. Trethewy, James Thomas, T. Owen, T. W. Granger, C. W. Johnson, C. Howard, W. Spearing, S. Druce, J. Druce, T. Twitchell, W. Bullock Webster, R. de

Trehouais, G. P. Tuxford, Greenhow Relph, J. C. Nesbit, the Rev. C. T. James, H. Cheffins, E. Smithies, J. Parsons, J. Marshall, W. P. M. Ouseley, Ibbot Mason, F. Withes, C. M. Bidwell, John Thomas, J. G. King, J. F. Baines, E. Purser, J. A. Nockolds, J. A. Williams, J. Girdwood, J. Cressingham, G. Wilsher, G. Hilton, &c., &c. Mr. Owen Wallis, of Overstone, Northampton, occupied the Vice-chair, as Chairman-elect for the ensuing year.

After the customary loyal toasts had been duly given and responded to,

The CHAIRMAN proceeded to propose "Success to the Farmers' Club." This was, he need scarcely remark, the chief toast on his list. Among the three great sister agricultural societies, the Farmers' Club was not, in his judgment, the least interesting; and he thought that if it continued to progress as it had done of late, its importance would be recognised by all who were in any way connected with agriculture. He entertained very great hopes that the club would take a high position among the leading agricultural societies of the kingdom; and he saw no reason why it should not overtake the Smithfield Club, or even the Royal Agricultural Society (cheers). Indeed, looking to the extent and importance of the class to which its members belonged, he must say it appeared to him rather astounding that it had not gone ahead faster than it had done. Were all the farmers of England of his own way of thinking on that subject, this club would soon become one of the most powerful associations in the kingdom. If farmers generally, instead of always remaining at home and preserving their own actions with jealousy, would come to London occasionally to meet members of their own fraternity, and get their old musty ideas well ventilated (laughter), he ventured to say they would not lose anything by such contact and intercourse (Hear, hear). Were they even to come to town seven or eight times a year, they would in the end sustain no loss, he believed, in a pecuniary point of view (Hear, hear). However satisfied many might feel that they knew better than any one else—and he believed that that kind of feeling prevailed to a very great extent among farmers—he for one was confident that there was no farmer who might not learn something from persons who belonged to the same class as himself. If there were a great number of persons living a great distance apart, each of whom was in possession of a certain amount of agricultural knowledge, what could be more likely to make such knowledge of general utility than for those who possessed it to meet occasionally for discussion and interchange of ideas? (Hear, hear.) Such was, in fact, the object of this club. The Farmers' Club was established to fill up a vacuum which was left by two other societies. In the Royal Agricultural Society they saw breeding stock and implements; in the Smithfield Club they saw fat stock and implements; in this club they met to discuss the merits of all, and to arrive at sound conclusions with regard to the best mode of cultivation and production. In this association, moreover, they became acquainted with each other; and viewing it as a whole, he thought it was the best complement to the other two that could possibly exist. There was, indeed, one obstacle to its advancement. This society stood upon its own bottom; it had no patronage or extraneous aid to push it forward: but though, in consequence of this, its progress might be rather slow, it was also sure—and it was, in fact, advancing as certainly as any society in the country. He repeated his conviction, that in a few years the Farmers' Club of England and Wales would be universally admitted to be one of the most important societies in the land; and with this impression with

regard to its future prosperity, he begged now to propose "Success to the Farmers' Club."

The toast was drunk with three times three.

Mr. R. BAKER (of Writtle) had been requested to return thanks for the toast which had just been given, and he assured them that, as one of the oldest members and one of the founders of the club (Hear, hear), he felt very great pleasure in complying with that request (cheers). Their excellent Chairman, whose zeal on behalf of the club carried him to the utmost extent in advocating its claims to support, had proposed the toast in a manner which made it difficult for him to reply in adequate terms. This, however, he would say, that whether as regarded its object, or whether as regarded the probability of its extension, he thought it hardly possible to say too much. What position it was to occupy in relation to kindred societies time alone would show; but, as representing especially the practical department of agriculture, it always had been, and he believed it always would be, the first society in this country; and if the first in this country, it was in fact the first society of this kind in the world (cheers). It had been said by those who were not perhaps so congenial with practical men as they might be, who set up a theory against their practice, and did not appear to recognize the fact that theory and practice ought as far as possible to be blended together—it was said by such persons in the present day, when the most rapid strides had been made in agriculture, and when science had been brought to bear upon its development, that agriculture was, after all, yet in its infancy. If this were true, he must say it was not a very precocious child (laughter). History informed them that as far back as 4,000 years ago corn was grown very extensively in Egypt, not merely for consumption within the country, but also for the supply of other parts of the world; and if, therefore, agriculture, with all its recent improvements, had not yet left off its swaddling clothes, there seemed little probability that it would ever do so (cheers). But, putting all metaphor aside, he came at once to the grand object of the formation of this club, namely, the combining the best practical men engaged in agriculture in one society, and the bringing a number of them together periodically, for the purpose of discussing subjects of the greatest interest to them as farmers; and he must say that if that course of proceeding did not tend to advance agriculture, he was at a loss to conceive in what way it could be advanced (Hear, hear). It had always been held that when men of any class combined together for some common purpose, they were more likely to effect their object than if they acted only individually. If more of those farmers who lived at a distance were members of the club, they might inspire others with new notions; they might hear something which they had not heard before; they might return home less self-sufficient than they were previously; and a society, which by bringing men together, helped to disabuse their minds of false ideas, to place them on a proper footing of intercourse with members of their body, and to diffuse general information in reference to farming operations, could not do otherwise than conduce to the general advancement of agriculture. He need not take up any more of their time, but would conclude by expressing a hope that the club would always merit the approbation of the community at large; that it would go hand in hand with the Royal Agricultural Society and the Smithfield Club; and that, like them, it would derive and enjoy the respect of other nations besides our own for its services to the cause of practical agriculture (cheers).

Mr. OWEN WALLIS (of Overstone) proposed "The Royal



Agricultural Societies of England, Scotland, and Ireland." After observing that it was the beneficial working of the Highland Society of Scotland which no doubt first suggested to Lord Spencer and others the formation of the Royal Agricultural Society of England, he said that, as one of the judges in the Implemen Department of the latter Society, he had had better opportunities than most persons of watching the progress which the Society had made, and of appreciating the service which it had rendered to agriculture. By the attention which it had paid to the breeding and rearing of stock, in connection with its shows, the Royal Agricultural Society had created a great demand for English breeding stock in France and other continental countries; and it was only on Saturday last that he was told by a horse-dealer that he was at that time commissioned to buy 150 entire horses for exportation to France. But, whatever good the institution in question might have done in relation to stock, it was, he believed, for the good it had effected in regard to the implements and machinery used in farming operations that the farmers of this country were chiefly indebted to it (Hear, hear). It must be recollected that the machinery employed by farmers had been wonderfully improved of late years. At the time of the formation of the Royal Agricultural Society, anything like a steam-engine had never been seen upon a farm; and the excellent portable thrashing machines which were now in such common use were then almost as little dreamt of as steam ploughing (Hear, hear). Steam was already extensively used in the farm-yard and the homestead, and he believed that at no distant period it would prove a most important auxiliary in the cultivation of the soil (Hear, hear). Those who witnessed the performance of the steam-plough at Chelmsford must, he thought, be convinced that its ultimate success was not far distant. Every successive year tended to render the assistance of steam in the harvest-field a more indispensable necessity; and he hoped that in a very short time reaping machines would be generally found to render very great aid in gathering crops.

Mr. SMITHS (of Marlow, Leintwardine), in acknowledging the toast, said that he had attended every meeting of the Royal Agricultural Society of England since its first formation, and that he could consequently speak of the great good it had accomplished. He concurred with Mr. Wallis that great improvements in agriculture were due to the Society, both as regarded stock and implements. One great source of improvement was the assembling of farmers together for purposes in which they had a common interest. He fully agreed with the worthy Chairman as to the advantages of frequent intercourse between practical farmers. It was often the case that a farmer was placed in the midst of a number of men who were not his equals in intelligence or scientific knowledge; and in such instances, however great might be the desire to advance with the times, the tendency of surrounding influences was to make the mind rusty (Hear, hear). If, however, farmers met together in that club, every one found some one who was equally intelligent and equally desirous of improvement with himself, and the effect of intercourse was very beneficial to them all. As regarded the Royal Agricultural Society, let it be recollected that those who subscribed to it, if they could not attend its meetings, would at all events receive a copy of the society's Journal; and the perusal of the admirable papers contained in that publication would be far more than an equivalent for the small sum which they paid (Hear, hear).

Mr. STOKES (of Kingston, Kegworth) had a most pleasing duty to perform, and one in the discharge of which he

felt certain he would meet with the support of all present; it was that of proposing the health of the Chairman (loud cheers). The discussions which had taken place recently at the Central Farmers' Club had been most interesting and instructive, and of great benefit to the country at large. They could not have been carried on properly without an efficient chairman; and their present chairman, who was also the chairman of the club for the past year, so presided over the meetings as to command the respect and esteem of all who attended them. No one who knew Mr. Wood could be insensible to the fact that he had the kindest heart and the best intentions; and he trusted that he would long live to set an example of good farming and of zeal in the advancement of agriculture.

The toast was most cordially received.

The CHAIRMAN, in reply, after expressing his deep sense of the kindness which had just been manifested towards him, said he felt that many men in the club were better adapted for the duty of presiding than he himself was; and that the selection of himself was owing to the necessity of choosing those who would devote time to the work, and of affording an opportunity to the willing as well as the talented. It was on that account that he had consented to fill the office; and he assured them that he had felt it a very high honour to be the president of a society which was composed of four hundred as intelligent men probably as could be found in the country—a body of gentlemen who comprised many of the foremost members of the class to which he belonged. He should always look back with great gratification to that period of his life. In his retirement in the Weald of Sussex, he should consider that a great compliment was paid to him when he was elected chairman of that institution; and he earnestly hoped that the club would increasingly prosper (cheers).

Mr. JONAS WEBB (of Babraham, Cambridge) said a toast had been placed in his hands which he felt great pleasure in rising to bring before their notice; it was "Success to the Agriculture of France." He should have felt more hesitation in proposing that toast had he not seen in the room a very influential French gentleman, whom he should very shortly call upon to respond. He alluded to M. Trehonnais, who was very well known to many present, and he could promise those who had not heard that gentleman speak on an occasion of that kind, a very great treat. M. Trehonnais was known to many persons in this country as an extensive commission agent for the Government of France, and for enterprising private individuals of his nation, who employed him to select the best stock that he could find in this country; and he need not say that if he had not been a man of good standing in his own country, he was not likely to have had so much confidence reposed in him. He therefore felt very great pleasure in asking him to acknowledge the toast. He wished to make one or two more observations before he resumed his seat. Gentlemen who had not the good fortune to attend the Great Paris Exhibition must nevertheless have heard that Englishmen were being well received. For his own part he could testify that he was not only taken in and done for, but done well for (cheers and laughter). He looked upon their French neighbours as companions in arts and companions in arms, and he now called upon them to drink their health as companions in agriculture (cheers).

M. TREHONNAIS (of Falmouth), who, on rising was received with loud cheers, said—This is not the first time, gentlemen, that I have been honoured in the company of English agriculturists with the pleasing duty of acknow-

ledging a graceful compliment paid to the agricultural interest of my country. But I must own that I rise this evening to accomplish this task with much more confidence and pride, nay boldness and assurance, than I felt justified to assume on former occasions. And this for two reasons; first, because you, my friends, and I myself, have formed a somewhat intimate acquaintance (Hear, hear). I am certainly no stranger to you, and some of my friends even go so far as to say that I have ceased to be a foreigner. However this may be, you have taught me to place upon your kindness and goodwill the most implicit reliance (cheers); and from every one of you with whom matters of business or other causes have brought me into contact, I have ever experienced, not only that courtesy which the genuine spirit of hospitality, so characteristic of the English farmer, prompted you to proffer to a stranger, whom a calling kindred to your own brought under your roofs; but what I value infinitely more, the unmistakable tone and demeanour of sincere well-wishers and friends (loud cheers). But, gentlemen, this is a merely personal matter, and with whatever amount of confidence it may inspire me—however proud I may feel from the consciousness of so much interest and goodwill towards me, yet were I to derive inspiration from that cause alone, my address would, I fear, fall short of your expectations, for it would naturally lack that warmth, that glow, that enthusiasm of thought and expression which is only to be derived from the intrinsic merits of a subject such as the one which has been entrusted to my humble powers—a subject possessing an infinitely wider range, bearing as it does on the more weighty questions of political and social economy. I have then another and a far more powerful cause of exultation and confidence, and that is, that French agriculture, to which you have been pleased to pay the compliment of a toast, now possesses some new titles to your esteem and regard—titles which at last rank among those great institutions of the world upon which the mighty spirit of progress has breathed, and in which that life-giving breath has instilled fresh vigour and vitality, raising it, as it were, into an energetic existence out of that musty grave in which ages of ignorance and neglect, exhaustion and collapse, had mournfully laid it (Hear, hear). Yet with all her shortcomings, with all those shackles of routine which still hang about her robust frame and impede the full development of her action, French agriculture exhibits at last symptoms of life and energy which bid fair to effect her complete and speedy emancipation from that tutelage and nursery guidance which the government of France have found it their unavoidable duty to assume, in order to rescue her from that almost hopeless state of decrepitude and degeneracy into which she had gradually sunk under conspiring circumstances ever since the palmy days of Sully and Oliver de Serres (cheers). But, gentlemen, besides the manifestation of this energetic revival, French agriculture possesses another title to your consideration. She is no longer a stranger to your own; other ties than those which bind the pupil to the teacher—the beneficial to the benefactor—may now be said to exist, and to form a connection which, I trust, will ripen into that happy completion when a reciprocity of advantages, a mutual exchange of elements of progress and prosperity, may spring up between them and cement their union (loud cheers). They have met, gentlemen. The English Queen, with her ponderous train of machinery, the peaceful instruments of her creative achievements—with her lowing herds, the flower of her breeds, the pride of her pastures—and attended as a body-guard by an imposing array of her stout yeomen, gathered from all parts of her realm—has crossed that Channel which, narrow though it be,

had heretofore divided two great communities as effectually as if it had possessed the wide expanse of ocean (Hear, hear, and cheers). She did this, gentlemen, in gracious acceptance of a magnificent invitation from her humble sister of France, who, to receive her in a manner worthy of both, had opened to the riches she came to display a gorgeous palace, which the hands of fairies seemed to have vied to adorn (cheers). Gentlemen, something more than a mere exchange of courtesies must and will, I trust, arise from this important event. Although English agriculture may derive no immediate gain from these international exhibitions, yet, as the natural law of everything that is luminous and warm, glorious and beneficial, is to expand and diffuse itself abroad, scattering wherever it can reach beams of joy and plenty, progress, knowledge, freedom, and morality (cheers), so, in the fulfilment of that mission, in obedience to that law, English agriculture, out of the superabundance of her vitality, must necessarily diffuse throughout the world the treasures of her breeds, her implements, and her systems of husbandry, and kindle, wherever these can reach, the living spark of civilization and prosperity (loud cheers). You will allow with me, gentlemen, that if your agriculturists reaped no other advantage but the consciousness that through the skill, industry, perseverance, and indomitable energy of her sons, she has become the spring from which flows agricultural improvement in never-failing streams all over the world, this alone would appear to the eyes of the living generation, as it must undoubtedly appear to those of posterity, a glorious position worthy her ambition, and a goal of sufficient magnitude to enlist for its conquest the mighty efforts of her genius (cheers). And it is even so, gentlemen; go wherever you will, in whatever clime or country, in old or new worlds, in frigid, temperate, or torrid zones, wherever agricultural progress is perceptible, its origin is invariably traced to the introduction of some English elements of improvement, such as breeding stock and implements, the effects of which proclaim at once, in an unmistakable manner, both the effective results of their application, and the glory of the country from which they came. This is a proud position, gentlemen—one which is not only calculated to gratify your feelings as Englishmen, but one which opens to the produce of your skill and industry a boundless and insatiable market, which cannot fail to elevate still higher the already lofty station of your agriculture (continued cheering). As to myself, gentlemen, whose humble name you have so kindly and flattering associated with the diffusion of agricultural progress in France, let me conclude this address with the expression of a sentiment, the realization of which is the greatest ambition of my desires; and that is, that French agriculture may long continue in close alliance with your own, and so profit by this advantageous union as to be enabled at no distant period to reciprocate in a manner worthy of that alliance the priceless advantages she has herself received (cheers).

Mr. W. SPEARING (of Chilbolton, Hants) proposed "The Smithfield Club," and dwelt upon the great benefit which it had rendered to farmers in the impetus which it had given to the improvement of the various breeds of sheep and cattle.

Mr. CHARLES HOWARD (of Biddenham, Beds), in responding to the toast of the "Smithfield Club," thanked the meeting most cordially for their kind notice of that institution; but he felt that the task of responding to the toast was placed in wrong hands, for he would much rather that it should have been responded to by some older member of the club, and one who had received more of its honours; and also by one who had been a successful exhibitor in a class where there was no invidious distinction in the amount of its prizes. In this sense it was his misfortune to be a successful exhibitor in a class of

sheep whose qualifications were not deemed worthy of the same prize as in another class, the object of whose breeders is to keep the tallow market well supplied; but he was almost wicked enough to say, he was happy to find that the privacy of that nice little snug family party, that had so long had the management of the club, had been broken in upon, and no doubt some of the members of that exclusive body had been somewhat scared by the appearance of that intruder the "march of progress" having taken its seat amongst them; for, from the pressure without, it was in contemplation to extend the classes very considerably, and in some cases to give far more liberal prizes. If this were carried out, it must tend much to increase the usefulness of the club (cheers).

The CHAIRMAN then gave the health of the Vice-Chairman, Mr. Owen Wallis, who he was happy to say would succeed himself as Chairman of the Club.

The toast was very cordially received, and duly acknowledged by Mr Wallis.

Mr. CUTHBERT JOHNSON (of Croydon) proposed "The Local Farmers' Clubs," and in doing so alluded to the combined efforts which were being made by the farmers of many districts to collect the chief facts connected with local farming operations, and to the service which was thus being rendered to the cause of agriculture generally.

The Rev. C. T. JAMES (of Ermington, Devon) returned thanks, and in doing so, gave it as his opinion that the one great want of the Central Club was the patronage of the

noblemen and landlords, by which means it would of course gain additional strength and influence.

Mr. GREENHOW RELPH (of Usk) proceeded to give "The Committee of Management." In the course of his observations he combated the opinion advanced by the last speaker, as to the patronage of the nobility being necessary to the success of this Club. He thought rather, on the other hand, that its independence and true character would be much better maintained by its ranks, as at present, being chiefly composed of practical agriculturists.

Mr. SHEARER (of Swanmore, Hants) replied for the Committee, and gave "The Visitors," coupling with the toast the name of Mr. Jonathan Gray, a well-known member of the West of England Society.

The compliment having been suitably acknowledged by Mr Gray,

The CHAIRMAN gave the health of the Secretary, Mr. Corbet, who was very flatteringly received, and who responded with customary brevity.

The CHAIRMAN next proposed "The Press," with which he associated the name of Mr. G. P. Tuxford, of the *Mark Lane Express*, who replied at some length.

Mr. GRANGER (of Stretham) gave "The Ladies," as the concluding toast of the evening, and the company broke up.

It is only justice to Mr. Holt, the proprietor of Radley's Hotel, to say that the dinner was pronounced one of the best ever served.

## THE REGISTRATION OF GOOD LABOURERS.

[The following letter and plan ably explain the object contemplated. With the short trial so far afforded, the idea appears to have worked most successfully, and we have much pleasure in directing the attention of our readers to its consideration].

SIR,—The present unsatisfactory state of the agricultural labouring classes as regards both their moral and social condition, particularly the young and unmarried portion, has for a considerable time awakened the serious attention of every well-thinking mind; and urgently calls forth the necessity of providing some measures of a remedial tendency.

The rapid progress, too, which chemical and mechanical science is making in the cultivation of the soil and its products, the great value of agricultural implements and machinery, the variety of purposes to which steam is now being applied in the operations of the tillage of the land, clearly show, as was observed by Lord Stanley at the North Lancashire Agricultural Meeting, that while "a less demand will be made upon the muscles, a greater demand will be made upon the brains of the labouring class." The dull routine, however, which the agricultural labouring class at present daily pass through, totally unfits them to meet this demand.

The intelligent agriculturist is neither unobservant of these evils, nor unconcerned for their removal; he considers it absolutely necessary that his labourers should be better educated and possess greater skill, if he is successfully to carry out the improvements of the land, in order to meet the exigencies of the times, and the universal and unlimited competition to which he is now exposed. The exertions which the labouring classes are making to improve themselves, also show that their present state is not what it *might* be, what it *ought* to be, and what it is the

interest of all it *should* be. Immediate steps must therefore be taken to remove every hindrance, and every legitimate means used that will promote morality, intelligence, skill, industry, and emulation among them.

The only means that now presents itself for carrying these objects into effect is through the various agricultural and ploughing societies. Hitherto these societies have confined themselves to merely bringing into more prominent notice the *few* individuals who have gained the premiums, leaving *unnoticed* the *many deserving* whom chance or accident, and not the lack of desire to improve themselves, have deprived of success. A lower standard is hereby created, a feeling of jealousy engendered, and a carelessness in the execution of their master's work. To obviate these evils, I have, at the suggestion of some friends, undertaken to bring forward a plan, which I have carried out with marked success in the Tetney Agricultural Society, viz, a Public Registry, not only of the *few* who gain, and that deservedly, the premiums, *but of every individual who actually competes* for a premium, distinguishing the successful from the unsuccessful, and truthfully and faithfully noticing each competitor's service, and the performance of the work.

By a unity of action throughout all the agricultural societies in the county in carrying out this plan, and with the Divine blessing upon the work, not only would a higher standard be created, greater skill, greater emulation promoted; but it being considered a fundamental principle of each society, that a *general good character* must be produced before being allowed to compete, the *moral and social condition* would be elevated, and many others stimulated to enter on and persevere in a course of patient labour, self-improvement, and self-regard.

Annexed is a plan of the proposed registry, stating its

objects and the mode of carrying it out, together with a declaration signed by the secretaries of the agricultural societies in the Lindsey division, and other influential gentlemen and agriculturists, and I trust I may secure your co-operation and support.

In bringing to your notice this plan of a public registry, I am encouraged by the assurance that I possess the approbation and support of many valued friends, and a great number of the most intelligent agriculturists of this large important county, who, feeling the deep responsibility which attaches to them as employers of labour, are desirous of adopting some means as a remedy for, if not the removal of, the great evils so much complained of. I will only further add, in the words of an eloquent writer upon the claims of the labouring classes, that "almost every human being has at one time or other of his life a portion of the happiness of those around him in his power, which might make him tremble if he did but see it in all its fullness. But at any rate, the relation of master and man is a matter of manifest and large importance. It pervades all societies, and affects the growth and security of States in the most remarkable and pregnant manner; it requires the nicest care; gives exercise to the highest moral qualities; has a large part in civil life, a larger part in domestic life; and our conduct in it will surely be no mean portion of the account which we shall have to render in the life that is to come."

I have the honour to be, Sir, your obedient servant,  
*Tetney Vicarage, Great Grimsby.* ANDREW VEITCH.

#### THE OBJECTS OF THE REGISTRY ARE—

By offering through the agricultural and ploughing societies premiums larger in amount, greater in number and variety, and publishing *every competitor*, successful and unsuccessful—

To raise a higher standard of morality and skill among the agricultural labourers and servants.

To become a substitute for the demoralizing statute and hiring market.

To protect the employer from imposture, and the employed from selfishness and caprice.

To be a guide to employers and heads of families in the selection of their servants.

To enable labourers and servants of both sexes upon the register, and none other, to refer to it as a true and faithful certificate of their moral characters as men and women—their honesty, industry, faithfulness—and skill as workmen and servants.

And lastly, by God's blessing, to maintain mutual confidence and good-will between the employer and the employed; to promote the personal comfort and personal interest of both.

The fundamental principle of each society being that no person be allowed to compete for any premium without producing from the employer a certificate of general good character.

#### THE MODE OF CARRYING OUT THE REGISTRY.

That the secretary of each society shall in the end of November, every year, forward to the person appointed to conduct the registry a copy of all the competitors for the premiums, certified by himself, the president, and treasurer of the society.

That all the members and competitors in the different societies shall be presented with a copy, the expense to be

borne in equal proportions by each society, or as shall otherwise be agreed upon.

That the registry should be published by the authority and recommendation of the North Lincolnshire Society.

#### DECLARATION.

We, the undersigned, having considered the plan of a public registry of agricultural labourers and servants, as proposed by the Rev. Andrew Veitch, and carried out by him in the Tetney Agricultural Society, do hereby declare that we desire to promote the success of the said plan, as being beneficial to the master, and just and encouraging to the servant; and are prepared to regard such public register as a testimonial worthy of credit, and a guaranteed certificate of the moral character as well as skill, &c., of all whose names appear on the register.

Signed by—

Charles North, Treasurer to Alford Agr. Society	A. Gedge, Ludborough
John Higgins, jun., Sec. do.	J. Grimoldby, Tetney
George Griffin, Sec. Horn-castle ditto	W. Scorer, Burwell
F. Wilson, Pres. Hainton Agr. Society	G. Cox, Burwell
Robert Cole, Sec. Hainton Society	Luke Borman, Irby
Henry Smyth, Pres. Louth Agr. Society	J. W. Foster, Ludborough
J. Wm. Wilson, Hon. Sec. Louth ditto	J. Winter, Covenham
F.C. Massingberd, S. Ormsby	H. Lloyd, Yarborough
Francis Hes, Barnoldby-le-Beck	J. Parker, Ludborough
Henry A. Pye, Louth.	W. M. Bond, Yarborough
George Allington, Swinhope	Henry Empson, Ravendale
J. W. Smyth, S. Elkington	F. Sowerby, Aylesby
J. Browne, Limber	T. Borman, Swallow
W. M. Pierce, West Ashby	Chr. Coates, Ashby-cum-Fenby
J. Allington, Candlesby	The Bishop of the Diocese
James Robson, Brackenbro.	The Hon. Sir Hy. Dymoke, Bart., Pres. Horn-castle Agr. Society
Wm. Raithby, Grainthorpe	Ayscough Boncherett
Hy. Freshney, S. Somercotes	John Marshall
John Cocking, Fulstow	John Hes
Elymas Hewson, Tetney	Henry Skipworth
W. Seaton, N. Thoresby Brge	T. Kirby
G. Holland, Strubby, Wragby	Rev. H. Philpott
G. R. Willoughby, Louth	T. Randall
T. Lyall, Gayton-le-Wold	W. Torr
W. B. Hewson, Tetney	The North Lincolnshire Agr. Society
	Henry Empson
	M. Wm. Hoy.

**THE SOCIETY OF ARTS.**—In accordance with a By-law, the Council of this Society have appointed several Committees of Reference from the members of their own body, "to whom they may refer for examination, advice, and reports such discoveries, inventions, improvements, and novelties, as shall from time to time be brought under notice." Amongst others they have selected a Committee of Agriculture, which is thus made up—

Thomas Dyke Acland.	Chandos Wren Hoskyns.
Robert Baker.	Rev. Anthony Huxtable.
James Beadel.	John Bennet Lawes, F.R.S.
Sir John P. Boileau, Bart., F.R.S.	John Joseph Mechi.
James Caird.	Philip W. S. Miles.
Colonel Challoner.	John C. Morton.
John Clutton.	Sir Joseph Paxton, M.P.
John Evelyn Denison, M.P.	Lord Portman.
Francis Fuller.	Thomas Scott.
John Girdwood.	Bettesworth Pitt Shearer.
	Prof. John Wilson, F.R.S.

AGRICULTURAL STATISTICS AND IMPORTS OF FOREIGN CORN.

Sir,—The collection of these returns will no doubt be forced upon agriculturists; and the question is how this can be obtained with the least objectionable provisions, and the extent for which they may be desirable for the main objects of the inquiry. The returns of the present year from Ireland and Scotland, made up to the 1st of September, include the acreage of the different crops and the number of cattle in each country. This, in our opinion, contains all that at present is required, and that can be depended upon for any approach to accuracy, elucidating the important question of the increase of different crops and that of cattle. The Irish returns show the increase of the acreage of wheat for the present year to be 20 per cent., and that of Scotland 36 per cent. This increase unquestionably arises from the high remunerating prices of the two past years, and we may fairly suppose there have been similar results in England. But assuming that the general increased growth in the empire has been to the extent of 10 per cent., and the product of the crop of wheat in the years 1854-5 to have been 14,000,000 quarters, such additional growth would be 1,400,000 quarters, if 20 per cent. 2,800,000 quarters, a quantity equal to the whole of our foreign imports during the cereal year of 1854.

It is thus seen that the question of the increase or diminution of the acreage of wheat grown in Great Britain is one of the most important elements of the utility of agricultural statistics, and similar results would be shown by the returns of cattle.

The necessity of compulsory returns is evident, from the hostility of many of the county members; but their objections might probably, in a considerable degree, be overcome by the government only requiring the acreage of land under cultivation, and the number of cattle.

The mode of collecting these returns is the great point in dispute. They should be made as little objectionable to the agriculturist as possible, and no unnecessary minutiae should be required; but a simple return of the acreage in occupation, and the number of cattle, horses, sheep, and swine, of all ages and descriptions, included in each return, without specifying the different classes of animals or their age. To avoid unnecessary trouble and the prolixity of the returns, they should be confined to the occupations of the farmers and holders above ten acres; this would greatly lessen the number of returns that would otherwise be required from the small occupiers, as the publicans, butchers, gardeners, nurserymen, and private individuals.

There is another important item that it would be desirable to obtain, that is the quantity of old wheat left in the hands of the farmer on the 1st of September in each year. This return would not generally be objected to, as most holders are proud of their ability to hold stocks of old wheat, and it would in some degree put an end to the wild estimates that have been occasionally made as to the quantity of old wheat remaining in the farmers' hands at harvest time. In the year 1853, from the low prices that had prevailed during that year, our farmers held back a large quantity, and the amount was estimated by Messrs. Sturge of Birmingham as five million quarters, whilst our estimate was two millions. In that year, in the parish in which we reside, there were 26 holders of 850 quarters; in 1854, from

the high prices of that year, there were only two holders of about 200 quarters, and the probability was that the total quantity in the farmers' hands was only some 500,000 quarters, and we are inclined to think there has been a similar quantity in September for the last two years.

The collection of the returns should be through the medium of the collectors of poor rates, returnable to one or more county inspectors; and thus would be avoided the proposed interference of the Poor Law Board, and the employment of their official machinery.

The question of fines for non-returns should be made as simple as possible. Each defaulter should be summoned before the magistrates of the district by instructions from the county inspector to the collecting officers, and no attempt be made to fill up any non-return by calling in surveyors; the fact of the fines being regularly enforced and the simplicity of the nature of the returns would in a short period overcome the objections of the defaulters.

The returns of the supposed yield of the different crops of grain should not be required generally of the farmer, as 500,000 different opinions could not be reduced to anything like correctness, and many of the occupiers might not give a fair estimate of their crops when the yield was in excess of an average crop. This information would better be obtained by the inspector of the county in the month of November, by requesting two of the most intelligent and respectable occupiers in each hundred of the county to favour him with their opinion of the general products of the year in their immediate districts.

Notwithstanding the dictum of the special commissioner of the *Times*, who, in his estimate of the required imports for the year 1855, after surveying the crops from the South Foreland to John O'Groats, assumed it would be one million quarters of wheat—the actual imports for the cereal year, that is from the 1st of September, 1855, to the 31st of August, 1856, have been 3,949,440 quarters, and this quantity has been barely sufficient to meet the requirements of the country from the deficient crop of that year.

The last four months' importations of foreign corn have been as follows:—

Wheat—July ...	652,194 qrs.	} Other Grain—418,971 qrs.	
"   August, 641,117	"   "		343,414 "
"   Sept.....	564,045		249,233 "
"   Oct.....	474,752		421,307 "
	2,332,108 qrs.	1,433,425 qrs.	

A total of 3,765,533 qrs. May not this enormous import of foreign corn in some degree account for the drain of gold from the Bank of England, as estimating its cost on the average at 40s. per quarter, it would amount to £7,531,066 sterling? S. SANDARS.

*Hemel Hempstead, November 17th, 1856.*

The imports of foreign wheat in 1850 were 4,330,263 qrs. Our average price 40s. 3d. per qr. 1851 " 5,330,412 " " 36s. 6d. " 1852 " 4,164,602 " " 40s. 9d. "

These unremunerating prices to the British agriculturists reduced the cultivation of wheat in Ireland from 678,646 acres in 1849 to 326,896 acres in 1853, a difference of 53 per cent.

Notwithstanding these low prices, the exports from

Odesa were gradually increasing to an enormous extent, as follows:—

1851 .....	300,000 quarters.
1852 .....	1,400,000 quarters.
1853 .....	3,160,507 quarters.

Showing that such prices were highly remunerative to the Russian cultivators, though destructive to the British.

Our impression is that the required imports of foreign wheat for the cereal year will be to the extent of some 1½ to 2 million quarters, a large proportion of which has or will come to hand by the 1st of January—any further import will tend to depress our home market, but to what extent is to be seen. America alone may send us some 3 millions of quarters.

**EGYPT.—THE TRADE OF ALEXANDRIA.**

OFFICIAL REPORT ON THE TRADE OF ALEXANDRIA DURING THE YEAR 1855.

BY MR. CONSUL GREEN.

In my commercial report last year I stated the annual arrivals and departures of British and foreign merchant vessels at Alexandria, from 1843 to 1854 inclusive.

The shipping returns for 1855 show that 673 British vessels, of which the aggregate tonnage was 239,654, arrived here during the year 1855, which, compared with 428 vessels measuring 170,137 tons in 1854, shows an increase of 245 vessels, and 69,517 tons. The arrivals during the four previous years were—

In	Vessels measuring.	Tons.
1850 .....	371 .....	111,128
1851 .....	424 .....	130,533
1852 .....	307 .....	95,154
1853 .....	218 .....	93,050

The departures of British vessels from this port, during the year 1855, were 634 vessels, measuring 198,849 tons, showing, compared with 402 vessels, measuring 163,914 tons, in 1854, an increase of 232 vessels, and 34,935 tons. The departures during the four previous years were—

In	Vessels measuring	Tons.
1850 .....	372 .....	110,207
1851 .....	364 .....	113,793
1852 .....	380 .....	116,951
1853 .....	213 .....	95,022

The great increase of British shipping employed in this trade must be principally attributed to the rapid development of the corn trade of Egypt, and experience alone can decide whether this increase is the result of events connected with the war, or whether it will be permanent.

The value of the imports from Great Britain to this port was, in 1855, £904,289, against £728,437 in 1854; showing an increase of £175,852. The value of imports was—

In	From Great Britain.		From all places.	
	£	.....	£	.....
1850 .....	727,805	.....	1,339,099	.....
1851 .....	863,781	.....	2,164,265	.....
1852 .....	623,713	.....	2,420,805	.....
1853 .....	1,153,326	.....	2,666,690	.....
1854 .....	728,437	.....	1,905,856	.....
1855 .....	904,280	.....	2,141,233	.....

The value of the exports to Great Britain from this port was, in 1855, £2,560,651 against £1,517,744 in 1854; showing an increase of £1,042,907.

In	To Great Britain.		To all places.	
	£	.....	£	.....
1850 .....	1,465,001	.....	3,153,378	.....
1851 .....	1,641,933	.....	3,258,042	.....
1852 .....	1,956,064	.....	3,736,330	.....
1853 .....	1,787,546	.....	3,472,830	.....
1854 .....	1,517,744	.....	3,028,219	.....
1855 .....	2,560,651	.....	4,590,804	.....

The quantity of wheat exported during the last six years has been as follows:—

In	To Great Britain.		To all places.	
	Qrs.	.....	Qrs.	.....
1850 .....	333,206	.....	818,572	.....
1851 .....	669,935	.....	884,286	.....
1852 .....	333,604	.....	540,994	.....
1853 .....	405,120	.....	706,086	.....
1854 .....	368,000	.....	632,309	.....
1855 .....	696,634	.....	1,046,782	.....

The highest price for wheat (free on board) during the year 1855, was 48s. per quarter, on and about the 30th November; the lowest price, free on board, having been 35s. per quarter, on the 5th August.

The quantity of cotton exported during the last six years has been as follows:—

In	To Great Britain.		To all places.	
	Cwt.	.....	Cwt.	.....
1850 .....	243,876	.....	365,817	.....
1851 .....	144,481	.....	254,180	.....
1852 .....	353,830	.....	595,080	.....
1853 .....	203,044	.....	375,535	.....
1854 .....	241,291	.....	430,110	.....
1855 .....	243,553	.....	468,797	.....

The rate of exchange upon London, for bills at three months' date within the year, has fluctuated from p. 97½ per £ (on the 20th October, when it was at its lowest) to p. 99½ per £ (on the 20th of May, on which day it was at the highest rate during the year); the sovereign passing for piastres 101.

The opening of the railway between Alexandria and Cairo has conferred great benefit on all branches of commercial industry in this country, but especially in facilitating the transit of British passengers, mails, merchandise, and specie, through Egypt, to and from India. The railway from Cairo to Suez is also rapidly advancing; a considerable portion of the rails having already arrived, and the entire quantity having been ordered in England. The engineer in charge of this work asserts that he will be ready to open the railway for traffic within a year, but this can hardly be expected.

The total number of passengers that passed through Egypt on their way to India during the year 1855 was 2,458, being an increase of 282 on the previous year. The number of packages of merchandise and specie for India was 45,339, showing an increase of 11,478 on the previous year. The number of passengers homewards were 2,571, showing a decrease of 42 passengers. The number of packages of merchandise and specie from India was 16,827, being a decrease of 22½ on previous year. The value of the specie forwarded to India from Europe by this route during 1855 was about nine millions sterling.

The entrance to the harbour of Alexandria is being marked off by beacons and buoys, under the direction of an officer of the French navy, by means of Mitchell's patent iron screw piles. This undertaking was commenced just as the stormy season set in, so that but little progress has been made with the work, and it will only be during the summer months that this invaluable boon to navigation can be completed.

10th March, 1856.

**TRADE OF SWEDEN—STOCKHOLM.**

EXTRACT FROM OFFICIAL DESPATCH FROM HER MAJESTY'S MINISTER (MR. A. C. MAGENIS) AT STOCKHOLM WITH RESPECT TO THE TRADE OF SWEDEN FOR THE YEAR 1854, AND DATED 26TH FEBRUARY, 1856.

The export of grain from Sweden in 1854 exceeded that in 1853 by an amount of 724,331 barrels; and the whole value of the grain exported in 1854, deducting the value of grain imported during the same year, may be reckoned at about 8,000,000 six-dollars banco, about £666,000 sterling.

As regards the effect of the war upon the trade between Sweden and Finland, as shown by these returns, I may mention that, in 1854, there were imported from Finland 65,364 barrels of tar, 44,698 dispuuds of pitch (the dispuud is 20 lbs.),

and 195,350 lbs. of hemp and sweet oil, none of which articles are to be found among the imports of previous years.

And there was exported to Finland, in 1854, 597,563 lbs. refined sugar, instead of 10,839 lbs. the previous year; 779,215 lbs. of cotton, 1,016,296 lbs. coffee, and 96,939 barrels of salt, none of which articles appear in the exports of former years. During the same year there arrived in Sweden 1,256 Finnish vessels and boats with cargoes, whilst in 1853 there were only 217.

The Custom dues levied upon imports at Haparanda, in 1854, amounted to 77,318 rix-dollars banco, while in 1853 they were only 13,245. At Umea they amounted, in 1854, to 62,141 rix-dollars banco, and in 1853 to only 5,135 rix-dollars banco, and this increase is to be attributed to the blockade of the Finnish ports in the Gulf of Bothnia.

As regards direct trade with Russia, the value of the imports thence in 1854 amounted only to 315,000 rix-dollars banco, or 2,869,000 rix-dollars less than in 1853.

## CALENDAR OF AGRICULTURE.

In fresh weather plough stubbles for green crops and bare fallows, and open all cross cuts to convey the water to the side ditches. If the weather be very favourable, pull and store turnips for a supply during storms; thatch the heaps lightly with straw, or lay the turnips under cover, not exceeding four feet in height. Collect manures of all kinds about the farm-yards.

In frosty weather deliver grain, carry fuel, and do other necessary carting; carry out dung from the cattle yards to the fallow fields; lay the heap in a convenient corner, and make it square and sloping at the ends, that the carts may pass over it; spread thinly and mix evenly the rough and finer materials, and the dung of the different animals, to have the heap of equal quality; when finished, dress the heap neatly, and lay earth upon the edges.

Clean water-courses and scour ditches, and carry the materials to a heap for lime compost. Prepare artificial manures for top-dressings; cut under-wood, hedges, and copses.

Sow common and spring wheats on lands cleared of turnips, and on fallows where stopped in autumn.

Continue the cutting of drains in fresh weather to half the depth, the other half to be taken out when filled. The depth should be a yard, with 18 inches of broken stones, and eighteen inches of turf and earth over them. Tiles are placed with a covering over them of broken stones or gravel. Float water-meadows, and lay dry occasionally.

During this month, live stock of all kinds will require the most earnest and constant attention of the farmer, and that care must be his own. Milch cows must have cleanliness and comfort, regular feeding with steamed chaff, dry hay, steamed roots, cabbages, turnips, and beet; ample littering must be provided. Suckle both veal and weaning calves: no substitute yet found can supply the want of the natural provision in milk. Have the calf-pens opening into the cow-shed by a door, for the convenience of sucklings, each calf in a single apartment of four feet by six or eight, bottom raised and boarded, latticed or bored with auger holes, to carry off the water, and procure a dry bed. Change the litter frequently.

Feeding bullocks in the yards, or tied to stakes, require a regular supply of roots from the store-

pits—in hard weather as much as they can eat, and not to waste, and the cribs cleared out at night. Cribs closely latticed or bored suit best in letting off the water. Litter the yards often and thinly, keep them level, spread over the surface all substances equally, the dung from the stable very especially, and no heating or burning will happen. It is most essential that all animals lie dry.

Arrange the sheep flocks in proper lots of age and quality in the fields, and give keeping ewes a feed of turnips carted to a grass or stubble field; the feeding flock a full allowance, being confined on the ground, or carted to an adjoining field if the land be wet; the last year's lambs a full allowance, easy treatment, and a dry lair: a gorging with food will not compensate the neglect in treatment. Early ewes will begin to drop lamb: a master of his business will have provided good shelter both for day and night in a paddock or small field, with a covered shed standing dry, and an ample supply in juicy food in turnips, beet, and cabbages. One thing in superfluity or abundance is lost without the necessary adjuncts. Attend to the feeding of hogs with ample food of steamed roots mixed with the meals of light grains, and towards finishing give one meal a-day of hard corn—thought wasteful, but is gainful in producing solid bacon. The food of brood sows may be made thinner and more mashy. Feed store pigs with raw and steamed roots occasionally: a dry bed and warmth are essential to the thriving of pigs, and cooked food has been found more useful to them than raw, in a much greater proportion than to other animals.

Feed poultry with light grains, and with steamed potatoes mixed with meals, placed in troughs for them under a shed or cover. Have a hatching-house separate from the roosting-house, and both heated, by pipes below the floor, from fire or hot water.

Bacon hogs and good store pigs will sell well during this month, and the fattening bullocks foremost in condition, when put up in the end of autumn, will come out for the butcher; such articles being often scarce at this early period, a higher price is obtained.

Feed work horses with cut chaff of clover hay and straw, steamed and mixed with potatoes, or both singly. Give a hot meal in the evening, when the horses return from work.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND.		ATMOSPHERE.			WEATH.
1856.	8 a.m.	10 p.m.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Nov. 22	30.26	30.20	46	54	48	W. N. W.	airy	cloudy	cloudy	cloudy	dry
23	30.14	30.01	47	55	51	W. by S.	lively	cloudy	cloudy	cloudy	dry
24	29.83	29.83	47	54	48	N. West	lively	cloudy	cloudy	fine	dry
25	29.95	30.03	37	39	37	N. West	variab.	cloudy	fine	cloudy	dry
26	29.66	29.63	35	39.5	39.5	S. and N. W.	variab.	cloudy	cloudy	cloudy	snw.&rn.
27	29.64	29.68	38	48	36	W. by N.	gentle	fine	fine	fine	dry
28	29.75	29.65	32	38	32	W. by N.	gentle	cloudy	cloudy	cloudy	dry
29	29.65	29.66	25	36	29	N. West	gentle	fine	sun	fine	dry
30	29.69	29.87	23	33	29	N. West	brisk	fine	sun	fine	dry
Dec. 1	29.91	29.90	22	33	29	N. West	gentle	fine	fine	cloudy	snow
2	29.90	29.90	21	33	32	Westerly	gentle	fine	sun	cloudy	dry
3	29.80	29.90	30	36	29	E. by N.	gentle	cloudy	cloudy	fine	rain
4	30.02	29.90	26	38	38	S. Westerly	gentle	cloudy	cloudy	fine	dry
5	29.64	29.46	36	52	52	South	strong	cloudy	cloudy	cloudy	rain
6	29.50	29.50	48	53	55	S. West	strong	cloudy	cloudy	cloudy	rain
7	29.54	29.60	54	57	55	S.S.W.	strong	cloudy	cloudy	fine	dry
8	29.56	29.46	53	55	55	S.S.W.	brisk	cloudy	cloudy	cloudy	rain
9	29.55	29.38	51	57	54	S.S.W.	brisk	cloudy	cloudy	fine	rain
10	29.34	29.38	51	53	52	S.S.W.	lively	cloudy	cloudy	fine	rain
11	29.49	29.38	45	50	46	W. by N.	gentle	fine	fine	cloudy	rain
12	29.32	29.00	45	51	45	Variable	gusty	fine	cloudy	fine	rain
13	29.94	29.10	40	47	43	W. by N.	gentle	cloudy	fine	fine	dry
14	29.42	29.90	39	44	43	North	gentle	cloudy	cloudy	cloudy	dry
15	29.90	30.42	33	30	32	North	gentle	fine	fine	fine	dry
16	30.50	30.50	26	36	31	Variable	calm	fine	sun	fine	dry
17	30.41	30.29	25	40	42	W. by N.	gentle	fine	fine	cloudy	dry
18	29.90	30.06	37	47	45	W. by N.	brisk	cloudy	cloudy	cloudy	rain
19	30.31	30.39	36	43	40	W. by S.	gentle	cloudy	cloudy	cloudy	dry
20	30.41	30.61	38	47	46	West	gentle	cloudy	cloudy	cloudy	dry
21	30.44	30.33	42	45	43	W. S. W.	fresh	cloudy	cloudy	cloudy	dry

ESTIMATED AVERAGES OF DECEMBER.

Barometer.		Thermometer.		
Highest.	Lowest.	High.	Low.	Mean.
30.320	29.120	56	17	39.3

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
45.05	37.75	41.415

WEATHER AND PHENOMENA.

November 22. Changeable.—23 to 25. Remained dry; but on 26, snow first fell, followed by the greatest rain-fall of November, 0.585 in. Frost took up on the 28th, and the weather remained fine and drying. Rain-fall of November, 1.152.

LUNATION.—New moon 27th, 4h. 1m. afternoon.

December 1. Hint of snow.—2. Sunny.—3. Snow and rain.—4 and 5. Rain and storm.—6.

Fierce wind.—7. Gradual clearing; small dark clouds.—8 to 11. Very rainy period; rain, 1 in. 433 cts.—13. Much white cirrus.—14. Two series of clouds.—15 and 16. Cool and bracing.—17. Thaw, after a morning hoar-frost.—18. Overcast.—19. Superb red sunset.—20 and 21. Gloomy day.

LUNATIONS.—First quarter 5th, 3h. 26m. morn. Full moon 11th, 8h. 13m. afternoon. Last quarter 19th, 6h. 44m. morn.

REMARKS CONNECTED WITH AGRICULTURE.

The reader, by attending to the items of this Diary, can scarcely fail to see that the weather of the period has been very singular. The sudden transitions of the temperature, and those of the barometer, from great depressions to unwonted elevations, have been nearly unprecedented of late years. Agriculture, however, is in a fine position, as to the crops in the ground.

JOHN TOWERS.

Croydon, Dec. 22.



## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR DECEMBER.

Notwithstanding that the deliveries of home-grown wheat have been only moderate for the time of year, the demand for that article during the whole of the month has been in a most depressed state, and prices have continued to give way. In the general condition of the samples no improvement has taken place; and a large admixture of dry foreign has been found necessary to make anything approaching good saleable flour. Much has been said of late as to the policy of forwarding wheats for sale in wretched condition, and disposing of them at a considerable sacrifice. A much longer period, it has been argued, should have been suffered to elapse ere the stacks were disturbed, in order to allow a dry atmosphere to have its accustomed influence upon them. Were all our farmers wealthy growers we might well admit the soundness of the argument; and we might express our astonishment that they should feel disposed to sell in the face of drooping markets. But the agricultural body have numerous claims to meet, and are compelled to sell their produce at periods most convenient to themselves. The future state of the trade is forming the subject of much discussion amongst producers as well as consumers; and numerous calculations have been made, chiefly on a false basis, to prove that future supplies from abroad are likely to depress prices to some extent. In reality, however, fine wheats, both English and foreign, have given way but little, and this is a strong proof of the great consuming powers of the country. The stock of foreign grain in the United Kingdom is by no means heavy for the time of year, and an active demand is likely to be experienced for a considerable period both for Spain and Portugal. We maintain, therefore, that good and useful wheats will continue to command a good price, and that the farmers' interests would be best served by moderate thrashings, especially at the present period, when millers contract their liabilities as much as possible.

The produce of the barley crop is turning out well in quantity, but deficient in colour. This article continues high in price, and in extensive demand. That its use is rapidly on the increase must be apparent from the enormous quantities now used in distilleries above any corresponding period; and the new trade which has sprung up on the continent for British-made spirit, caused by the failure of the vintage, demands special consideration, from the effect it is likely to have upon the corn trade. Until within the last two or three years scarcely any English spirit was consumed on the continent, the total export in 1852 being only about 220,000 gallons. This year, however, the shipment has amounted to 4,000,000 gallons, and it is likely to be equally extensive in 1857. The spirit is principally shipped for the purpose of "making up" the low wines of the continent, and it is now much preferred to that formerly received from Holland. The trade is certainly a most profitable one, and this must be obvious when we state that from a quarter of barley—costing, say, 40s. per qr.—from 20 to 21 gallons of proof spirit is distilled, and which is worth 3s. 1d. to 3s. 3d. per gallon free on board. We understand that about 600,000 quarters of grain, chiefly barley, have

been consumed in this way by distillers since the first of January last; hence we cannot feel surprised that the article should have commanded good prices. Oats, beans, and peas have thrashed out well, and quotations have given way under the pressure of foreign supplies.

The weather has been very changeable in most parts of the United Kingdom, and possibly too mild for the young wheats in some localities; they are, however, looking remarkably well. The potato crop is turning out very indifferent as to quality in Scotland, as well as in some parts of England. The markets have for the most part been very moderately supplied, and prices, although the demand has been far from active, have had an upward tendency—good sound qualities having realized 120s. per ton. The imports of foreign potatoes into London in the course of the month have about 600 tons.

Somewhat increased supplies of grain, especially wheat, have been on offer in the French markets, whilst in the northern parts of Europe the receipts have not been extensive. The trade generally has ruled inactive, and the quotations have been in favour of buyers. The fact, however, that our money market has become much easier—a reduction of one per cent. having taken place in the value of discounts—has induced the holders abroad to be rather firm in their demands, as there is now less difficulty in disposing of good corn bills. From the United States large quantities of produce continue to be shipped both to England and the continent, and we learn that the quotations at New York favour a large export trade.

The various cattle markets have been extremely well supplied with beasts for Christmas consumption, and prices have ruled tolerably high.

In Ireland and Scotland the corn trade has been heavy, and quotations almost generally have given way. The shipments of produce to England have been on a very moderate scale.

Hops have been in steady request, and fine qualities have commanded rather more money. The quantity still remaining in the hands of the growers is large. A few parcels have come in from Germany, and which have been offered in bond at from £1 5s. to £1 15s. per cwt.

The wool trade has been extremely healthy, and both English and colonial qualities have sold on rather higher terms. The total imports of foreign and colonial wool this year, to the end of November, were 354,212 bales, against 302,297 bales in the corresponding period of 1855. In the manufacturing districts great activity is observed in the woollen trade, and there is every possibility of even higher quotations.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The principal feature of the month has been the holding of a series of great cattle shows. With very few exceptions they have exhibited unusually fine supplies of beasts, both as to number and quality, and they have passed off remarkably well. But the changes in some of the rules of the Smithfield Club are regarded by not a few of our

leading graziers as of an highly important character, especially those having reference to the new classes for Scots and Sussex beasts. It would be quite superfluous for us to dwell upon the excellencies of those breeds, because they are too well-known to require comment; but the wonder now expressed is that they should not have been regarded in so favourable a light by the supporters of the Club as the Devons, Herefords, or shorthorns. However, a great point has been gained, and we have no hesitation in saying that it will materially add to the attractions of the Show in future years, and greatly enhance the position of Scotch and Sussex breeds in the estimation of the general consumer. As a whole, the exhibition, both in Baker-street and the Great Metropolitan Market, has seldom been equalled; but the aggregate returns to the graziers, though large, have not been in excess of former years. The trade, taken as a whole, has been remarkably steady, and the limited receipts of sheep have had the effect of enhancing the value of mutton fully 4d. per 8lbs. We have now arrived at the close of the bullock season from Lincolnshire, and the adjacent counties. It has certainly failed to produce an amount of meat for metropolitan consumption, which might have been anticipated under the influence of a fine season; still we are of opinion that the stock has turned out heavier, and of more even quality than in 1855. We shall now shortly receive the first droves from Norfolk, and, if our accounts are to be relied upon, an immense number of prime beasts will come to hand during the next six months.

Although there has been a large consumption of cake and linseed, those articles, owing to increased supplies from abroad, have somewhat declined in value. Possibly, the great abundance of natural, or winter, food has had some effect upon the markets. The boisterous state of the weather has prevented the arrival of the usual supplies of stock both from Ireland and the continent; but this feature has had very little influence upon the trade, from the large receipts of home-fed beasts.

The annexed return shows the total supplies exhibited in the metropolitan market:

Beasts.....	23,995 head.
Cows .....	475 "
Sheep .....	73,200 "
Calves.....	1,526 "
Pigs .....	2,330 "

COMPARISON OF SUPPLIES.

Dec.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1855. . . .	22,412	590	94,030	1,376	3,184
1854. . . .	20,298	120	88,880	1,573	2,746
1853. . . .	23,314	484	88,480	1,143	2,403

From the above comparison, it will be seen that an unusually small number of sheep has been shown this month.

Beef has sold at from 3s. 10d. to 5s.; mutton, 4s. to 5s. 6d.; veal, 3s. 8d. to 5s. 6d.; and pork, 3s. 8d. to 5s. 4d. per 8 lbs., to sink the offal.

COMPARATIVE PRICES.

	Dec., 1855.		Dec., 1854.		Dec., 1853.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef, from ...	3 4	to 5 4	3 4	to 5 4	3 2	to 4 10
Mutton ...	3 4	— 5 0	3 6	— 5 4	3 0	— 5 2
Veal.....	3 10	— 6 0	4 0	— 5 8	3 1	— 5 0
Pork .....	3 6	— 5 0	3 2	— 4 8	3 4	— 4 10

The annexed returns show the imports of foreign stock into the metropolis:—

Beasts.....	2,496 head.
Sheep .....	7,778 "
Calves.....	793 "
Pigs .....	12 "

Total,..... 11,079

In the corresponding month in 1855, the arrivals from the continent were 19,515; in 1854, 18,349; in 1853, 21,918; in 1852, 17,870; in 1851, 21,594; and in 1850, 20,435 head.

The dead markets have exhibited unusually large supplies of meat from the country, as well as from Scotland, and a very active business has been transacted, at high quotations, beef having sold at from 2s. 10d. to 4s. 8d.; mutton, 3s. 6d. to 4s. 10d.; veal, 3s. 8d. to 4s. 10d.; pork, 3s. 8d. to 5s. 4d. per 8 lbs. by the carcase.

The month's supply of beasts from Lincolnshire, Leicestershire, and Northamptonshire has amounted to about 12,000 shorthorns; from other parts of England, 4,000 Scots, Herefords, Devons, &c.; from Ireland, 760 oxen; and from Scotland, 1,220 Scots.

In France meat is still scarce, and selling at very high prices; whilst in Spain and Portugal the quotations have not advanced in comparison with the value of other kinds of food. It is stated that a large amount of stock will be available for shipment from Holland during the coming spring.

WEST GLOUCESTERSHIRE.

Another year has nearly run its course, when the social intercourse of Christmas, and the cold though seasonable state of the atmosphere, suspend all active operations in the field; it is an appropriate time, therefore, for taking a brief review of past events. Happily the grievous predictions so liberally indulged in by alarmists at the close of the year 1855—that there would not be a sufficient quantity of wheat, the staff of life, to meet consumption—were vain delusions. Terms of peace having been determined at an earlier period than was anticipated, foreign supplies came to our shores not only sooner, but in greater abundance than the best-informed expected, and the harvest of 1855 more than realized estimates. The last harvest was an unfortunate one, and has sadly disappointed the anticipations that were formed a few weeks previous to its commencement, at which time crops of all kinds exhibited a most luxuriant appearance. The excessive dryness of the earth, and the heat of the atmosphere, at the important crisis just as the grain was coming to maturity, materially influenced the bulk, and the rain which followed when a great quantity was cut, and just in order to be carried, produced a most prejudicial effect upon the quality. There is not so much sprouted as might have been supposed, but it went into stack unhardened, and the weather subsequently has not been of that temperature calculated to improve it. The frost (which commenced in this neighbourhood on the 29th of November, and which continued till the 4th of December) was succeeded by a very damp atmosphere. The bulk being affected, samples were deteriorated rather than improved, and the weather since that time has not promoted any amendment; it still continues cold and damp. The importations of foreign corn since harvest have been extensive. This, conjoined with the inferior condition of English grain, keeps down prices, and we can foresee very little prospect of amendment. That they will fluctuate from temporary causes, is most probable; but the high prices which have prevailed during the last two years will not be repeated without some very unforeseen events, which cannot be desired. The breadth of land planted with wheat this year is about an average. This refers to the autumn-sown crop: that which will be planted in the

spring must of necessity become an item in a future report; but, from the information we are in possession of, it will not equal that of the two last years. The land is already thrown a good deal out of course, and practice does not confirm the theory that crops of the same kind can be grown in succession, whatever may be the quality of manure that is applied. That which is sown looks promising, but it is premature to anticipate the result, as so much must depend upon the elements. After-grass has continued to afford abundance of keep for stores till within the last fortnight; and the demands on the hay-ricks have therefore been very trifling; and yet, with a great supply of hay, according to the reports from all quarters, that article maintains a price higher than could have been expected. The price of stock of all kinds keeps up to former quotations. The Christmas markets have been abundantly supplied, and the shows of fat beef and mutton in the butchers' shops have never been exceeded, either in quality or quantity. The demand has been quite on a ratio with the supplies. Trade in all its departments is flourishing, and therefore the consumption of meat is considerable. While that continues farmers have no reason to fear an unprofitable reduction in the value of their produce, so intimately is the welfare of the commercial and agricultural interest blended. It is gratifying to mention the benevolent provisions made for the poor in this district by those who have the power of dispensing their liberality, and thus cheering many a desponding heart. This also suggests some remarks on the Poor Laws, which stand much in need of amendment. The season of the year likewise presents a fitting opportunity, while enjoying the festivities of Christmas, for considering the claims of the pauper community. One of the weakest points in our Poor Law administration is the absence of distinction between those who are unhappily driven to seek relief from adverse circumstances, and those who by a vicious line of conduct throw themselves without resource on the Union to which they belong. The worthless vagabond who, by a life of drunkenness, depredation, and indolence, seeks his own destitution, is treated in every respect the same as those poor creatures whose course of life has been untarnished with reproach—who have at some period enjoyed, perchance, the blessings of competency, but who have lost their all by adversity. The feeling heart mourns for their condition, but towards the drunken reprobate commiseration is but an apology for false principles. As the law now stands, no premium is offered for good conduct; but, on the other hand, the idle, abandoned vagrant is encouraged by the conviction that when premature old age and inability, conjoined with disinclination to earn his own livelihood, overtake him, he will be provided for. Without leaving the latter to absolute want, a distinction should be made, against which there are not insurmountable impediments, and the social condition of the country requires it.—Dec. 26.

#### NORTH NORTHUMBERLAND.

During the past months of the year, which will shortly be numbered with "things that have been," it has been our lot to revert frequently to the sudden changes and vicissitudes of our climate; indeed, during the entire twelve months atmospheric changes have been equally trying to vegetable and animal constitution. Without recapitulation, we shall merely revert to rural aspects subsequent to our last letter (Nov. 14), from which day the weather was moderate up to the 25th, when a snow-storm put a stop to all field operations, and which continued with frost of intense severity for ten succeeding days; after which a fresh westerly breeze melted snow and ice like magic, low grounds were in a few hours deluged, and much damage sustained by flooding where the outlet was flat or confined. Since about the 8th inst., the plough has been again at work on

favourable situations. All damp or tenacious subsoils are yet too much saturated with wet to carry the team without a bad finish. On the 12th, 13th, and 23rd, sudden changes, with copious falls of rain; 24th, cold bitter wind from the north-west, all the hill country under a covering of snow; mercury (or barometer) falls to a low mark, with every appearance of a coming storm. Such aerial phenomena cannot be favourable to the grazing of out-door live stock, and great loss from poaching and shifting sheep from the turnip-break, prejudicial to their feeding, and also to the resources of the border farmer. Notwithstanding such checks to the *onward movement*, our district presented a most creditable exhibition of fat Leeces at our great Christmas mart, held at Newcastle on the 16th. Several remarkable specimens of shorthorns and cross-bred bullocks and heifers were presented for sale, computed to weigh from 12 to 14 cwt. dead weight, exclusive of loose fat and offal; and nearly every beast was eagerly bought up by the fleshers in and around that thriving, enterprising town. The show was, taken as a whole, a grand display, comprising over eleven hundred well-finished animals; and it may be worthy of remark that we have just heard the authenticated weight of three oxen sold in the said market, from the stud of one breeder near our county town, which weighed (stripped) 113, 110, and 98 stone of 14lbs., all home-bred short-horns, 3 years 5 months to 2 years 9 months old; quantity of loose fat we have not ascertained. The sheep show at the market not so numerous as heretofore, and nothing extra as to condition. The season, so far, has been unfavourable for sheep-grazing, and real well-finished mutton scarce and in request, commanding extreme prices; nor, with a continuance of such unfavourable weather, do we see any chance for augmented supplies. Turnips are seldom stored for sheep-feeding at this period of the season, generally netted or folded on the break, or spread out daily on a piece of dry turf; the former plan generally preferred, and in dry weather sheep graze better, while the soiling from the lair of the flock materially improves a light soil for the ensuing crop. As it is, the season has been unpropitious, and so far very little wheat has been sown on such clearances. In our last we noted that turnips had made great improvement, and some very excellent crops of swedes were to be seen. By the courtesy of a gentleman farming his own land in a central part of our district, we were indulged with a walk over his fields about the last week in October. A ten-acre breadth of swedes was then ready for lifting, the crop a full plant, which were all cleared from the field by the second week in November, and realized rather over 3½ tons per acre, topped and tailed, which, with all refuse, were consumed in adjoining pastures by sheep and cattle—the bulbs safely stored. It would be needless to add, that tillage, cleaning, and manuring had been liberal; we only digress so far to impress on all practical agriculturists the imperative necessity of early storing swedes and other bulbs. Were it not that we studiously avoid personalities, many specimens of excellent management might be quoted, and, as will be found in all localities, many exceptions. Statistical calculations of the result and yield from the cereal crops of our late disastrous harvest we still must approach with caution. Few practical men can recollect such a wide difference in value, nor such deterioration in quality. We can only refer to the reports and returns from our local markets. Fine wheats for seed, or even consumption, command extreme prices, while fully three-fourths of the entire growth sells at ruinous prices down to 20s., or even less, per qr. Oats and Barley in proportion. Beans and Peas better, and more even in quality. Potatoes from one-third to one-half spoiled. With such aspects, it is not the less true that competition for farms out of lease continues keen. Demand for drain material and labour exceeds supply; and with a continued excess of consumption of every article wholesome for food, we may argue that "a better time is coming." Yet let not man forget that the seasons are at the disposal of a gracious Providence. Neither high farming, improved machinery, or lambing kilns for drying corn in the sheaf will save a large crop; a good season, or short dry intervals, must be studied or worked at, when they occur, with vigilance. Very stormy, sleet and snow; wind north-east.—Dec. 25.

## REVIEW OF THE CORN TRADE, DURING THE PAST MONTH.

The past month commenced with a frost of extraordinary intensity, calculated to check the over-luxuriance of some of the early-sown wheat, and greatly to improve the condition of all that was stacked or in the barn. These effects were partially produced, and many samples were sent to market in much improved condition, to the sellers' advantage in the readiness of sales, as well as an improvement in price; but a complete thaw ensuing before an entire week had passed, trade has fallen into the same dull state complained of in the previous month; and without oppressive quantities of English produce in any markets, the failure of the condition has brought a further reduction in price of about 3s. per qr. This, however, would not have occurred but for the continued influx of foreign arrivals, principally Russian, with a fair portion of the new crop of the United States, in fine condition, so that millers have been at no loss to keep up the quality of their flour; while the lower descriptions, as well as most of the hard wheat, have found a ready vent for Spain and Portugal at full rates, the deficiencies of those countries greatly exceeding the first calculations, and promising to last till their next harvest.

The sudden frost influenced the markets in the North of Europe and Baltic considerably downwards, as all chance of further business seemed gone, and holders were left to speculation among themselves, or to orders for spring delivery; and the superiority of American samples, at comparatively easy rates, placed them in a discouraging position. The thaw having re-opened Hambro' and some other ports, with the help of artificial means, many of the liberated vessels have since arrived; but a large fleet still remains between Cronstadt and St. Petersburg, with very little prospect of an early release. The near ports of Holland and Belgium have all been declining, and France has found but a very languid demand for her generally inferior crop, excepting the Southern ports bordering on the provinces where there is an acknowledged deficiency; but even these have only been sustained by the inquiries for Spain, which have had the same effect on some Italian ports that were becoming depressed. At Madrid as high as £5 10s. has been realized for wheat, and there were fears for a time as to a sufficient provision for the city, high prices being universal throughout the country. Low rates still obtain in the Two Sicilies

and Roman States, but they are produced by the prohibition to export, and not from an abundance, which this season is only found in available qualities in America and Russia. To these countries, therefore, we must chiefly look to help off our own damp produce, as that sent from Egypt is too low for the English market. If in the South complaints are general, in the North they are still more serious, the late returns of the produce of Scotland exhibiting a serious deficiency in the yield of potatoes—viz., 43 per cent.; and though the acreable increase of the growth of wheat is not much below this, the yield per acre is so short, and the whole crop of cereals so damaged by wet, that it is computed that no such injury has occurred since 1816. Prices may nevertheless again droop for a time, especially if samples unfit for the miller are pressed on the market; but we cannot help thinking that towards the close of the season there will be some rally, if not before then, and that the growth of corn in 1856 throughout the world, especially of wheat, will do very little more than meet the demands of a year. Canal navigation having closed in the Northern States of America and Canada, our supplies for a time must be drawn from the South, which will doubtless be sufficient till spring, when the greater facilities afforded by new lines of rail must occasion a renewal of very free shipments. The last quotations at New York were, for the best red wheat, 53s. per qr., and the best white 57s. 6d. For spring shipment in the Baltic they were, at Rostock, 52s. to 53s. for 60lbs. wheat; at Copenhagen, for dried 60lbs. wheat, 50s.; 61lbs., 51s. 6d. The best home-grown French was about 65s. per qr. In the Danube—Galatz wheat was worth 46s., and best Kalafat 53s.; while at Odessa prices ranged from 55s. 6d. to 63s. 6d. per qr. free on board, showing that the late large arrivals from this port must occasion a heavy loss to importers.

The first Monday in London opened with the advantage of a smart frost, though on good arrivals of foreign wheat, the morning's supply from the near counties being scanty. Sales of English, as well as foreign, were then made at firm prices, but without any advance on the previous rates. Most of the country markets followed London, and only noted dulness at previous rates; but some were lower, Bristol, Norwich, and Newcastle being 1s. to 2s. down. Liverpool also receded 2d. to 3d.

per 70lbs. on the first market, and on Friday there was a further decline of 1d. to 2d.

The second Monday was well supplied with English and abundantly with foreign Wheat, in which there were 7,000 qrs. from America and 14,000 from Russia. The weather then had completely changed to mild and damp, the condition of the samples being correspondingly deteriorated, which deterred millers from buying, though the rates were nominally as before; most of the English supply was therefore left unsold. Many of the country markets exactly agreed with London; but some places of importance were lower 1s. to 2s., as Hull, Manchester, and Bristol, while both the markets at Liverpool successively described lower prices, Tuesday being 2d. to 3d. per 70 lbs. cheaper, and Friday 1d. to 2d. further down.

The third Monday, without heavy arrivals of English or foreign, was a day of perfect paralysis, the last country markets seeming to influence millers unusually, the condition not being so much worse as to account for their inaction. English factors could scarcely get a bid, and were so determined to sell, if favoured with an opportunity, that they would have accepted 4s. per qr. less money; this being known only added to the difficulty, and the market became nominal, the almost entire bulk being passed over to the next market: the following days settled the decline at fully 2s. to 3s., with some little left over at the week's end. Scarcely any of the country markets exhibited such a state of suspense or decline; but none reported a better state of trade, the general average of the principal places being about 1s. to 2s. down, though Sleaford equalled London in the reduction of prices. The only change at Liverpool was a fall of 3d. to 4d. on Tuesday, with some recovery as respects the business done on Friday.

The fourth Monday exhibited an unusual supply of foreign samples, though the English were only moderate, altogether the show from Kent and Essex being small. Though it was known there would be no market held on Wednesday, buyers seemed all under the influence of the approach of Christmas, and scarcely any transactions were effected. Some few assembled on Wednesday, who disapproved of the closing of the market, and a small private trade passed between them. On Friday there was a little more tone in business, and the nominal rates of Monday were realized. This week in the country showed some variety, several markets noting lower rates by 1s. to 2s., and about an equal number as to their importance reporting as much advance. Hull was so much cheaper, but Lynn was 1s. higher, and Birmingham

and Manchester up 1s. to 2s. Liverpool also was 2d. per bush. higher, with some speculation.

On the last Monday in the month and year the Wheat trade commenced on fair arrivals, both in English and foreign samples; but the morning's supply from Kent and Essex was unusually scanty. The trade was evidently improved, and in many instances needy buyers had to pay 1s. per qr. more money, all foreign of good quality being firmly held.

The month's supplies have been as follows: In English wheat the receipts have been 44,596, in foreign 128,001 qrs., being a weekly supply of 8,919 English, and 25,600 foreign, showing a weekly decrease in the former as compared with November, and an increase in the latter. The total exports during the month have been almost exclusively to the Peninsula. Though weekly sales have still been less than last year, and the decline in the averages has been 2s. 10d. In the London averages it has been 3s. 4d. per qr. The imports into Great Britain for five weeks ending 17th December were 558,633 qrs., including flour.

The flour trade through the month has been heavy, with but small fluctuations. Town-made samples have not been reduced in price, the millers finding it difficult to keep up the character of their best flour without paying very high rates for the best foreign wheat, as much as 90s. being paid for extra Danzig, and 80s. for fine new American. Norfolks first advanced 1s. by the help of frost, and afterwards receded 3s. gradually, from the abundant supplies and return of damp weather. American at first went off well; but the continued supplies, though generally of good quality and varying in value little more than 3s. per brl., being beyond the present consumption, they have receded fully 2s. 6d. per brl., leaving the top price at about 36s. per brl. The arrivals have been as follows, showing a liberal increase as compared with last month both in English and foreign:—Of country sacks there have been received 90,296 English, and 99,643 brls. and 2,458 sacks of foreign, showing a weekly excess over last month of 1,709 sacks of English, and 14,182 brls. with a small deficiency in foreign sacks.

The barley trade through the month has been so equal in the several weekly London markets that it is unnecessary to particularize each. Suffice it to say that the demand for fine samples has been so on the increase that some country markets have quoted higher prices, though in town scarcely any change has been made in the quotations; the secondary and inferior sorts occasionally flagging, though distillers have been large buyers, and often anticipated foreign arrivals. The supplies during the month have been only moderate; viz.: 29,590

qrs. English and 44,621 qrs. foreign, or only about 1,000 qrs. more weekly in foreign than in November.

Malt has been equally steady in price; the currency having little varied, though prices have been firm.

In oats, also, there has been very little change. The first Monday had a firm aspect on short supplies; the second was oppressed by the quantity of foreign, but did not give way for fine old samples; the third, with scanty arrivals, showed no improvement, the previous glut not being used up; the fourth, with a moderate supply, found business only dull; and the fifth Monday still found a steady trade at unaltered rates, the diminished arrivals, as compared with the previous month, working off the surplus stock into consumption, and no further heavy supplies from abroad, or even Ireland, being anticipated. The supplies have been 6,294 qrs. English, 3,189 qrs. Scotch, 28,705 qrs. Irish, and 104,247 qrs. foreign; showing a total weekly average of 28,487 qrs., or 15,842 qrs. less per week than in November, a falling off to half the quantity being observable in shipments from Ireland, and to two-thirds from foreign ports. Some of the Scotch samples have been excessively damp and scarcely fit for use. As the Baltic is now closed, it seems scarcely probable that lower prices can be expected.

Beans and peas have been constantly receding, especially the latter, white boilers having become quite a drug, without any quantity being pressed for sale. Beans through the month have declined about 2s., and soft new samples still more. Hog peas have receded in value to the same extent, but white and blue have reduced in value 5s. per qr., with much difficulty in sales; as these have now reached a point of depression which has made them on a parity with hog feed, they can scarcely go lower, and should sharp weather return, as may be reasonably expected, we may see a rally in prices. The supplies were during the month—Beans, 4,222 qrs. English, and 8,980 foreign, exhibiting a weekly increase of both English and foreign; and Peas, 3,198 English and 7,960 foreign, the English receipts being less, and the foreign arrivals trebled.

Linseed has been still forced up by the fact that supplies have been below the demand, the rise in the month being about 3s. per qr., while cakes have found an unusually free sale on full terms, graziers being well satisfied with the prices made of their fat stock. With the projected extension of railroads on the continent, and indeed throughout every civilized part of the world, there seems no prospect of any diminution of the rates till an extended growth and successful crop brings an

over-supply. Of linseed during November the receipts were 20,463, or only 4,092 qrs. weekly.

The seed trade has been in a dragging state. So small a demand for cloverseed has seldom been experienced, but the reason may be found in the high rates which the growers of red in the South of France have demanded for their samples, on the plea of a defective crop, 68s. being still required for second-rate Bourdeaux; it being also doubtful how far the English crop may require foreign help, though it is known to be generally damp, and partly damaged. Trefoil has been steady, but is now offered lower in France, from the absence of inquiry. Canaryseed has been a very heavy sale, at rather lower rates. Hempseed, though low-priced, has found but a very limited demand. Rapeseed has only sold at high rates for seed in retail. Mustardseed has continued quite neglected, holders and dealers declining to give way. In coriander, carraway, and other seeds very little alteration has to be noted, either in the state of trade or prices.

#### CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter
WHEAT, Essex and Kent, white, new	54 to 65 extra — to 72
Ditto, red .. .. .	53 60 — 66
Norfolk, Lincoln and Yorksh., red ..	52 60 — 66
BARLEY, new, malting .. 36 39 .. .	Chevalier .. 42 50
Distilling .. . . .	37 38 .. . Grinding .. 31 33
MALT, Essex, Norfolk, and Suffolk .. .	67 72 .. . 77
Kingston, Ware, and town made ..	69 73 .. . 79
Brown .. . . .	63 64 .. . —
RYE .. . . .	— — 38 42
OATS, English, feed .. 24 25 .. .	Potato .. 25 32
Scotch, feed .. . . .	26 30 .. . Potato .. 27 33
Irish, feed, white .. . . .	21 26 fine 26 30
Ditto, black .. . . .	20 24 .. . 26
BEANS, Mazagan, new 33 34 .. .	Ticks, new 34 35
Harrow .. . . .	38 41 .. . Pigeon .. 42 43
PEAS, white boilers 40 43 .. Maple 40 41 ..	Grey 33 39
FLOUR, per sk. of 280 lbs., Town, Households 58s., fine 60	Country 42 43 .. . Households .. 46 48
Norfolk and Suffolk, ex-ship .. . . .	41 42

#### FOREIGN GRAIN.

	Shillings per Quarter
WHEAT, Dantzic, mixed .. 75 77 high do. — 80 ext. —	82
Konigsberg .. . . .	73 77 .. . 77 — 84
Rostock .. . . .	72 76 fine .. — 80 — 84
American, white .. . . .	64 70 red .. — 60 65
Pomer., Meckbg., and Uckermark, red	71 75 73 77
Silesian, red .. . . .	66 71 white .. — 71 75
Danish and Holstein .. . . .	60 65 63 70
St. Petersburg and Riga .. . . .	55 60 fine 60 68
Rhine and Belgium .. . . .	— — — —
Ruseian, harl. .. . . .	57 72 .. . French .. (none)
BARLEY, grinding 25 32 .. . . .	Distilling .. 34 37
OATS, Dutch, brew, and Polands 24 30 ..	Feed .. 20 25
Danish and Swedish, feed .. 21 26 ..	Stralsund 25 27
Russian .. . . .	— — — — 23 26
BEANS, Friesland and Holstein .. . . .	40 42
Konigsberg .. 37 42 .. . . .	Egyptian .. 35 36
PEAS, feeding .. . . .	39 40 .. fine boilers 40 42
INDIAN CORN, white .. . . .	34 36 .. yellow .. 32 37
FLOUR, per sack .. . . .	French 56 .. . Spanish .. —
American, per barrel, sour 30	31 .. sweet .. 33 37

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.		Barley		Oats.		Rye.		Beans		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Nov. 15, 1856 ..	64	4	46	7	26	2	41	7	47	3	43	2
Nov. 22, 1856 ..	63	3	45	7	25	7	40	4	46	3	43	6
Nov. 29, 1856 ..	61	11	44	11	24	8	42	0	45	6	43	1
Dec. 6, 1856 ..	60	11	43	10	25	0	38	11	44	5	41	1
Dec. 13, 1856 ..	60	1	43	1	23	5	42	1	43	7	41	10
Dec. 20, 1856 ..	60	5	43	10	25	6	40	2	42	8	40	9
Aggregate average	61	10	44	8	25	1	40	10	44	11	42	3
Sametime last year	31	0	41	2	28	1	53	8	51	11	50	8

LONDON AVERAGES.

Wheat, qrs. 3,078	£3	5	5	Rye .. qrs.	—	£0	0	0
Barley... 2,204	2	3	10	Beans... 481	1	19	7	
Oats .... 248	1	6	4	Peaa.... 267	2	4	4	

COMPARATIVE AVERAGES—1856-55.

From last Friday's Gaz.	s.	d.	From Gazette of 1855.	s.	d.
Wheat ... 108,645 qrs.	60	5	Wheat... 108,115 qrs.	78	9
Barley... 105,088 ..	43	10	Barley... 130,121 ..	40	4
Oats .... 20,440 ..	25	6	Oats .... 26,538 ..	27	1
Rye..... 336 ..	40	2	Rye..... 191 ..	51	6
Beans... 6,710 ..	42	8	Beans... 5,213 ..	50	8
Peas .... 3,617 ..	40	9	Peas .... 2,767 ..	48	11

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	Nov. 15.	Nov. 22.	Nov. 29.	Dec. 6.	Dec. 13.	Dec. 20.
64s. 4d.	..	..	..	..	..	..
63s. 8d.	..	..	..	..	..	..
61s. 11d.	..	..	..	..	..	..
60s. 11d.	..	..	..	..	..	..
60s. 5d.	..	..	..	..	..	..
60s. 1d.	..	..	..	..	..	..

PRICES OF SEEDS.

BRITISH SEEDS.

Cloverseed, red, (per cwt.)	—s. to —s.
Ditto white	—s. to —s.
Trefoil, (per cwt.)	—s. to —s.
Tares, winter (per bushel)	5s. 0d. to 6s. 0d.
Coriander (per cwt.)	20s. to 24s.
Canary (per qr.)	70s. to 78s.
Hempseed (none)	—s. to —s.
Carraway (per cwt.)	new —s. to 50s., old —s. to —s.
Linseed (p. qr.) sowing	—s. to —s., crushing 65s. to 67s.
Linseed Cakes (per ton)	£10 10s. to £11 0s.
Rapeseed (per qr.)	new 86s. to 88s.
Ditto Cake (per ton)	£5 0s. to £5 10s.

FOREIGN SEEDS, &c.

Cloverseed, red, French	—s. to —s.
Tares, old (per bushel)	5s. 0d. to 5s. 6d.
Hempseed, small, (per qr.)	—s. 42s., Ditto Dutch, 44s.
Coriander (per cwt.)	15s. to 20s.
Carraway	42s. to 46s.
Linseed (p. qr.) Baltic, 63s. to 65s., Bombay, 64s. to 66s.	
Linseed Cake (per ton)	£11 0s. to £11 10s.
Rapeseed, Dutch	76s. to 80s.
Rape Cake (per ton)	£5 0s. to £5 10s.

HOP MARKET.

LONDON, MONDAY, Dec. 29.—We have no alteration to note in our market since our last report. The demand for all fine Hops has continued steady, and fully as much money is obtained for such descriptions as during the past week.

There is also a fair business doing in fine yearlings, and the trade on the whole is good for this period of the year.

NEW YORK HOP MARKET, Dec. 12.—Only a moderate business has been done the past week. The sales do not amount to over four hundred bales, the half of which were purchased for filling contracts. We quote 7 to 10 c. for common to good first sorts Eastern and Western; very choice lots in small parcels would bring 11c., but the previous are fair quotations of the general market. Old have ruled quiet at 4 to 5 c.; a small lot sold at the latter price.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Dec. 29.—During the past week arrivals coastwise and by rail have again been greater than the demand, in consequence of which, a considerable fall in prices has taken place. The following are this day's quotations:—

York Regents	90s. to 120s.
Kent and Essex do.	90s. to 120s.
Lincolnshire do.	70s. to 100s.
East Lothian red	80s. to 90s.
Perth, Forfar, and Fifeshire	
Regents	85s. to 95s.
Irish whites	70s. to 80s.
German do.	70s. to 80s.

BOROUGH AND SPITALFIELDS, LONDON, MONDAY, Dec. 29.—Since our last report, only moderate supplies of home-grown potatoes have come to hand, coastwise and by railway. The imports have amounted to 510 bags 2 baskets from Rotterdam, 280 bags from Schiedam, 8 from Limerick, 560 from Belfast, and 1 box 3 barrels from Jersey. About an average business is doing, as follows:

York Regents	95s. to 120s.
Kent and Essex ditto	90s. 120s.
Lincolus	75s. 110s.
Scotch	95s. 120s.
Ditto reds	95s. 110s.
Irish Whites	80s. 90s.
Dutch ditto	80s. 90s.

COUNTRY POTATO MARKETS.—YORK, Dec. 20: A fair supply of Potatoes, which sold at from 8d. to 9d. per peck and 2s. to 2s. 6d. per bush.—LEEDS, Dec. 23: A fair show of Potatoes, which sold at from 10½d. to 11d. wholesale, and 11d. to 12d. per 21lbs. retail.—MALTON, Dec. 20: A moderate supply of Potatoes, sold at 12d. per peck.—RICHMOND, Dec. 20: Potatoes 4s. per bush.

FAIRS, &c.

BANBURY FAIR.—A good supply of beef: prices at from 4s. to 4s. 8d. per stone. The supply of mutton very small—from 4s. 8d. to 5s. per stone.

BEDALE FORTNIGHTLY FAIR.—We had a poor supply of beasts and sheep, all the Christmas stock being shown the preceding week. A fair show of in-calving cows and lean stock. Business was slow, and the prices of in-calvers tended downwards. Beef, 6s. 9d. to 7s. 6d. per stone; mutton, 6d. to 6½d. per lb.

LEDBURY FAIR was tolerably well supplied with fat and store stock. Buyers were numerous, and prices were higher, more especially for fat cattle. Fat cows, 6d. to 7d.; ditto sheep, 5½d. to 6½d. per lb.

MONTGOMERY FAIR was rather thinly supplied with stock. There were a few excellent cows, which were readily sold at 6½d. per lb. Useful store cattle sold well; cows and calves realized high prices; fat sheep, 7d.; pork, 6d. to 6½d. per lb.; store pigs a shade lower from last fair.

SHREWSBURY FORTNIGHTLY FAIR.—The best beef sold well, from 6½d. to 6¾d. per lb.; inferior cows, 6d.; good cows and calves made great prices, also useful store cattle; fat calves, 6½d.; fat wether sheep, 7½d.; ewes, 6½d. to 7d.; fat pigs, 6d.; store pigs selling at high prices.

TADCASTER FORTNIGHTLY MARKET.—We had a fair supply of stock. Beef, 7s. to 7s. 9d.; pork pigs, 7s. 4d. per stone; mutton, 6½d. to 7½d.; veal, 7d. per lb.

YORK FORTNIGHTLY MARKET.—Calving and dairy cows met with a check both in demand and prices, they being sold for 20s. to 30s. below former rates, and many remained unsold late in the afternoon. All kinds of grazing beasts were in good supply and demand, at about former rates. A fair amount of business was transacted in them, solely on account of favourable out-door keep. Fat beasts were in limited supply and request, at 7s. to 7s. 6d., and very prime ones, at 8s. per 14lbs. The trade, upon the whole, on account of the high prices, was precarious. There were very few mutton sheep for sale, and they were not sold off until the afternoon.—Ewes, 6½d. to 7d.; middle hogs and wethers, 7d. to 7½d. per lb.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Table with columns for BUTTER, CHEESE, and HAMS, listing various types and their prices per cwt. or dozen.

ENGLISH BUTTER MARKET.

CITY, MONDAY, Dec. 29.—With an inactive trade in Butter we are without any alteration in prices except for fresh. Dorset, fine 120s. to 122s. per cwt. Do. middling 108s. to 110s. Fresh 12s. to 16s. per doz.

GLOUCESTER was but scantily supplied, only about fifty tons brought to market, and the quality of which was rather inferior. The following were the prices obtained: Single 58s. to 60s., seconds 48s. to 54s., skim 24s. to 28s. There was only one lot of double brought to market, which sold at about the prices quoted last week.

GLASGOW, (Wednesday last).—First class new 64s., second 52s., and skim milk 34s.

BELFAST, (Friday last).—Butter: Shipping price, 104s. to 120s. per cwt.; firkins and crocks, 11½d. to 12½d. per lb.; Bacon, 60s. to 66s.; Hams, prime, 80s. to 86s., second quality 70s. to 76s.; prime mess Pork, 95s. to 96s. per brl.; Pork, 56s. to 61s.; Beef, 100s. to 120s. per tierce; Irish Lard, in bladder, 74s. to 76s.; kegs or firkins, 68s. to 70s. per cwt.

WOOL MARKETS.

BRITISH WOOL MARKET.

CITY, MONDAY, Dec. 29.—Since Monday last there has been some disposition to speculate in our market, and some rather large parcels have been taken at extreme quotations. For actual consumption we continue to have a fair demand, and the future prospect of the market is highly favourable. The stock held here is very moderate.

LEEDS WOOL MARKET, Dec. 26.—The present being Christmas week, has been partially a holiday; consequently, the purchases by the manufacturers have, as usual, been less extensive. Prices are firm at last week's rates, with an upward tendency.

LIVERPOOL WOOL MARKET, DEC. 27.

SCOTCH WOOL.—There is still an active demand for all kinds of Scotch wool at rather improving rates.

Table listing prices for Laid Highland Wool, White Highland do., Laid Crossed do., Laid Cheviot do., and White Cheviot do. with prices in s. d. and £ s. d.

FOREIGN WOOL.—There is an increased inquiry for all kinds of useful long-stapled wools. The stocks, however, are so light, there is little to do; but that little is at improving rates. Public sales are fixed to take place here on the 15th January and following days, when about 11,000 bales of East India and about 4,000 other sorts, including about 2,500 ballots of Peruvian, will be offered.

FOREIGN WOOL MARKET.

CITY, MONDAY, Dec. 29.—At Marseilles, the market is described as having been very animated; and owing to the shortness of the supply, prices had a strong upward tendency. The finer kinds of Buenos Ayrean wool had been in demand, at an advance of 10 per cent.; while common kinds were at an improvement of 5 per cent. At the public sales full prices were realized. The German markets are firm.

LEEDS FOREIGN WOOL MARKET, Dec. 26.—There has been quite an average demand for the close of the year, and prices are fully supported.

NEW YORK WOOL MARKET, Dec. 12.—Native fleece and pulled Wools continue in good demand, but the transactions are somewhat restricted, owing partly to the meagre stock and the extreme prices asked; the stock of

pulled, especially, is very low. The transactions comprise 100,000 lbs. in lots, at 45 to 48 c. for medium and super fleeces; 50 to 55 c. for super extra ditto; and some few choice parcels of Saxony, at from 58 to 62½ c., six months. Of pulled, some 15,000lbs. have been disposed of at 39 to 40 c. for super, and 45 to 46 c. for extra country. California Wool is in good supply, and we note further sales of 250 to 300 bales unwashed fleeces on private terms. There continues a good inquiry for most kinds of foreign Wools; but the small stock offering, and the high prices asked, limit transactions to some extent. The sales comprise 150 bales washed Cordova and Persian, at 27 to 28 c. respectively; and 75 bales unwashed South American and Entre Rios, at 15 c. and 16½ c., six months.

COVENT GARDEN MARKET.

LONDON, SATURDAY, DEC. 27.—Supplies of most things continue to be sufficient for the demand, and trade is tolerably brisk. Pine Apples and hothouse Grapes may still be had at last week's quotations. Pears are dear, Dessert Apples also realize high prices, and good varieties for kitchen use are scarce. There is still a fair demand for Kent Cobs, at 110s. per 100 lbs.; Barcelona Nuts, 20s. per bushel; New Spanish and Brazils, 18s. do. Chestnuts are fetching from 14s. to 21s. per bushel. Oranges are tolerably abundant. All kinds of vegetables in season are well supplied. A few samples of French Asparagus have made their appearance. Seakale and Rhubarb may also be obtained. Portugal Onions fetch from 9s. to 16s. per 100, or from 2s. to 3s. per dozen. Potatoes realize fair prices. Cut flowers consist of Orchids, Heliotropes, Gardenias, Violets, Camellias, Mignonette, Heaths, and Roses.

FRUIT.

Table listing prices for Pineapples, Grapes, Melons, Oranges, Lemons, Pears, Apples, Filberts, Kent Cobs, and Almonds.

VEGETABLES.

Table listing prices for Cabbages, Broccoli, B. Sprouts, Asparagus, Rhubarb, Seakale, French Beans, Potatoes, Do. per bush., Carrots, Turnips, Spinach, Cucumbers, Beet, Celery, Leeks, Onions, Capsicums, Shallots, Garlic, Lettuce, Endive, Radishes, Small Salad, Horseradish, Mushrooms, Parsley, Majoram, Savoy, and Chilies.

MANURES.

Table listing prices for PERUVIAN GUANO, Do. (under 30 tons), and BOLIVIAN GUANO.

ARTIFICIAL MANURES, &c.

Table listing prices for Nitrate Soda, Nitrate Potash, Sulph. Ammon, Moriate ditto, Superphosph. of Lime, Soda Ash, Gypsum, Coprolite, Sulph. of Copper or Roman Vitriol, Steeping, Salt, Bones, Dust, Do. 3-inch, Oil Vitriol, concentrated, Do. Brown, and Sawdust.

OIL-CAKES.

Table listing prices for Linseed-cakes, Thin American, Thick do. round, Marseilles, English, and Rape-cakes.

JOHN KEEN, 35, Leadenhall-street, (Late Odams, Pickford, and Keen.)

Williams & Co., 24, Mark Lane—Azote. Manufactured by Hodgson & Simpson, Wakeneld, and Matthews & Co., Driffield.

Table listing prices for Ammonia-Phosphate and Nitro-Phosphate, and Superphosphate of Lime.

Table listing prices for Agricultural Chemical Works, Stowmarket, Suffolk; Prentice's Cereal Manure for Corn Crops; Prentice's Superphosphate of Lime; Laneshire Manure Company, Widnes, near Warrington; J. Knight & Co.'s Nitrogenized Bone Manures; and Tigar & Co.'s Calcinated Turnip Manures.

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# THE FARMER'S MAGAZINE.

FEBRUARY, 1857.

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## PLATE I.

“THE QUEEN OF THE MAY;”

A SHORT-HORN HEIFER,

BRED BY AND THE PROPERTY OF RICHARD BOOTH, ESQ., OF WARLABY, NORTHALLERTON,

Calved November 5th, 1854, and was got by Crown Prince (10087), dam (Red Rose) by Harbinger (10297), g. d. (Medora) by Buckingham (3239), gr. g. d. (Monica) by Raspberry (4875), gr. gr. g. d. (White Strawberry) by Rockingham (2551), Strawberry 2nd — by Young Alexander (2977), — by Pilot (496), — by the Lame Bull (359), — by Easby (232), — by Suworrow (636).

See *Coates's Herd Book* for Red Rose, the dam of the Queen of the May, vol. xi., p. 660.

The Queen of the May, a roan heifer, is in almost every respect the model of what a short-horn cow should be—extraordinary for chine, hip, and tut, with a very good back, beautiful head, and excellent quality. She was only shown three times last year—of course her first season—when she took the first prize as the best yearling at the Royal Agricultural Society's Meeting at Chelmsford; the first prize at the Yorkshire Society's Meeting at Rotherham; and the first prize at the Durham County Show at Durham.

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## PLATE II.

R A T A P L A N .

Rataplan, bred by Captain Thellusson in 1850, was got by the Baron out of Pocahontas, by Glencoe, her dam Marpessa by Muley—Clare by Marmion—Gohanna.

The Baron, bred in Ireland by Mr. Watt in 1842, was got by Birdcatcher, out of Echidna, by Economist. At the sale following the decease of Mr. Theobald, in 1850, he was knocked down to a French commissioner for 1,010 guineas. His stock, which came out as two-year-olds in 1851, include in the list of winners with us Aitchbone, Benita, Chief Baron Nicholson, and Lady Isabel; the first year of his three-year-olds producing a St. Leger winner in Stockwell, own brother to Rataplan. In France he has also been very successful, and his departure from his country after so brief a trial is looked upon as a national loss.

Pocahontas, bred by the late Mr. Forth in 1837, was put to the stud in 1842. Here, up to the Baron cross, she showed with but little success—Cambaules and Dolly Varden being amongst the most remarkable of her produce. The latter was one of the plainest mares we ever saw. Indeed, Pocahontas is not famous for throwing them very handsome. They are, however, often something better, as witness her three celebrated sons, Stockwell, Rataplan, and King Tom. At Mr. Theobald's sale the mare was knocked down to Captain Thellusson for 260 guineas, and she has since been again sold to Lord Exeter.

Rataplan is a dark chesnut horse, with white ticks, standing sixteen hands high. He has a rather  
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plain but very expressive head, with a strong neck, shoulder somewhat inclined to be upright, and immense chest. He has a short strong back, powerful quarters also inclining to be short, and arms, gaskins, knees, hocks, and bone quite equal to carrying sixteen stone over a country. He is, in fact, an immensely powerful horse, with something remarkably "prepossessing in his appearance," carrying his bushy tail well away from him, and walking along in the most careless indolent manner. He is a terrible slug in his slow paces, and takes altogether a deal of rousing.

Rataplan was sold at the hammer in March last to Mr. Foljambe for 2,000 guineas, and '56 was his first season as a stud horse. He is advertised for at Tickhill Castle Farm, with a subscription of 40 mares at 25 guineas each.

## THE EFFECTS OF THE EXPOSURE OF ANIMALS TO A LOW TEMPERATURE AND TO MOISTURE.

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

The readers of this magazine will, on many occasions, have noticed the effects produced on domestic animals from exposure to low and sudden transitions of temperature. The hollow coughs which resound along the London cab-stands remind even the citizen of this truth. Does the reader remember any neighbour whose stock is allowed to lie out unsheltered? or perchance in an ill-enclosed undrained yard? Does he not notice the staring coats? the poor, spiritless condition of the animals? Is not their owner of the class sometimes very erroneously called "the unlucky"? Is he not anxious to get the lives of his poor beasts insured in some defraudable Cattle Insurance? or, failing that resource, is not a parish subscription attempted ever and anon, in behalf of the unhappy dispirited owner? It is true these startling instances are not usually found amidst the better classes of farmers; and yet amongst these, even with those who have laid all science under contribution, the effects of low and changeful temperature may still be studied with advantage; and at no period more practically so, than in this month of February—one of the worst, perhaps, in the calendar, for stock.

But in gathering together a few facts on the results of temperature, the farmer must not consider that even the researches of the most profound philosophers have nearly made us acquainted with the effects of low temperature upon organized matter. Every now and then certain facts present themselves—new readings in Nature's exhaustless book, which excite in us the just suspicion that our theoretical explanations are yet far from the real truth—that they will one day have to give way to other perhaps still imperfect theories. Let me give an instance of these mysteries: We are all aware that in a temperature at or below the freezing point of water, all decomposition of organic matters ceases. The Russian preserves his meat during his long

winters merely packed in snow: during our English frosts the same effect of a low temperature is noted. No one, till lately, has even suspected that by exposing the meat to a much lower temperature—that then the meat would begin to putrefy; yet such are the phenomena which present themselves in the Arctic regions. Dr. Kane thus briefly tells the story, in a work which will be read with deep interest for its many other valuable observations. After stating (vol. ii. p. 51) that on the 23rd of February they had been so fortunate, on their frozen sea, as to kill a deer, he adds in his journal of the next day: "Bitter disappointment! the flesh of our deer is nearly uneatable from putrefaction. The rapidity of this change in a temperature so low as 35 degrees below Zero seems indeed curious. But the Greenlanders say that extreme cold is rather a promoter than otherwise of the putrefactive process. Our buffalo hunters, when they condescend to clean a carcass, do it at once. They have told me that the musk ox is sometimes tainted after five minutes' exposure. The Esquimaux in latitude 73.40, even in the severest weather, are in the habit of withdrawing the viscera of their game immediately after death." Even in such a frozen land of desolation the greater effect of certain kinds of animal food in keeping up the warmth of the living has not escaped the observation of these ice-encircled savages. When speaking of that curious animal, the walrus, the Doctor continues: "Its delicately permeating fat—oh call it not blubber!—assimilate it rather to the fat of the ox; it is beyond all others, and the very best *fuel* a man can swallow." That such food enables the natives to withstand their intense frosts is evident, for Dr. Kane tells us in another place that the Esquimaux will sleep in their sledges when the temperature of the atmosphere is 93° below the freezing point of water. Well might he feel convinced that his gallant and unconquerable

band of explorers were mere carpet knights beside these indomitable savages!

Such facts will not be unproductive of advantage if, I repeat, they serve to lead us to the conviction that we have yet other things to ascertain with regard to the most profitable temperature in which our domestic animals should be placed. I have already alluded to the trying nature of the month at which we have now arrived—the cold wet weather, which at this season mingles with the cold winds; at a time, too, when the minimum temperature of the year, on an average of our seasons, has only just been passed. That annual minimum, at several places on the Continent of Europe, has been noted by Colonel Sabine; he records that the lowest temperature of the year on an average occurs—

At Königsberg . . . . .	about	January 9th
— Berlin . . . . .	between the	12th and 19th
— Prague . . . . .	between the	19th and 26th
— Paris . . . . .	about the	15th
— Turin . . . . .	„	3rd
— Padua . . . . .	„	15th

At Toronto, in Upper Canada, the minimum temperature is not attained till about the 12th or 14th of February.

That exposure to cold renders it necessary for the animal to sustain itself by an increased consumption of food, is evident enough from the effect of exposure to a low temperature on even our own appetites. The chemical explanation of this phenomenon has been given by Dr. Lyon Playfair. He observes (*Jour. R.A.S.*, vol. iv., p. 217), after reminding us that the temperature of the bodies of our cattle is about 100 degrees, or more than 40 degrees higher than the ordinary temperature of this climate, and that hence there must be some provision in the animal body to sustain the heat which the colder air constantly withdraws from it—after reminding us of these things, he asks the seldom-considered question, “Whence, then, comes the fuel for the production of the heat?” That fuel, he proceeds to inform his readers, consists of those ingredients of food from which nitrogen is absent: these all contain carbon. We know that oxygen is continually inhaled in the air we breathe, and that it is never again expired as such. Expired air consists of carbonic acid gas—a gas composed entirely of carbon and oxygen: in the body, therefore, the oxygen has united with carbon; or, in other words, it has produced the very gas which is obtained by burning a piece of charcoal in the open air. Now, the heat generated by the combustion of the carbon in the body must be exactly equivalent to that produced by burning the same amount in the atmosphere. It has been found by experiment that the carbon (14 oz.) daily consumed on

an average by a man is equal to the production of 197,477 degrees of heat; a cow consumes about 70 oz. of carbon daily, and this must, according to careful calculation, produce by its combustion 987,385 degrees of heat. Now, it is evident that the lower the temperature to which we expose an animal, the greater will be its demand of carbon or food to retain its natural temperature; or as the Professor puts it—and his observations serve materially to elucidate some of the phenomena on which we have been dwelling—“as the heat of the animal body is the same in all regions, it is obvious that the quantity of fuel (food) necessary to sustain the constant temperature of the body must vary according to the nature of the climate. Thus less food is required for this purpose in India, where the temperature of the external air equals that of the body, than in the polar regions, in which it is very many degrees lower. But a beneficent Providence has arranged the produce of different countries so as to meet the exigencies of the climate. The fruits upon which the inhabitants of warm countries love to feed contain only twelve per cent. of carbon, while the train oil enjoyed by the inhabitants of arctic regions contains about seventy per cent. of the same element. ‘Were we,’ says Liebig, ‘to go naked like certain savage tribes, or if in hunting and fishing we were exposed to the same degree of cold as the Samoyedes, we should be able with ease to consume 10lbs. of flesh, and perhaps a dozen of tallow candles into the bargain, as warmly-clad travellers have related, with astonishment, of these people. We should then also be able to take the same quantity of brandy or train oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the temperature of the external air and that of our bodies.’

“We often wonder how the Greenlander or Russian can relish train oil; we know perfectly that our own organs of digestion would refuse to receive it; but the cases are very different. In cold countries the air is much condensed, for we are well aware that air expands by heat and contracts by cold. Hence the inhabitant of a cold region receives much more oxygen at each respiration than the inhabitant of a hot country, in which the air is expanded by heat. In a cold country, therefore, more carbon is necessary to combine with the excess of oxygen than in the hot country. As oxygen never escapes from the system, after having entered it, except in union either with carbon or with hydrogen, anything which tends to increase the amount of oxygen inspired will occasion a greater consumption of food. Thus exercise increases the number of our respirations, and consequent supply of oxygen to the system; and the result is that,

after exercise, we consume more food than we should have done had we not received it. The only use of clothes, in the abstract, is to economise food. They assist in retaining the heat of the body, and render less food or fuel necessary for this purpose.

"In herbivorous animals the fuel used in the production of heat consists of sugar, starch, gum, and other ingredients of food which do not contain nitrogen.

"In carnivorous animals, or those which live entirely upon flesh, the heat of their bodies is supported by the combustion of their own tissues. Hence it is that we see the hyena, pent up in the cage of a menagerie, move continually from one side of the den to the other. These movements do not arise from an impatience of confinement, but from the necessity of sustaining the temperature of its body by the combustion of its tissues. Its continued motions accelerate the waste of its body, and introduce more oxygen into its system by the increased rapidity of its respirations."

What, then, are the practical ill results which arise from an inattention to these facts?—the want of a supply of food adequate to the increased demands of the animals when the temperature of the atmosphere in which it is placed is low, or the warmth of the body diminished by exposure to cold currents of air, or by the effects of the evaporation from a wet skin? Mr. Finlay Dun, an eminent veterinary surgeon, has gone over all these bad results of carelessness with his usual ability. He told the stockowner—in a recent volume of the "Transactions of the Highland Society," when speaking of the results of poor diet and a low temperature—truly enough, that animals even before birth are affected by insufficient food: insufficient food during pregnancy, besides rendering the young at the time of birth small and weakly, has also the injurious effect of curtailing the provisions necessary for its future sustenance: the milk secreted is small in quantity, or if it be considerable in bulk, is poor in quality; nor will even the most liberal aliment given after the birth of the young one always remedy the evil. Surely, then, it is false economy to put pregnant cows to an over-restricted diet (see also the experiments of Mr. Horsfall, of Burley, in the last volume of the *Journal of the Royal Agricultural Society*). There is no period in the life of an animal in which the effects of insufficient food are more prejudicial than in early years. This is far too often the case with regard to calves. The calf, after a week or ten days, should be liberally supplied with milk, and for six or eight weeks should receive only new milk, from eight to ten pints per day, divided into at least three meals; then skimmed milk may be gradually substituted for a part of the new milk—

milk should, during three or four months, form its principal food; then the calf may be gradually accustomed to other sorts of diet, especially to oil-cake. Calves should be housed at night before the weather becomes cold and inclement, after their first summer's grass. Young cattle are generally placed in sheds or courts, but their feeding often receives too little attention; the result is unthrifty coats, lank limbs, and potbellies; these again, when they are suddenly put upon a more liberal diet, become liable to various casualties, such as purgative, congestive fever, abortion, epilepsy, and various cerebral affections. Then as to exposure to wet: Its most uniform effects are a tendency to diarrhœa and muscular relaxation; there is a marked tendency to anarsaca, and œdematous swellings observed amongst men and animals living in moist localities. Wet weather is apt to induce rheumatic enlargements of the joints, foul in the feet, and quarter-ill. In sheep, the ill effects of exposure to rainy weather are still more decided than in neat cattle: in them it produces diarrhœa, affections of the feet, enlargements of the joints, scab, braxy, and rot.

Exposure to a moderate amount of cold, and for a limited time, increases the vital energies, and invigorates the organic functions. In excess, it has an exactly opposite effect. It then exercises a sedative or depressing influence, inducing slowness of the circulation, feebleness of the respiratory organs, diminished power of generating heat, coma, and death. These are the symptoms which manifest themselves in severe winters, and are seen in all their stages by shepherds whose pasture grounds are unsheltered, and exposed to piercing cold and scourging winds. Want of shelter exposes animals to sudden and excessive changes of temperature, and to the heat-abstracting influence of cold currents: it necessitates the consumption of a very large allowance of food; and when, as is usually the case with animals badly sheltered, exposure to cold is conjoined with exposure to rain and all kinds of weather, the necessity for an increased supply of food will be still greater. In such circumstances, an unusually large quantity of materials is expended in the maintenance of the animal heat; and if this extra expenditure be not compensated for by an increased quantity of food, the animal necessarily loses weight. Amongst the other diseases produced by exposure to cold, are rheumatism, pulmonary consumption, scrofulous tumours, increased loss of ewes and lambs in the lambing season.

The experience of the owner of live stock will well accord with these medical observations. They all tend in one direction, that of proving that the



more attention we bestow on the *comfort* of the animals committed to our care—the oftener we vary with the seasons their food and the ventilation of their houses—the more profitable will be the food they consume, the better will they repay us for our labour and our capital.

## ARTIFICIAL MANURES, ECONOMY OF FOOD, AND FARM-YARD MANURE.

SIR,—There have been three papers recently published by Dr. Voelcker, the professor of chemistry in the Agricultural College, to which I desire to call the attention of all farmers who may not have had the advantage of a perusal of them. Two of them appeared in the Bath and West of England Agricultural Journal, the one, "On the Agricultural and Commercial Value of Artificial Manures, and on their Adulteration;" the other, "On the Chemistry of Food." These have been published separately. The third, "On the Composition of Farm-yard Manure," appeared in the last number of the Journal of the Royal Agricultural Society.

The paper "On the Agricultural and Commercial Value of Artificial Manures" describes the most important constituents of such manures; the crops to which they are most beneficially applied; the real agricultural value of them, as an indication of the price it may be worth our while to give for them; the adulterations which may prevail; and suggestions for our protection against that iniquity.

The paper "On the Chemistry of Food," a title not very inviting to farmers, and which I should rather have entitled "On the Economy of Food," and that "On Farm-yard Manure," I venture to state, after the perusal of nearly all that has been written on agriculture during the last 30 years, are the most practically useful to the ordinary farmer, if not the most important contributions to agricultural literature, which have appeared within that period. These essays should be in the hands of every farmer, and be carefully studied.

With respect to the paper "On the Chemistry of Food," it is sufficient for the present purpose to state that it explains the principal constituents of the various feeding stuffs used by the farmer, and the different purposes to which these are applicable in the animal economy; hence it teaches us the selection of those which will most effectually accomplish the special object of the feeder at the least cost; whether that object be the feeding of young growing stock, the fattening of the mature in growth, the greatest production of butter or cheese. We are taught how to lay out our money to the greatest advantage—in a word, the economy of food.

The management of farmyard manure would, at first sight, seem a very simple affair, and that view of the matter has probably led to the enormous waste of it up to this day. Science has done good service in pointing out to us the elements of which this manure, in its natural state, is compounded, their relative importance in vegetable nutrition in distinguishing the soluble from the insoluble, and the losses sustained by exposure to the elements.

This essay of Dr. Voelcker's is especially recommended to the farmer's not mere perusal, but attentive study, as a record of facts, accompanied by conclusive evidence, as distinguished from communications of a theoretical character and containing the mere opinions of an individual. I would not impose on the mere agriculturist the labour of investigation, the numerous analyses, and the pages of figures,

the result of many months' severe labour, on which the information given is founded. Only the results which are given necessarily concern them. Those results may be taken as established, the analyses and tables being appended as the evidences on which those results are founded, for the use of those who may be disposed to examine the subject more in detail.

As I fear the Journal of our society is never seen by a very large proportion of the agricultural community, I will state very briefly two or three consequences of the everyday treatment of farmyard manure which will surprise many farmers, and which will, I trust, induce those who have not yet read this highly interesting article, to obtain and study it when published separately, for which the consent of the council of the Society is necessary. There can be no doubt that will readily be given in favour of an essay of such practical utility to every occupier of land.

Dr. Voelcker selected from a heap of fresh-made manure from horses, cows, and pigs, mixed together, three parcels consisting of two cart-loads each. No. 1 was placed in a heap against a wall, but exposed otherwise to the weather. No. 2 was placed under an open shed. No. 3 was spread in an open yard, about the same thickness as it is usually found in farmyards. No. 4 was a heap of well-rotted dung, placed against a wall under the same circumstances as No. 1.

These heaps having been first weighed and analyzed were placed in November, 1854; and were again weighed and analyzed every three months up to Nov. 1855. It will be sufficient for my present purpose to state only the more striking results in the case of the heap No. 3, being the usual mode of treating manure, as developed at the conclusion of the experiment.

The loss in weight of the dry manure, exclusive of water, was 42 per cent. The soluble ash, containing the most valuable saline matters, was reduced one-half in the first six months. The soluble nitrogenous matter had nearly disappeared, leaving only a trace behind of nitrogen. The soluble organic matters were reduced from 41 lbs. to 4 lbs., the insoluble organic matters from 25 to 10 per cent. The soluble mineral matters were reduced from 25 lbs. to 5 lbs. Of the nitrogen 59 per cent. was lost. Of the No. 4 heap of well-rotted dung placed against a wall, and exposed to weather for 12 months, out of 59 lbs. of soluble organic matter present at first, only 11 remained; and from 23 lbs. of soluble mineral matter, only 10 remained. A trace only of the free ammonia in this heap remained at the end of the experiments, and nearly all the ammonia in the form of salts was lost. Dr. Voelcker observes that our farm-yard manure is by far the most valuable of any, as comprising all the elements essential to the successful cultivation of all the crops we produce. In round numbers, two-thirds of the fertilising matters were wasted at the close of the experiment. In fine, the real manuring constituents rapidly diminished, so that a very small proportion of fertilising matter remained.

Dr. Voelcker states that the drainings from dungheap

exposed to rains are actually more valuable than the urine of our animals, as containing a much larger quantity of phosphate of lime.

It is to be hoped we shall see no more of this fine gray running down ditches or permitted to pollute our pools. These experiments show how much truth there was in the observation of the facetious author of the "Chronicles of a

Clay Farm" on seeing a neighbour carting out his long exposed manure: "There goes neighbour Dry-chaff's creaking hearse, conveying away the body from which the soul has departed."

I am, Sir,

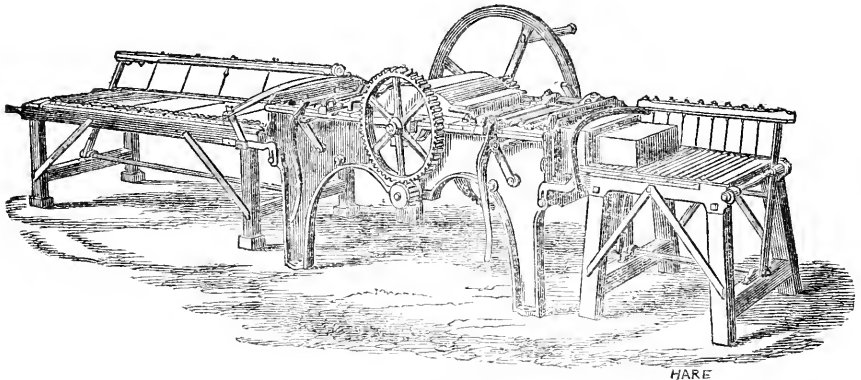
Your obedient servant,

Cirencester, Dec. 26.

CHARLES LAWRENCE.

## BRICK-MAKING MACHINES.—CHELMSFORD MEETING.

### WILLIAMS' BRICK AND TILE MACHINE.



HARE

We believe the statistics of brick and tile machines would show that those of Mr. Williams, of Bedford, have met with more popularity in the brick and tile-yards than many of their rivals. This arises from their simplicity of mechanism, adaptation to the wants of the majority of manufacturers, effectiveness in the production of a superior article, durability, and low price at which they are sold. They are made of various sizes to suit customers, and on several plans. The one to which we now propose confining our observations (an engraving of which accompanies this) is constructed on a new principle, the pistons being driven by an eccentric instead of a rack and pinion; and may be worked either by hand, horse, or steam power.

The engraving represents a two-chambered hand machine, delivering bricks from the right-hand chamber, and draining-pipes from the left. Between the two is the eccentric, with a piston on each side; the one expressing the clay, while the other is returning empty from the die to the opposite end of the chamber. One man feeds them, first the one chamber and then the other; and four boys, two at each end, remove the bricks or pipes, as the case may be, and when driven by steam this staff will turn out 10,000 bricks per day of ten hours, or 24,000 2-inch draining-pipes—or 14,000 of the latter when worked by hand, and a corresponding number of the former.

The principal novelty is the reciprocating traverse-action of the pistons by means of an eccentric differing in construction from those usually converting rotary into rectilinear motion. In this case the eccentric

works like a cam between two friction-rollers in the traverse frame of the pistons, only acting on one friction-roller at one time, the two thus touching each other on but one point, and hence reducing friction to a minimum.

The advantages of this over the rack and pinion are these:—Less liability to breakage from over-driving, and a smoother action to the piston and flow of clay through the dies.

### BURRELL'S MODEL OF A BRICK-KILN.

A good brick-kiln, to burn bricks at all seasons of the year, is very much wanted. The subject is now engaging considerable attention, and we should like to see Mr. Burrell's plan reduced to practice on a larger scale, so as to be able to speak from facts. In the absence of such, the following will give a general idea of it. The kiln consists of two long channels running alongside each other on the ground-floor of a large building, in each of which is a railway for receiving iron waggons loaded with bricks. The one channel is for burning, and the other for cooling. At the end of the former the waggon-loads of unburnt bricks are wheeled, and taken out at the opposite end, where the fire is kindled, burnt, when they enter the other channel for cooling. By the time the waggons are successively pushed up to the fire, the bricks are presumed to have attained a red heat. Over the kiln drying-sheds are erected for consuming all the waste heat, so as to economise fuel, and prepare the bricks for burning.

## A STIFF CLAY FARM.

SIR,—A farm of some 500 acres, all very stiff clay, to be managed! I feel inclined from fellow-feeling to exclaim, Thank heaven, I am not the fortunate occupier! 75 acres of pretty good meadow make the matter a little less serious: 425 acres, though, are still left to trudge through, of this nice retentive raw material. Of course in these progressive times, when clay land is to be turned by mechanical process into turnip and barley soil; when two horses abreast are able to plough the stiffest soil, even if the season is wet; when the old long plough, stigmatized as “the invention of the enemy,” gives way to the PP, LLB, &c., whose wheels never clog, however wet or stiff the ground is; when the clod-crusher can mould the rawest ploughed clay into a beautifully fine tilth for the seed-barley—when all these wonders are realized, then indeed, *ou papier*, the management of clay farms is fit occupation for novice or amateur.

But practice and theory in this, as in many other cases, widely differ. To answer your correspondent M. W.'s questions satisfactorily, it is necessary first to ask, Are these 500 acres of stiff clay to be farmed for profit? *i. e.*, does the occupier wish to farm the land as well as he possibly can, at the least expense? I will take it for granted that he does; that every shilling laid out in its cultivation is expended with a view to a solid return; and that the system adopted must of necessity be a paying one. I take it that the land is, literally, stiff clay; and any observations I make are applicable to this description of land alone.

“Turnips are tried,” M. W. says, “but fail through the attacks of the fly.” This must not be laid to the land alone. If genuine *new* seed is used, and *plenty* of it, with sufficient manure underneath to force the young plants along, I do not think that the fly would injure the crop more on clay than on any other sort of land. That good crops of roots can be grown on clay land, with careful management and in average seasons, is beyond doubt; the question is, Are they grown profitably? To get root crops is comparatively easy; the difficulty lies in consuming them on the land, or carting off without injury to the succeeding crops. That this can be done in some seasons easily enough is not to be denied; but a system must hold good for all seasons.

Suppose we briefly run through the course many adopt in preparing stiff land for crops of roots, say mangolds: Take a wheat-stubble, moderately clean, but with patches of couch, &c., in places; then with forks, immediately the wheat is carried, set to work and get up every particle of couch visible, and carry it off. If yard manure is used, it should be carted on while the ground is dry. The ploughs then follow, at as great depth as can be safely reached. The land now lies to receive the winter's weather; and with a due proportion of frost a nice friable mould is the result. Any couch or weeds appearing in the spring are removed by hand-labour; and if necessary some implement, such as skim or cultivator, should be used, which leaves the seed-bed as before. Having got a pulverized surface uppermost, mind and keep it so. The seed may now be drilled, and with it a fair quantity of artificial manure, say superphosphate, 4 cwt. If this, with the dressing of yard manure, does not give a crop, there is

something very “rotten in the state of Denmark!” Hoeing, &c., duly executed, and the crop safely stored, its weight and cost of production may be calculated: the amount will perhaps be rather startling; but never mind! you have got your crop of roots, which is a triumph over old neighbour “Stick-in-the-mud,” who thought you a madman for trying such a thing.

Now for the succeeding spring crop; spring wheat, barley, or oats. This harvested, and, together with the stock of seeds valued, a Dr. and Cr. account of the year's operations can be drawn up, and a comparison made between root-growing on clay land, and any other system adopted by yourself or neighbour aforesaid. Mangolds most likely will show a balance on the right side. Swedes and turnips, I fear, will prove wanting. Experience, in many instances, has proved such to be the case; and, speaking from trials made by others as well as by myself, I am of opinion that root-growing to any large extent on a stiff-clay farm is an unprofitable concern, and that beyond say 25 acres to be devoted to mangels, swedes carted off early, or turnips to be cleared off by the end of October, some other system than extensive root-growing must be taken up as the order of the day.

From 500 acres deducting 75 acres meadow and 25 acres for root growing each year, it now remains to cultivate the rest in a way most profitable to the occupier. To attain this object green crops of some sort must be introduced to alternate regularly with the corn grown. A rotation often practised on stiff clays is as follows:—1, wheat; 2, beans or peas, manured; 3, wheat; 4, vetches, manured; 5, wheat; 6, seeds laid down two years: the cropping being so arranged that equal quantities are grown each year. The seeds, if down two years, are spring-grazed the second year, and broken up early in the season; the land has then almost the benefit of summer fallow, and large crops of wheat may be grown in this way. Bare fallow, where absolutely necessary, may be introduced instead of beans or vetches in the course; but this should not occur if proper care is taken, and manual labour with the fork not grudged. A bean brush or stubble may often be partially forked over when foul in places, and great expense saved in after operations. This rotation has been practised with advantage on the poorest of clay lands. Where the quality admits, barley may be substituted after vetches. Oats also would be a change to the land; and the crop of seeds found more likely to stand than if sown with wheat. By varying the description of seeds used, say broad clover one course, and grazing seeds with rye-grass the next, the land is not so liable to become clover-sick as when no change is given.

To stock such a farm, where so little winter-keep excepting hay or clover can be obtained, is a difficult matter. A moderate number of breeding ewes might be kept through winter, and their lambs fed-off before summer. To stock the vetches and seeds feeding sheep must be bought, and corn or oilcake liberally supplied, in order that they may be fit for sale before winter. As regards cow stock, a few cows might be kept and their calves reared; so that if oxen were used on the farm, the teams might be recruited by the steers reared on the land. A large quantity of straw will have to be converted into manure; for this purpose steers should

be bought, and if allowed corn or oilcake with their allowance of chaff and fodder, they will make the manure good, and, although perhaps not quite fit for the butcher, will fetch a good price for grazing purposes. If the soiling system were adopted, and artificial food given through summer, no doubt good beef would be fed, and the excellent manure made would yield a good profit. All stock on such a farm should be regarded as manufacturers of this indispensable article. All stock bought for feeding purposes should be of the best quality; inferior land requires to be stocked with animals that have naturally an aptitude for fattening; these invariably are the well-bred ones. Middling land with middling stock soon tells a queer tale; which many know by heart.

A *sine qua non* on the farm is a good road to all parts: without hard roads on a clay farm a man is entirely beaten. With buildings spouted, and convenient yards with tanks for the liquid manure, Go a-head! must be the word. The hurdles and oilcake will be bound to bring corn; and if it be found that other portions of the land can be made to grow roots, the scale of operations may gradually be extended. But a few acres done well, all strength being concentrated to perform all necessary operations when the weather permits, will be most likely to be attended with profit: at least so thinks your humble servant, who farms with one leg in the stiffest of clays.

Yours obediently, G.

## KENNINGTON AGRICULTURAL AND CHEMICAL COLLEGE.

### LECTURES ON THE GENERAL PHENOMENA OF THE EARTH, HAVING REFERENCE TO THE PRODUCTION AND MAINTENANCE OF ORGANIC LIFE.

BY CHARLES JOHNSON, ESQ., PROFESSOR OF BOTANY GUY'S HOSPITAL.

#### No. X.

The ultimate tendency of all the changes that have taken place upon the earth, and that still succeed each other in apparently endless series, seems to have been a preparation for the maintenance of organic life. We have traced these wonderful and varied phenomena as having existed here during eras immeasurable by human computation, and as manifesting, in the remains of its once active forms, phases at once mysterious and indicative of progress towards that highest state of development of which we ourselves are the present representatives.

A morbid fancy, seeking the revelation of a secret—one perhaps wisely hidden from us in this early stage of man's career, perhaps hereafter to be solved during the anticipated forward movement of the human mind—has sometimes been led to speculate upon the marked succession of grades in animal forms and attributes, elicited by geological research. It would trace the gradual metamorphoses through which the infusorial atom has passed into the complicated frame, instinct with thought and reason. Is the transition possible? Because, if so, the probability that such progressive change has been is not to be despised. But assertion based on speculation is as nought without support from circumstance, from fact; and facts, as hitherto attained, seem adverse to the maintenance of a theory so wild at first sight and yet so plausible. The animal kingdom, fossil as well as recent, displays a series of determinate rising forms; but the metamorphic passages are wanting that would confirm us in the hold idea that the higher has emanated from the lower. The question is an important one in a philosophical point of view, but it rests not upon a more certain foundation than the assumed phasis of matter by which the alchemists of a past period sought to transmute the baser metals into gold.

But what is life? What is this mysterious principle, that, to become manifest, requires a modification of the elements never induced without its presence—a modification of them heterogeneous to all the forms of matter but those of organization? What is this organization, and whence does it proceed? Two great systems of existing bodies are included within its limits, and are involved in the query. The animal and vegetable kingdoms stand forth apparently as distinct from each

other in the masses as they are from the third, or mineral kingdom, by which they are mutually supported. Such is, at least, the first impression when our young attention is directed to the observation of natural objects; but when that observation is extended to a comparison between the lower and smaller forms of each, the impression is weakened, and we become undecided as to the line of demarcation that should separate them. Associated by the presence of life, their actual distinctness where that life, and with it organization, commences, is perhaps but ideal; or, if determinate, only to be appreciated by higher powers of comparison than we at present possess.

There was a period in the history of natural science when minuteness and simplicity of organic structure were regarded as synonymous. Human vision has its limits; but now the microscope had lent its powerful aid in extending them, and a change of opinion followed. The instrument, dark and imperfect as were at first its revelations, taught us to regard the organic atom, the insect, and the infusorial existence, invisible without such assistance, as examples of complicated framework and most skilful adaptations of mechanical powers. The moving points—mere glancing specks of light and shade, that flit across the brilliant field of the modern achromatic—may, as the powers of the latter become increased, show structure as varied, intricate as decided, as those which were before regarded the *Ultima Thule* of vitality, the simplest molecules of animated being. Such is the uncertainty of our keenest researches into the domains of minor organization. But one great truth has been rendered palpable: it is the realization of the grand and incontrovertible principle that *like produces like*—the most powerful argument that can be adduced against the advocates of the system which would trace a progressive modification of pre-existent into existing types of organic form.

We cannot pursue living structure to its lowest elementary condition, but we may arrest it at some intervening grade of development, and mark the features it presents there, as well as trace its upward tendency, whether in the growth of the individual or the multiplication of its kind. We may compare one being with another during the progress to maturity, and note how, though mutually divergent from one apparently

common form, the stages to that maturity are few or many, and their results simple or complicated, ever in accordance with the circumstances to be fulfilled, and never surpassing the allotted career of each.

The lowest primary form of organization we reach, in such examination, whether of the individual or of its parts, is a cell: a globular or oval body, membranaceous or solid externally, fluid within. The history of such a body, from its earliest formation to its highest and most complicated development, has been frequently and plausibly discussed by physiologists; indeed, the subject is now so familiar to the philosophical world, that we really seem to understand every phenomenon connected with, not only the growth of such a cell, but even the conditions under which it is launched into existence. Unfortunately for human speculation, these conditions imply others beyond its reach, and the creative power remains a mystery to man. Wherever the formation of a cell is traceable, it is either in association with others, or there are tokens of previous cell-life in the surrounding elements upon which its birth is dependent; and as Frankenstein made his *man*, and Van Helmont his *serpent*, from man and serpent matter, so the modern philosopher is compelled to admit the necessity of organic substance to the production of organic being.

A German naturalist, high in reputation, and in many respects deservedly so, claims especially some precedence as regards the study of cell-development: yet, with all due deference to his name and talent, it is scarcely possible for a reader, unbiassed by theory, to avoid a smile at the prefatory sentence in which this germ of all living being is ushered into notice, viz., "Only in a fluid containing *sugar, gum, and mucus* can cells be formed." Let us pause and inquire into the nature of these three elements, the assemblage of which in the same fluid is so essential to the first step of matter vital existence. Are they not all organic products, proximates only accumulated under the action of the very principle they are here supposed to originate? Are they not remnants of past, administering to the induction of present life? In fine, are they not all combinations of the assumed simple elements, which are incapable of taking place when those elements are only regulated by the powers or properties that restrain matter in the mass, whether in rest or motion, whether constituting the framework of a planetary system or that of a grain of sand? No speculator has ventured to irradiate human knowledge beyond this point, the formation and multiplication of cells; and, unable to penetrate the secret of primordial creation, our purposes will be better fulfilled by reference to known facts than by entangling ourselves in mere theoretical discussion regarding their origin. The formation of a cell may, according to Dr. Schleiden, be effected in two modes; and, though his statement concerning these is open to controversy, and partakes more of the character of affirmation than the detail of observed facts, the obscurity of the subject at present is such as to excuse its adoption as a basis for our proposed review of the general phenomena of organized being. Life, judging from those forms of it to which our familiarity alone extends, can only exist, actively at least, under the influence of fluidity; and therefore, in seeking the embodiment of its lowest germs, we must imagine the presence of such a fluid as that referred to above. In this fluid, whether by fermentation—that is, chemical action—or by some yet inexplicable process into which we need not inquire, the physiologist informs us: first, that the particles of the mucus are drawn together into a more or less rounded body, a cell-kernel, and change the entire surface of that part of the fluid which surrounds them into jelly, a relatively insoluble substance. Thus originates a closed gelatinous vesicle, into which the external fluid penetrates and

distends it, in such a manner that the first-formed rounded body adheres on one side to the inner wall of the vesicle or cell. In this condition, by a repetition of the previous process, it forms a new layer of gelatinous matter on its free side, and thus becomes inclosed in a duplicate of the wall; or, otherwise, it remains free, and is then mostly dissolved, and soon disappears. During the gradual extension of the vesicle, the jelly of the wall becomes consolidated in most instances into cell-membrane, and thus the formation of the cell is completed. Under the second mode of cell formation, the collective contents of a cell become divided into two or more parts, and around each part there is immediately formed a tender gelatinous membrane. In this way many cells are formed, which fill up the cell in which they originated.

Now, this statement, regarded in the aggregate, is not much at variance with circumstances actually traceable by microscopical observation during the growth of certain vegetable and animal bodies. Its grand defect consists in the inability of the author to soar beyond the range of human intellect, and explain the law under which organic structure originates. We have, however, the *cell*, the germ of all living substances, before us, and may trace hence the gradual complication of the frames which it composes; and, what is of more importance to us here, we have the admitted fact that, to form this cell, the results of a previous organization are essential—a fact accordant with the past history of our globe, and that successional introduction of higher forms upon its surface which constitutes the most important feature exposed by geological research, more especially the long-continued series of marine productions, merging gradually through the amphibious reptiles into the warm-blooded inhabitants of the land, each series fulfilling its appointed preparation for the existence of a new creation. The earliest groupings of that grand and ever-changing panorama of life we are unable to trace; their forms were probably too minute and perishable to have left perceptible remnants. In marine life, we know not which of the two kingdoms had precedence: the lowest frames of both, gelatinous or delicately membranaceous, like their existing counterparts, decomposition would speedily remove after death; but, among the rising grades, the stony case of the animalcules has greater durability than the flimsy fabrics of its parallels of the vegetable race, which, while the latter have been annihilated, has contributed to preserve through millennial periods the proofs of its existence. A similar fate has predominated over their more highly organized successors. The marine plant, however conspicuous and long-lived, a mere mass of half-condensed gelatine, has dissolved and disappeared where the calcareous shell, the horn-like fish scale, and bony skeleton have retained their living form and texture. That marine plants are rare in the fossil state is no argument against the vegetable claim to priority in creation; and this is an important point to establish, in studying the relations of the two kingdoms of animated nature, as well as their mutual influences upon each other, and conjointly on the economy of mankind.

The amount of vegetation at the bottom of the sea it is not easy to compute any more than the proportion which it bears to the animal inhabitants of its mighty waters; and, although the greater number of the more specious forms of the latter derives subsistence from animal matter, the proportion may not be much at variance with that which exists between vegetable and animal life upon the land, where the latter is exclusively, though in many instances indirectly, supported by feeding upon the former: a circumstance so evident, that it has been long an accepted fact among naturalists that vegetation constitutes the transitional grade between mineral and animal substance. It is true, that among the minutest forms of

aquatic animals: a similar tendency exists to that which is almost universally predominant among the fishes, crabs, and most of the mollusca (shell fishes), to feed upon their smaller and weaker brethren; and witnessing under microscopic enlargement the fierce appetites of most of these mere points in creation, one might be inclined to doubt the vegetable nurture of any. But the forays of the animalcules contained in a drop of water, upon each other, are only repetitions, on a smaller scale, of those which take place among the higher classes of land animals; of which the carnivorous kinds feed not only on their herbivorous associates, but likewise on the weaker members of their own cast: in neither instance does the act preclude the vegetable element, which is only subjected to a transition more or less before its course is ended. In the same manner the food of the atomic beings that—themselves eaten in turn—support the growth and activity of a water-flea, may be traced through successional stages to the minute vegetable productions which float in the water or clothe the sides or muddy bottom of the ditch or stagnant pool; and in admitting the correctness of a remark once made by a whimsical naturalist, that he and his friend had dined on water-fleas from his own fish-pond—as they had been eaten by the gnats, the gnats by the frogs, while the pike they had themselves eaten had swallowed the frogs—we do not interfere with the certain fact that their food had been derived from a vegetable source, any more than if their dinner had consisted of beef and potatoes.

Let us examine a few of the lower orders of the vegetable creation, which, among others, serve, or may serve, as a basis for animal—nay, for human subsistence, however far removed from direct contact with the human frame, or any other they ultimately assist in nourishing. The inquiry respecting the primordial or lowest forms of either of the two organic kingdoms is necessarily involved in some uncertainty, in consequence of the difficulty that exists in distinguishing between them. This will be readily understood when it is considered that the organic tissues of both consist of the same elements, and that both assume one primary form—that of the *cell*. Ever since the study of natural objects began to assume a scientific character, the naturalists of successive periods have laboured to define their limits, but the difficulty of so doing has always been acknowledged. The definition of Linnæus, the greatest generalizer, if not the most acute observer from the time of Aristotle, was long quoted as a masterpiece; admired alike for its conciseness and correct appreciation of properties, by the allotment of which Nature had distinctly severed the three great classes of terrestrial existences: "Stones grow!" (a belief current even at a much later period). "Vegetables grow and live! Animals grow, live, and feel!" As observation extended, and knowledge became less superficial, this dogma of a comparatively ignorant age lost its previous plausibility; the division of the bodies around us into organic, and inorganic or mineral, usurped the old authority, and the "three kingdoms of Nature" remained only as one of the inventions of antiquity. Growth, in its proper acceptation, was no longer a mineral attribute; sensation, not in all instances demonstrative of animal, nor its apparent absence of vegetable life. But while the individuals of the two classes correspond in certain points, a marked difference characterizes those of each on a broad scale; and the desire of separating them by a definition still exists, as a fulfilment necessary to their perfect classification, and to that division of study which has created the botanist and the zoologist. To this end general structural features and physiological and chemical differences are resorted to in turn, yet without avail, leaving the domains of the parties who divide the observation of the organic world between them

open to the alternate claims of either, and a perpetual border warfare. How is this? An elephant and an oak, a sea-anemone and a sunflower, a sea-weed and a coralline, are referred at a glance to their respective classes; why not a fragillaria and a conferva, a protococcus and a palmella? Only that the more complicated the structure, the more decided and multiplied are the features; the more simple, the fewer and more equivocal. The land and the water alike present us grades of organization equally low; but the aquatic forms of such, surrounded by a medium furnishing abundant and continuous nourishment, are the most conspicuously varied; and the collector of marine species especially may trace their diversification, from plants consisting of a single microscopic cell to those of almost woody texture and gigantic length. But examples of the lower grades of structure are so universally distributed as to be everywhere obtainable for observation by those who seek them.

When we have only been accustomed to notice the larger species—to amuse ourselves by gathering at leisure weeds upon the sea-shore, attracted by their beauty or singularity; or when, in addition to this, our eye has dwelt, during an autumnal woodland walk, upon the varied forms and often-brilliant hues of the Agarici, Boleti, and other tribes of fungus, we are likely to entertain but a very confined idea of the extent of these and other vast natural groups belonging to the inferior orders of the vegetable world. A large proportion of their numbers is overlooked, owing to the extreme minuteness of the objects; a still larger, perhaps, owing to the equivocal appearance of the individuals, is liable to be confounded, by an inexperienced observer, with casual depositions of dust, settlements of sand or mud, or regarded only as disintegrated or decomposed fragments of the substance upon which they grow. And yet, while the more remarkable and particular species of these cellular plants are scattered abroad, clothing the rocks with a thousand various hues, enamelling the falling foliage of the woods, or glowing with tints of richest dye amidst the waters of the ocean—all fulfilling some grand office in the vast economy of Nature; others, of less complicated structure, less imposing aspect, but of equal importance in the scale of being, intrude even within our domestic circle, and affect our comfort and convenience, in many instances, unknown and unsuspected. Wherever a moist atmosphere can penetrate, or a drop of water lie for a short time unevaporated, there these vegetable atoms fix, and prepropagate their kind, and often with a rapidity that induces the cursory observer to imagine their appearance the result of spontaneous generation. Such, among others, are the substances termed collectively "mould" and "mildew"—general expressions, in which are included a little myriad of species, and not a few families, of vegetables, whose actual features are known only to a small number of the more ardent labourers in the field of science, and even to them but very imperfectly.

Who, uninformed of the varying habits of these humbler productions of all-enlivening Nature, would ever suspect a vegetable to be present in—nay, sometimes to be the sole cause of—that thin, hazy film, which, accumulating on the glass of our windows, renders an often-renewed cleansing necessary to comfort? Yet a species of fungus—*Byssocladium fenestralis*, or window *byssocladium*—is not at all unfrequent even in the heart of the crowded city. Such species, however, as this, and mould and mildew, are far from being the lowest or meanest of vegetables. We are, it would seem, yet unacquainted with the simplest forms of this class of beings, quite as much so as we are in regard to the animal creation; but many of the known species referred by botanists to the

group called Algæe, or cellular aquatics, appear to our limited faculties to constitute but a slight remove from the point whence vitality first radiates.

We have already spoken of the form of the cell, and the circumstances under which it comes into existence. There is a seeming inclination manifested by some modern writers, especially of the German school, to seek the incipient rise of organization in the operation of the chemical and mechanical laws which disturb and regulate the inorganic atom. Of the varied modifications of this powerful and mysterious agency we know little beyond a few general facts, upon which are based our calculations of cause and effect; and the discoveries required to lessen the wide gulf that appears at present to separate life and matter, are still in abeyance. That such operations fulfil a necessary part of the phenomena of the former, is a circumstance too evident to be contradicted; and the history of cell-formation presents indications of their action. As matter, in its primitive or unorganized state, has a constant tendency so to arrange its particles that each shall occupy the nearest possible point to the centre of the mass, owing to the agency of that power we call or miscall gravitation, it follows that the globular form should be a natural result of its earliest struggle into organic existence, when the vital energy, from whatever source it may originate, is barely sufficient to effect the inconceivable change that takes place. Accordingly, we find the simplest vegetable, and perhaps animal, bodies emulating in this respect a drop of water or any other fluid—single spheroidal bodies, vesicles, or cells, filled with liquid. Imagine, in fact, a minute drop of water, solidified on its outer surface, fluid within; and you have, at the first glance, an image of an organic cell in its simplest state, nearer to truth than imagination, perhaps, dare conceive. But the cell-fluid, as already stated, is not water alone: that element is simply the solvent of principles requisite to the production and nourishment of the living body, necessary to the elaboration of vitality, but of itself inert.

The spheroidal outline is not, however, universally characteristic of the maturing cell, which often assumes during growth an elongated or ovoid form; and sometimes many such cells are connected end to end, constituting thread or hair-like bodies. These productions, to the presence of which the colours of damp ground and stagnant waters are chiefly owing, exhibit, when carefully examined, various gradations in structure, that ascend, by a progressive scale, towards the more imposing and beautiful forms of vegetation exemplified in the sea-weeds, as they are popularly called. Modern botany has much advanced our knowledge of this formerly-neglected, because obscure, portion of the vegetable dominion; or rather, the researches of its votaries, aided by the improvement of the microscope and increased acquaintances with natural science, have removed many of the previous sources of error which tended to enhance the mystery of such minute productions. We have learned to believe them no exceptions to the assertion of the far-seeing naturalist of a less enlightened age—*omne vivum ex ovo*, and to trace their germs of reproduction in many instances, while in others we feel ourselves justified in assuming their existence; the minuteness of the *sporules*, as the germs of cellular plants are technically styled, being such as to render it possible they may be carried up with watery vapour into the atmosphere, mingling even with the clouds, and falling with the condensation of rain, dew, &c.

Among the most remarkable of the minute organic bodies to which these observations refer, the red snow-plant (*Protococcus nivalis*) may be mentioned; an object first brought into general notice on the return of Captain Ross from his Polar expedition in 1819, at which period much discussion was ex-

cited in the philosophical world regarding its nature. He described it as covering the surface of the snow over an extent of many miles, and penetrating in some parts to the depth of 12 feet. Snow similarly tinged had already been observed in other parts of the world, and an organic production of like character was met with a few years after, occurring on the borders of lakes in the island of Lismore, Argyleshire, Scotland, "spreading abundantly over decayed leaves, reeds, &c., at the water's edge, and distributed over the calcareous rocks within the reach of occasional inundation." Dr. Greville, to whom specimens were forwarded, has described and figured them in his "Scottish Cryptogamic Flora," as consisting of a substratum or layer of gelatinous matter varying in thickness; upon the colourless surfaces of which rested a vast number of minute, spherical, brilliant, garnet-coloured bodies, nearly opaque. The colour is due to an indefinite number of granules, which are eventually scattered by the bursting of the parent cells, gradually enlarge, and, bursting in their turn, propagate the species. Each little globular cell may therefore be regarded as an individual organic being, endowed from its birth with a self-maintaining and reproductive power, exercised independently of those around. The apparently confined structure and feeble vital energies characterizing the *Protococcus* have their parallels in numerous other equally minute and equivocal species, that, occupying as it were the verge of life-creation, seem at present to defy all attempts at classification. So far as the subject before us is concerned we have established a starting point: the individual animal or vegetable nature of the existences, clustered around or receding behind it, is an important topic for discussion, small as are the means we possess of determining the question; but the discussion must now be reserved for the following paragraph of our enquiry.

#### CENTRAL FARMERS' CLUB.

The following subjects have been selected for discussion during the present year:—

February 2.—The most judicious Management and Application of Farmyard and Artificial Manures. Proposed by Mr. R. BAKER, Writtle, Chelmsford.

March 2.—The best means of Improving the Cultivation of Poor and Hilly Lands. By Mr. R. SMITH, Emmett's Grange, South Molton, Devon.

April 6.—The most convenient and economical Mode of Stacking and Thrashing Corn. By Mr. W. BENNETT, Cambridge.

May 4.—The Boarding, Lodging, and Maintaining Yearly Agricultural Servants: the best and cheapest mode of doing so. By Mr. J. MARSHALL, Riseholme, Lincoln.

June 1.—The Autumnal Cultivation of Wheat Stubbles; and the subsequent preparation and growth of a Root Crop, especially on stiff, retentive soils. By Mr. R. BOND, Kentwell, Long Melford, Suffolk.

November 2.—That the Improved Education of the Labourer is essential to the present position of the Farmer. By the Rev. C. T. JAMES, Emington, Devon.

December 7.—The Mechanical and Chemical Principles which should properly regulate the practice of Drainage. By Mr. J. C. NESBIT, 39, Kennington-lane, London.

## CROYDON FARMERS' CLUB.

The first meeting of this club for the season was held on Saturday, Jan. 10, at the King's Arms, JONAH CRESSINGHAM, Esq., in the chair.

On the motion of Mr. R. W. FULLER, Mr. Russell, of Sanderstead, and Mr. Chown, deodorizer and worker of the sullage of Croydon, were elected members of the club, Mr. Fuller adding that Mr. Chown was about to erect large works in Croydon.

## DESTRUCTION OF WEEDS.

Mr. WOOD then read the following paper:—"Mr. Chairman and gentlemen,—The necessity or importance of lessening the quantity of the growth of weeds must be of benefit to the agricultural interest, and the necessity of it on a great portion of the land in cultivation is too often met with. I therefore intend this evening to give what I think are a few practical modes from my own experience and observation how weeds may be very much diminished, so as not to injure the crops to the extent they in many instances do. We are all too well aware of the difficulty of keeping crops clean in wet seasons, even at a great expense, but which might be often remedied by beginning with the hoes when the weeds are young; as, if they are allowed to get strong, it is almost impossible to kill or get rid of them, when they often might have been, and at half the expense, if cut up when young and tender. And it is not only the getting rid of the weeds, but the injury to the crops is often very serious, much more than is generally supposed, which I have several times experienced in the weight of crop, as well as of the land getting very foul at the end of the course. There are many ways of getting land into a foul state. It is often done by seed corn having any particular weed in it, such as kidlock and others; that, if only a small quantity is sown and left to seed over the field, how soon the field may be covered with a weed it was free from before, and which cannot again be got rid of without great trouble and expense. I cannot help thinking that weeds are increasing rather than diminishing, and that thistles are much more numerous than they were, and which I believe arises from the plan of successive cropping without clean fallows; and in many cases they gain strength in not cutting them up when the land is in corn. I cannot alter the opinion that I have before expressed in this room, as to the propriety of having a portion of clean fallow on light lands which is so subject to all sorts of weeds, unless it can be all farmed at a very high rate, and which I believe it to be impossible that manure could be produced to do so. I believe it would be found to be right in many ways; first, by giving more time to get rid of all kinds of weeds, as I think there is no other way of getting rid of thistles, and many other such weeds, but by continually cutting them off for some length of time, which time cannot be given if you sow all with turnips. How many times, in my opinion, would the thistles on light lands be nearly all killed, if the land could have another ploughing or two, and be left clear until the spring. And I am still more convinced that too large a portion of land is sown with turnips, as it is now generally acknowledged that land gets turnip sick as well as clover sick if sown too often. And where a whole fallow would be useful, how often could you let your ploughs go into a fallow

that has to lie so all the winter! when you do much more harm than good in a turnip fallow from being too wet. I do not intend to infer that too many turnips can be grown, but that too many acres may be sown; as a farmer that has a large quantity of land for turnips, by properly working and dressing three-fourths of it for turnips, and leaving the other fourth clear fallow, will oftentimes grow as great a weight of turnips as he would on the whole; and would certainly be more likely to keep his farm cleaner. And how often good turnip lands may be seen with not half a crop of turnips on them—often from the cause of having so many acres to sow that none are really done well! And I think that you would, by putting a small quantity of artificial manure on your clean fallow, grow as much barley, and of a better quality, and better clovers, than you would on your land that was dressed for turnips, and fed off with sheep; and much more likely to be cleaner from weeds. There is another point as regards fallowing, and that is the ploughing land too deep the first time when foul. I have seen several instances lately that convince me that it is wrong, as there has been so much labour bestowed on it, and not got anything like clean after all. I would rather see it rafted or ploughed just to go under the couch, if any, as I see that it is cleaned at so much less expense, and much more effectually. Another bad plan I have seen practised, in fallowing on lands that are subject to seed weeds; that is, by the ploughings being too closely followed, and not giving the seeds of weeds time to vegetate; and many fields would often be cleaner if one ploughing was dispensed with; and where land is very subject to kidlock or many other seed weeds, if time will allow, where Lent corn is to be sown, to harrow the land down, and let it lie until the seeds vegetate, and then, instead of ploughing again, which would bring up more seed, to strike for the crop; and I am convinced from experience that on all light lands more corn and less weeds would be grown. Striking I believe to be much better than drilling; and I think, if more practised, would be found of benefit to light-land farmers. I know many find fault of the time and expense, but I do all with a single horse to a plough; and, if so done, it cannot be a very expensive plan. The effect of striking on the corn crop is, that it seems to enjoy itself better, and to get ahead of the weeds, and not to lose plant so much as in most other modes, or to require quite so much seed. I have before this spoken in favour of transplanting a portion of mangel wurzel and swedes, and have seen nothing to alter my opinion. It may be done with advantage if your land is not clean and ready in proper time to put in the seed. I know from experience that both swedes and mangel wurzel, of the globe sorts, will, if planted out in reasonable time, say the last week in June, have a good chance of success; and that the globe wurzel may be mended in the rows with advantage if done when they are young. I have brought some yellow globe that were transplanted to mend the rows of long red, and they were, I believe, on the average as heavy as the long red that grew from the seed, which speaks in favour of the yellow globe, which I certainly prefer. They were not transplanted until the last week in June, on land that was not used so well as it should have been for wurzel. They were planted about 30in. by



18in., and the land very clean. If the land is not very clean, and much subject to weeds, I should prefer giving them more room between the rows, and less in the row; I think that 3ft. by 16in. is a preferable distance, as there would be the same quantity per acre, viz., 10,390, which, if of the weight of 5lbs. each, would be upwards of 24 tons per acre. I should therefore say, from what I have seen of my own, that by putting the rows three feet apart you can grow as great a weight, and a much better chance to clean your crop from weeds, than when planted closer. And I think it would be well worth the trial to put the rows of swedes 3ft. by 1ft., which would produce 13,600 per acre. I feel no doubt but that you would get nearly or quite as great a weight, with so much better chance of getting rid of weeds, by being able to keep on with the horse-hoe so much longer. I know many object to putting them so far apart, but I feel confident it would be right, and that there would be more corn produced, and less weeds. There is another thing why we should endeavour to keep the weeds under, that is, the increasing value of artificial manures, which must tend to make all other manures of more value; and it must be clear to all that weeds rob the land very much, as well as the growing crop. I hope we may soon see the steam ploughs going about the country as the steam thrashing machines are now, as on many farms there are not enough horses kept to keep the work under as it should be; and we all know that when many things are not done at the time they ought to be done, they are often not done at all. And as some of the sanguine inventors think they shall be able to plough the land at as little or even less cost than the ploughs now in use, it must prove of great benefit to the agricultural interest, as it would enable the farmer to do with less horses, and also to plough his land soon after corn is off, which would do away with many weeds before seeding, and let another crop come away. I feel that I have said many things that some of our best farmers may not approve of; but what I have said on many points does not at all allude to them, but to far too many I fear it does, as it does appear to me that at the present time weeds are certainly one of the greatest enemies the farmer has to contend with, and my object is that as many weeds may be done away with as possible, and that good crops of corn and roots may grow in their places.

Mr. FARLEY: Your observations apply generally to light land?

Mr. WOOD: Well, I don't say much about stiff land.

Mr. FARLEY: The thistles, however, are there, and nothing will get them out but continual ploughing.

Mr. STENNING: And by the turnwrest plough?

Mr. WOOD: Yes.

Mr. STENNING: I think you don't cut them asunder by the turnwrest, as you do by the round plough.

Mr. WOOD, being asked what was the manure used for three splendid specimens of the yellow-globe mangold he had placed on the table, replied that the ground was sown with 8 cwt. of salt, after potatoes, wheat, and oats.

A discussion on salt ensued.

Mr. FARLEY said, it closed the land. As to fallows, the market-gardeners in his neighbourhood never thought of them. Gardening was farming on a small scale; but the gardener considered fallows the greatest of absurdities, and, instead of fallowing, actually raised two crops from the same land. Did they, then, wear out the land by over-cultivation? So far from it, that the longer they cultivated the land, the more it grew.

Mr. WOOD: It will wear out in time.

Mr. FARLEY: Not a bit of it. The longer they kept on, the more it grew.

A MEMBER: You don't mean the same thing.

Mr. FARLEY: You have said very little of the common hoe. The hoe is the only means of keeping weeds down on our light land.

Mr. STENNING said: You could not get the weeds out thoroughly with it.

Mr. FARLEY said, a near neighbour of his sowed his oats on a good piece of land, sowing small seeds at the same time; but the weeds came up in such quantities, that they completely overpowered the clover, and the oats too. He quite agreed as to using the hoe as soon as possible. The sooner turnips were hoed, the better.

Mr. WOOD: Yes—as soon as you can see the rows, the horse-hoe should go in.

Mr. STENNING should differ with Mr. Wood as to following light land the whole year, because they had the whole autumn before to prepare the land for a crop. He would not say, take it all with swedes for early planting; but take some that came later. If they got a green crop, they could leave something behind from sheep. They could put on oilcake, or anything else they pleased.

Mr. WOOD: Well, I know, where there is such a large quantity of turnips, there is often not half a crop got.

Mr. STENNING: Your argument is really this—you are accusing us of farming too much land with too little capital; but, in discussing practical questions, we must assume that we have capital enough to farm with. If a man chooses to take more land than he can manage, I quite agree with you. With heavy land, he might have, out of 60 acres, 40 acres of turnips, and 20 of tares. Where a man was overburdened with land, in proportion to capital, Mr. Wood's advice might be very good; but as a general principle, in the present day, when we can have more manure than we know what to do with, I don't agree with it.

Mr. WOOD said, they could not always get manure.

Mr. STENNING said, he had been offered 500 tons of dung that day; and he knew a man not far from there, that had bought 500 tons of the same individual. The nature of the farm was such, that they would not doubt it required it.

Mr. FARLEY recommended the scarifier immediately after the crop was up. Nothing did more good than doing it in the hot weather. Look at wheat-stubbles: if they were allowed to remain till this time of year, they were all weeds.

Mr. R. W. FULLER had listened with great interest to the conversation, and wished to draw from it a practical inference as to the mode of conducting the business of the club. This, he thought, he should be allowed to do, as the meeting was avowedly of a twofold character. As soon as the subject was introduced, the inclination was, to fall into a conversational discussion. No one got up to go into the whole subject, but each adverted to some branch of it, by which many valuable truths were elicited; and he believed the object would be still further attained, if each gentleman would rise when making his remarks. But, whether that were so or not, he believed more good would be done by conversational meetings than in any other way. As to the question itself, the destruction of weeds, they were all perfectly agreed, was the first thing a man had to do. Before you sowed your corn, you must kill your weeds; and after sowing, whatever annuals came must be got rid of by the horse and hand-hoe, which their forefathers knew nothing about. With reference to leaving

one-fourth of the land fallow, which they usually devoted to turnips, he did not, on light land, see the necessity of it. They might get their land clean without that, and get a green crop nearly as well. Where was the difficulty of doing this, on land you could get at, all the year round? As Mr. Stenning had said, if you had not stock enough for your acreage, leave it to some one that had, and take a less farm. In reality, there was very little land that was not moved four or five times after the crop was sown. Mr. Wood thought sufficient manure could not be got. That was a difficulty he (Mr. Fuller) had not experienced. They had now manures running into a list of names they had not heard at school, in the old times, when they depended on dung and lime. As Mr. Stenning properly remarked, they might have any quantity of a very excellent manure, the value of which was not merely theoretical; for he (Mr. Fuller) had tried it, and could grow turnips with it as well as anything else; and while it could be purchased at the reasonable rate it could, he should continue to use it. He had put two tons of the Croydon sullage manure—for it was that he alluded to—with one qr. bones, on his turnips; and the result had been a most satisfactory crop.

Mr. STENNING: I can speak very highly as to the Croydon sewage manure. It is a fact that my turnips which got the prize had no other.

Mr. FULLER said that he had also been very successful in growing swedes with it, but that was not yet sufficient proof to go to any great extent. To get additional proof, he tried several acres without anything but that manure. Of course they were not so large as where the bones were used, because it cost only 5s. per ton—two tons to the acre. This was in its raw state, and he thought the trial very satisfactory. Mr. Wood had alluded to salt. He had mixed some salt with the manure, and there they were nearly or quite as large as with bones, and at greatly less expense. To return to fallows, the presumption was that they had got capital enough, and if so, they could supply manure enough for their land. He felt particularly grateful to Mr. Wood for bringing the question forward, because they had had great difficulty in persuading any gentleman to come forward, and it was imagined by many they were getting to a low ebb. That was really not the case. He had had great pleasure in proposing three new members for that evening. There was no lack of vitality in a club which had seventy members, plenty of funds, an increasing library, and gentlemen joining them up to that moment. With proper arrangements they might have a capital party, and he hoped most earnestly gentlemen would come forward to give them papers and take part in the discussions.

Mr. CHURCHER fully agreed with Mr. Fuller in the propriety of getting rid of young and annual weeds as soon as possible. As to fallows, they should only fallow for turnips, and not have a whole summer fallow; but where they had heavy land, he would fallow on to October, particularly where it was thistley land. When they ploughed them up late in autumn, they got rid of them a great deal better than in July. If they ploughed the thistles up well and deeply directly after harvest, it would check them better than any other way, and then fallow afterwards. He agreed as to "striking" with the ploughs, particularly for wheat. Clover, however, took much better with a clear summer fallow from Midsummer to Michaelmas. As to transplanting, the specimens placed before them by Mr. Wood showed what might be done by a little perseverance.

Mr. FARLEY thought they should be very careful in trans-

planting not to double up the root, but to let it go its full depth.

Mr. WOOD reminded them that he did not advocate fallows against turnips, but only that one-fourth of the land usually given to the latter should be fallowed; and he did so because he believed that, in the majority of cases, they would get as great a weight of roots on the three-fourths as on the whole. He wanted to see the land clean, and he did not see it so in many places where there was plenty of strength.

Mr. STENNING would be very sorry to see out of 60 acres of turnip land 15 lying idle.

Mr. FULLER thought if a man could only manage to clean 30 acres out of 40, he should take a 300 acre farm instead of 400. A man could get manure, he could get horses, and he could cultivate 400 acres as well as 300.

Mr. WOOD said that land got turnip-sick, and the fallow would on an average of years be advantageous in that way. If a man missed his crop once from growing too often, he would lose more in one year than from all his fallows.

Mr. FULLER thought the error was growing too little green crops, and not too much. As to manure, green crops gave stock, and stock gave manure.

Mr. STENNING said the only question Mr. Wood really raised was, had they capital enough?

Mr. WOOD said the land was very often sown with turnips, and had no dressing.

Mr. STENNING thought if they did keep 10 acres out of a 40-acre fallow, they might take tares on it.

Mr. FARLEY thought a fallow was a return to an old exploded system.

Mr. CROWN advised a liberal use of the horse-hoe and other implements, as the more the land was disturbed the greater the amount of ammonia it derived from the atmosphere. Theoretically manure might be supplied to replace anything taken from their land, so that their crops might be grown consecutively; it was for them to carry this out in practice.

Mr. CASTLEDINE bore testimony to the good effects of a crop he had grown last year with manure from the Croydon Works.

Mr. STENNING felt that the gentlemen in the neighbourhood of Croydon would make a great mistake if they did not use it.

Mr. FULLER, in the warmest terms, moved a vote of thanks to Mr. Wood for his very interesting paper.

Carried unanimously.

The CHAIRMAN expressed the obligations of the meeting to Mr. Wood, and traced the character of the discussion it had elicited, which had been most gratifying to them all.

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HOG'S HAIR.—Farmers who slaughter their own hogs generally allow this article to go to waste. In the large butcheries in the cities it is carefully saved for use in the arts, and forms a considerable item in the profits of the business. It would not pay, perhaps, for those who have but a few pigs to kill, to send the hair to a distant market; but still it should not be left to waste. It is a very powerful fertilizer, and if saved and put into the vegetable fodder next spring, it will give a good account of itself. It is particularly valuable for celery trenches, giving a large growth of tender juicy stalks. Save all the waste of the scalding-tubs for the garden.—*American Agriculturist.*

THE DRAINAGE OF THE METROPOLIS.—WHAT SHALL BE DONE WITH THE SEWAGE?

SIR,—There is no single subject that occupies the minds of thinking and reflecting men, of greater importance than the drainage of London, and, therewith connected, the proper disposal of the sewage. Without depreciating the Board of Works, or calling in question their united ability to grapple with this giant project, I am bound to say that the plan proposed by them was open to one insurmountable objection, that, if attempted to be carried out, would be a continued annoyance to thousands, and a disgrace to the engineering ability of the first nation of the world.

I need not here point out the gross injustice and studied insult offered to the inhabitants on the river Thames, by taking the sewage, and emptying its polluted contents into this "highway of nations," at Erith or elsewhere; but to every person floating upon its surface, whether he comes from the sunny skies of Italy, or the frozen steppes of Siberia, each and all would have to float through the slough of filth and pollution, to reach the capital and home of the world. "O dirty London, I smell thee now!" would become the byword of nations. Besides, in time, it would form a complete barrier to navigation; and every inhabitant would fly from its pestilent banks.

The great question which arises is this: Is the sewage of London of value as a commercial commodity? and, if so, can it be turned to a profitable account? I maintain that it is of great national import that this sewage should be made available, and placed at the disposal of the improved agriculturist of the day, as a most valuable and fertilizing agent. The hungry and over-cropped lands of our corn-growing districts require that this manure should be sent back to them in a liquid state, free from any depreciation by any system of deodorization or chemical contrivance. It has been proved from the most undeniable evidence, both in England and agricultural Scotland, that liquid manures are far superior to any other; and chemists have proved, and common sense bears out the fact, that it is in a liquid state that it enters into the composition of a plant. How very important, then, it is that this highly valuable agent should be collected, and sent into our corn-growing districts, to supply and support the annual depreciation occasioned by the constant cropping of such lands!

I shall therefore, without further preface, point out the means by which the whole of the sewage of London can be sent into the country to the extent of ten, twenty, thirty, forty, or fifty miles from the bounds of the metropolis, and that to the great advantage of the vendor, and much more so to the purchaser, of this valuable commodity.

First, I propose to divide the river frontage into several parts, agreeable to the principal sewage outlets—such as the Tower, Fleet Ditch, Ranelagh Sewer, &c.;

at each of those sewage outlets to erect two large reservoirs, each capable of containing the sewage of twelve hours' supply; these reservoirs to form the Thames wall on the front, and to be carried into the bank as far as practicable, the whole to be covered in; machinery and apparatus (not pumps) of sufficient power and quality to raise the liquid manure to the height of 50 feet, as may be required, and from this height to continue its course under ground to the boundaries of London in two or more iron pipes of proportionate dimensions.

Taking the Fleet Ditch as an example, and to carry out the whole of my views, the first object would be to separate the great quantity of water which finds its way into this sewer foreign to sewer water, and which proceed from springs in its course through Clerken-well, Sadlers-well, &c., &c. This water would be made available as a power, separated from the sewage; I allow the latter to find its way into the reservoirs of large dimensions. These reservoirs and machinery (not pumps) could, in this particular case, be placed below Smithfield, and near to the Samaritan Hospital—on the new line of street from Farringdon-street—of power sufficient to raise the sewage to the height of fifty feet. This done, the pipe or pipes of large dimensions would continue *under ground* through Smithfield, Long-lane, Chiswell-street, Finsbury, and on to the boundaries of London; from thence—if two pipes diverging to a distance of one mile apart, and continuing at this parallel distance—twenty miles from London.

Epping Forest is now about to be enclosed, and, being crown lands, and open to improvement, I direct this supply of *aqua impura* to that locality, whose hungry and thirsty soil would devour all that could be put upon it for years to come, and raise its acreage value from 20s. to 100s. per acre; continuing the pipes in the most approved direction to an extent of 20 miles, I make them available, with short *branches and hose*, to irrigate an area equal to 25,600 acres.

I now propose to show the probable cost, and the returns likely to be made, from this one portion or outlet of London sewage now under consideration.

OUTLAY ON THE FLEET-DITCH SEWER IN CONVEYING CONTENTS OF SAME TO THE EXTENT OF FROM ONE TO TWENTY MILES FROM THE BOUNDARIES OF LONDON.

	£	s.	d.
To separating the springs and other waters from the sewage water .....	5,000	0	0
Building two large reservoirs and covering same, for the reception of sewage, and building thereon engine house, and other sheds, with all necessary sluices, pipes, &c.	15,000	0	0
Purchase and erection of engines and machinery for raising the sewage to the height of 60 ft. in a liquid state .....	15,000	0	0
Purchase of land, and sundry preliminary expenses .....	10,000	0	0
Laying down two iron pipes of proper dimensions, capable of conveying the sewage to the distance of 20 miles from the boundary of the metropolis .....	200,000	0	0
Hose and Taps and implements for distributing liquid manure over an area of 25,600 acres, being 20 miles by 2 miles .....	5,000	0	0
Total outlay..	£250,000	0	0

## ANNUAL EXPENDITURE.

	£	s.	d.
Annual payment on outlay, at 4 per cent. interest, £250,000.....	10,000	0	0
Annual sum to repay the outlay in 30 years	8,333	0	0
Management and office expenses, rates and taxes, &c. ....	5,000	0	0
Working expenses of engines, labour and repairs, wear and tear, &c.....	4,000	0	0
Collection and purchase of street manures, sweepings, lime, soot, manures from slaughter houses, garbage from flesh markets, fish, cowsheds, stables, mud deposit of Thames, &c. ....	3,500	0	0
Distribution of manures on lands by hose and pipes and manual labour, manufacturing manures for districts beyond the pipe supply	5,000	0	0
<b>Total annual expenditure..</b>	<b>£35,833</b>	<b>0</b>	<b>0</b>

## ANNUAL INCOME,

	£	s.	d.
Derivable from the manuring of 25,600 acres of land (being a length of 20 miles by a breadth of 2 miles), at £3 per acre .....	76,800	0	0
Sale of manures beyond the line and district of pipe supply.....	2,000	0	0
<b>Total income .....</b>	<b>£78,800</b>	<b>0</b>	<b>0</b>
<b>Annual expenditure.....</b>	<b>35,833</b>	<b>0</b>	<b>0</b>
<b>Annual profit .....</b>	<b>42,967</b>	<b>0</b>	<b>0</b>

Taking these figures as an approximation to what may be expected to be derived from this one outlet of London sewage, an annual profit is obtained of £42,967, and the land increased in value to the extent of at least £2 per acre, or £51,200 per annum; making a total benefit to both parties of £93,368.

Shall we, then, in the face of such facts, continue to waste this great and fertilizing agent in the waters of the Thames or the German ocean? In addition to all this benefit, we shall provide a cheaper means of transport and a sure sale for our street sweepings, manures from slaughter-houses, knackers' yards, garbage from Smithfield and other markets, cow-sheds, stables, fish markets, vegetables, and breweries; and I look forward to the day when we shall send by the same means of transport the *pollutions of ages*, now lying stinking and infesting the banks of the Thames at low water, and which only wants this easy means to make it a fertilizing and valuable commodity on the lands of our corn-producing districts of the home counties; and its removal would add so much to the health, so much to the pleasure, and so much to the honour of the metropolitan population and its rulers.

It is related of a Norfolk farmer, who visited the Great Exhibition of 1851, that of all the splendid sights he saw, he really longed for but one thing, and that was "a great heap of muck" near the Eastern Counties Railway. We need not go farther than *Tiptree Heath*, in Essex, to witness the beneficial effects of this article in a *liquid state*, and at the same time its dispersion upon lands by means of *pipe and hose at all times available*, either at *seed time* or when the crop is growing. Is it possible, then, that the rulers of our country will, in defiance of all the agricultural statistics in favour of *liquid manures*, be so blind as to allow this great amount of valuable matter to be lost, and become a nuisance, when, by its proper application by *this proper means*, it would become a source of wealth and prosperity to thousands? Is it possible that the *eminent engineers* called upon to *devise means* for its transport from London have heard the good old English proverb, "Waste not, want not"?

I am, sir, your obedient servant,

London, Jan. 22.

GEORGE PRATT.

## THE GREAT CHANGES IN AGRICULTURE DURING THE LAST SEVENTY YEARS.

SIR,—I am now in my seventieth year, and beg to say that I have lived to see vast changes and improvements in agriculture; nay, I have seen the best old farmers beat by young farmers more scientific, with equal vigour, ability, perseverance, and industry. It is plain that *agricultural chemistry*, which has long been delayed, long checked and obstructed by deeply-rooted prejudice, has nevertheless set in, and now bids fair to enlighten and profit the British farmers and their landlords.

In the early part of my life the long-horn or Bakewell cattle stood pre-eminent. As a proof, in the days of Bakewell, Fowler of Rollright, Prinsept, Astley, and others of high fame, Mr. Bakewell let out a long-horned bull, for four months only, at 152 guineas: and I have read in the old "Farmer's Magazines," that in 1794 the Marquis of Donegal fed a long-horned steer, four years old, bred by Mr. Prinsept, that weighed 141 stone, of 14 lbs. to the stone; and in another old "Farmer's Magazine" is stated that a five-year-old long-horned ox, of Mr. Prinsept's breed, weighed 165 st. 5 lbs., of 14 lbs. to the stone, tallow upwards of 20 st. of 14 lbs., hide 177 lbs. Now, the long-horned cattle, once so famous and gigantic in weight—their pre-eminency was of a short duration; they are now dwindled away and are merely shadows to what they were, and are now looked upon as a by-gone breed. What has become of the substance, and is it lost through affinity, or how is it lost?

When the long-horns began to be upon the wane, the far-famed Hereford cattle made their appearance, and stood pre-eminent for years at the Christmas Show in Goswell-street and in Smithfield. Mr. Westcar obtained many prizes for Hereford oxen shown against the best of all kinds of cattle. The North Devons in Mr. Westcar's day were smaller than the Herefords, but considered second to none but the Highland Scots in the quality of flesh.

I have lived to read in the "Farmer's Magazine" of April last, that the high-famed Durham bull, Master Butterfly, was sold for 1,200 guineas to go into a far distant clime.

In the beginning of my time the Bakewell or Leicester sheep stood pre-eminent. In 1789 Mr. Bakewell made equal to 1,200 guineas of a ram in one season; two gentlemen sent 80 ewes at 10 guineas each to the said ram, and reckoning his own ewes at the same price, he was worth 1,200 gs. to Mr. B., because he was offered ewes at 10 guineas to the full amount. Since Mr. Bakewell's time, Mr. Buckley let a Leicester ram for the season at 1,000 guineas—the said ram was used by Mr. Dudding, of Saxby, near Lincoln. Nay, I have lived to see the Duke of Richmond and the high-famed Mr. Jonas Webb show Southdown sheep in the pure Bakewell barrel form, which was said by many to be impossible, unless alloyed with the Bakewell blood; and for years I have observed the Cotswold gigantic sheep imitating the Bakewell cast or mould. And in Lincolnshire I have seen the Bakewell frame with a heavy Lincolnshire coat of wool on their backs, which is very hard to obtain and to keep when obtained.

In my life I have seen land on Lincoln Heath under tenant-right improved 1,200 per cent. per annum. Some of Mr. Chaplain's estates, for instance, let for years as rabbit warrens at 2s. 6d. per acre, now let at 30s. per acre.

I can see plainly that a great revolution in agriculture is about taking place or has taken place; and the *Mark Lane Express* will prove what I say by only looking at the scientific implements in husbandry, which strike thousands with admiration and amazement to see the wonderful progress and vast change in a few years.

SAMUEL ARNSBY.

13, Norfolk-street, Hyde Park, London, Jan. 12.

## RISE AND PROGRESS OF THE INDUSTRIAL RESOURCES OF THE UNITED STATES.

## No. V.

When the War of Independence had been brought to a triumphant termination, the enterprising citizens of the Republic, eager to utilise the undeveloped resources of the West, as yet uninhabited, meditated a system of canalization by which they could reach the unexplored territory. Washington projected a canal which was to stretch to the West by ascending the Potomac; but the enterprise was premature both capital and engineering skill being wanting. Nothing more was done with this project than the construction of some sluices at the little and great falls of the river. At the same period the Pennsylvanians uselessly spent considerable sums in vain attempts to canalise the Schuylkill and connect it with the Susquehanna. In a word, the works undertaken at that juncture and during the first fifteen years of the nineteenth century, were barren of practical results, if we except the Middlesex canal, which, starting from Boston, after a course of some dozen leagues, joined the Merrimack above Lowell.

At the close of the war against England in 1812, the United States had neither useful canals nor good roads. The sea, the large bays, and the mighty rivers which flowed into them, were the only channels of industrial communication and transport, and these the British fleets easily blockaded. Thus their commerce was crushed, and bankruptcy, like the exterminating angel, smote almost every family. But the Americans were taught wisdom in the school of adversity; and, as superior men always appear in nations where liberty exists, there arose a regenerator whose name will ever be honoured in the history of the United States. It was De Witt Clinton, who recommended the construction of the Erie canal, connecting the lake of that name with the city of New York. He met with serious opposition on account of the vastness of the undertaking, and President Madison expressed his conviction that it could not be accomplished even with all the united treasures of the federation. The population of the State of New York did not then exceed 1,300,000 souls, but they had the spirit to commence a work extending to 146½ leagues; in eight years, that is in the year 1825, it was completed, at a cost of £1,875,000 sterling. The success which attended this enterprise led to the gradual canalisation of the whole country, and opened up sources of riches till then deemed fabulous. In due time railways followed, bringing all the great centres of trade into juxtaposition. Up to the end of 1855 the number of miles of railway in the United States was 23,242, and the cost of construction has averaged £7,100 per mile. In the United Kingdom of Great Britain and Ireland there were at the same date only 8,334 miles, reckoning 3,076 miles of double track at 6.152 miles, and the average cost has been £36,000 per mile. In 1844 Congress made a liberal grant to establish the first telegraph line, which ran from Washington to Baltimore; and before seven years had elapsed, the Committee on Post-offices and Post-roads presented to the Senate, in 1851, their report on the route which they had selected for a gigantic line of telegraphs, nearly 2,500 miles in length, connecting San Francisco in California with Natchez on the Mississippi, and thence with the vast network of lines that already covered the Atlantic States. The cost of these lines averaged about £35 per mile. In the statistical work of Messrs. Whitworth and Wallis, compiled from official reports, it appears

that the aggregate length of the telegraph lines of the United States exceeded, in 1852, 15,000 miles; but they have been considerably increased since that date. We learn from the same work that the most distant points connected by electric telegraph are Quebec and New Orleans, which are 3,000 miles apart, while the network of lines extended westerly as far as Missouri, more than 500 towns and villages being provided with stations. There are two separate lines connecting New York and New Orleans, one running along the sea-board, the other by way of the Mississippi, each about 2,000 miles long. Messages have been transmitted from New York to New Orleans, and answers received in three hours, though they had necessarily to be written several times in the course of transmission. When the contemplated lines connecting California with the Atlantic and Newfoundland with the main continent are completed, San Francisco will be in communication with St. John's, Newfoundland, which is distant from Galway, in Ireland, only five days of steam navigation. It is, therefore, estimated that intelligence may be conveyed from the Pacific to Europe, and *vice versa*, in about six days.

It has been stated that when the English blockaded the Americans during the war of 1812, all intercourse by sea between the several States was prevented. Among other commodities, the peat of Virginia could not be conveyed to Philadelphia, there being neither roads nor canals. In these circumstances, some manufacturers who were greatly in want of coal, having heard that it was deposited near the sources of the Schuylkill, procured some at great expense; but it would not burn. Mr. J. P. Wetherell told M. Michel Chevalier, the eminent French economist, that he had made use of a hole in a field, now covered with streets, to bury all this apparently worthless anthracite. A person who had bought a portion of it piled it up in a heap near his house as so much lumber, when one night he was awakened by the strong glare of flame and the crackling sound of some substance in a state of ignition; it was the blazing anthracite. This accident led to experiments, and the proper method of treating it was soon discovered. When this coal was first brought forward into notice in Pennsylvania, its imputed value was treated with contempt. It was jeeringly called "black flint," and reviled as no more inflammable than stone; but now it has become one of the industrial staples of the state, and in Philadelphia alone millions of tons are annually consumed. The iron product of Pennsylvania is also an enormous source of wealth, Pittsburgh being its centre. In the census of 1850, twenty one States are returned as producing pig iron, and in nineteen wrought iron is made. In 1850, 377 establishments were engaged in the production of pig iron; of these 180 were in Pennsylvania, 35 in Ohio, and 29 in Virginia. In the manufacture of iron castings, 1,391 establishments were employed, but a considerable increase has taken place since those returns were made. The progress of the coal trade in Pennsylvania has been most remarkable. It commenced in 1812 in a then nameless place, called Centreville, and with only waggons of coal. It was then deemed a total failure. The name of the pioneer of this enterprise deserves to be here recorded. It was George Shocmaker, ranking as a Colonel, but deemed an impostor. The Lehigh coal mines were commenced in 1820 with only a sale of 265 tons, but, in common with all other

enterprises in America, have advanced with magical rapidity. In 1788 the now opulent State of Ohio was an Indian and savage wilderness untrodden by the foot of the white man. In 1800 it contained 43,365 inhabitants. It is now covered with cities, towns, villages, roads, canals, railways, telegraphs, universities, schools, colleges, and highly-cultivated farms, while magnificent steamers float upon its rivers. The valley of the Mississippi, containing 1,300,000 square miles of generally luxuriant soil, which fifty years ago were peopled by only a few thousand inhabitants, now contains perhaps more than six millions of inhabitants; and when this valley shall become to the square mile as populous as the comparatively sterile Massachusetts, it will contain 67,000,000; but if as populous to the square mile as England, it would number 179,000,000 souls. In the past the population of the United States has doubled itself in periods of 23 to 25 years. In 1827, the population of New York was only 170,000; in 1847, it amounted to 500,000; and in 1873, some of the American statisticians compute that it will exceed a million. In 1830, Boston contained 44,000 inhabitants, and in 1847, 120,000; an increase of nearly three to one in seventeen years. The rise of Chicago, at the foot of lake Michigan, appears marvellous. In 1850, its population was 29,000; in 1856, it had increased to 104,000.

There can be no doubt that free institutions have mainly contributed to promote the rapid civilisation of the United States; and among the most important institutions of liberty may be included educational establishments, untrammelled by a censorship or sectarian restrictions. In the multiplication of books we have the best evidence of intellectual advancement, and they are so numerous and cheap as to enable almost every person to possess a small library, which, some centuries ago, none but the wealthy and learned in Europe could command. Throughout the country newspapers abound. In the New England States, according to the census of 1850, there were 421 newspapers; in the Middle States, 876; in the Southern States, 716; and in the Western States, 784. The following table shows the aggregate circulation of the press, as given by the authority just cited:—

	Number.	Circulation.	Copies printed Annually.
Dailies . . . . .	350 ..	750,000 ..	235,000,000
Tri-Weeklies . . .	150 ..	75,000 ..	11,700,000
Semi-Weeklies . .	125 ..	80,000 ..	8,320,000
Weeklies . . . . .	2,000 ..	2,875,000 ..	149,500,000
Semi-Monthlies . .	50 ..	300,000 ..	7,200,000
Monthlies . . . . .	100 ..	900,000 ..	10,800,000
Quarterlies . . . .	25 ..	29,000 ..	80,000
	2,800	5,000,000	422,600,000

Though the United States are striving to become a manufacturing country, perhaps in some cases prematurely, the great and expanding sources of its wealth are mainly derived from agriculture. The total arable land under culture is given in the census of 1850 at 113,032,614 acres, of which 51,700,000 acres were producing breadstuffs. But since 1850 a very large amount of arable land has been brought under cultivation, and those most conversant with the West and its increased and increasing resources, consider that the augmented product of wheat has been at least 50 per cent. since that date, and of other grain from 20 to 25 per cent. Comparing the census returns of 1840 with those of 1850, the aggregate of all kinds of grain in the former period was 615,525,302 bushels, and in the latter period 867,453,967 bushels. On this subject we do not enlarge, as the columns of this Journal always contain every information on American agriculture as soon as it can be transmitted from the States.

Some of the most influential of American statesmen have

advocated the principle of protection in opposition to the principle of free trade, on the broad ground that industry in its cradle cannot compete on equal terms with industry which has attained to the plenitude of its strength; and they have argued that without protection the United States must for an indefinite period remain in a purely agricultural condition. One of the most complete expositions of the American commercial system is contained in a speech delivered by the celebrated Mr. Clay at Raleigh, in North Carolina, on the 29th April, 1814. As the basis of his argument, he contended that "in time of peace the duties on import should be equal to the expenses of an economical government, and that there should be discrimination in the tariff to foster and promote domestic manufactures." He founded this reasoning on the ground, "that a nation should at the earliest period of her history be adequate to the supply of all its own wants from its own internal resources." Mr. Clay predicted "that the Southern States would combine manufacturing with growing cotton; that the day will come, and it is not far distant, when the South will feel an imperative necessity voluntarily to make such a division of labour, considering its vast water power and other facilities for manufacturing, and its possession at home of the choice of the raw material; I believe the day will arrive when the cotton region will become the greatest manufacturing region in the world." He sums up his views in the following terms: "The doctrine of free trade is a concession to foreign powers without an equivalent; not only without an equivalent, but in the face of their high duties, restrictions, and prohibitions applied to American products. Concessions to foreign powers are concessions to our rivals jealous of our growth, and anxious to impede our onward progress. Encouragement to domestic industry is a concession to our fellow-citizens. It is a concession by the whole to the whole; for every part of the country possesses a capacity to manufacture, and every part of the country does more or less manufacture."

These doctrines are still in the ascendant throughout the United States, though since 1814, the date of Mr. Clay's speech, we have opened our ports to American grain. It requires time to uproot prejudice, but no wise man despairs of the ultimate triumph of true over false opinion.

#### No. VI.

It is well known that the industry of the Southern States is executed by slaves, whose numbers are computed at 3,600,000. According to an estimate made in 1856, there were 6,222,418 white inhabitants, of whom the slaveholders and their families did not number more than 1,980,894, or about 32 per cent.; and these held all the fertile lands, the possession of which confers on them a monopoly of wealth and influence. The majority of the whites not having slaves are in a very poor and abject condition. In a paper "On the Domestic Manufactures, South and West," published by Mr. Turner, of Missouri, in 1847, it is stated that the land held by the non-slaveholders in the more southern parts of the slave States is "almost universally so sterile that a scanty subsistence is all that can be derived from its cultivation; and the more fertile soil being in possession of the slaveholders, must ever remain out of the power of those who have none." And he adds that "the acquisition of a respectable position in the scale of wealth appears so difficult that they decline the hopeless pursuit, and many of them settle down into habits of idleness."

Cotton, the great staple of Southern culture, is the main source of Southern opulence. The extension of its culture is very remarkable. In the year 1789, the value of all the

cotton raised in the United States was only 43,285 dollars. In 1800 the yield only amounted to 40,000 bales, worth about 2,500,000 dollars. The crop of 1856 was estimated at 3,300,000 bales, valued at 143,000,000 dollars. In the whole history of agriculture throughout the world, this extraordinary increase is without a parallel. After careful survey, American statisticians have ascertained that in the south-west there are lands yet untouched by plough or spade capable of producing from four to five million bales, and the whole will be needed as manufacturing industry advances. It has been estimated that the capital invested in the culture of cotton in the United States—including land, labour, tools, &c.—amounts to 300,000,000 dol.; and by the census of 1850, this industry was spread over 5,000,000 acres. But that statement does not give the total agricultural wealth represented by slave labour. It appears from the same census that there were in the Southern States 74,031 cotton plantations, 2,661 devoted to sugar, 551 to rice, 15,745 to tobacco, and 8,327 to hemp. For the year ending the 30th June, 1853, the value of exports, the produce of slave labour, was as follows—

	Dollars.
Exports of cotton .....	126,000,000
Tobacco .....	14,717,463
Rice .....	1,717,953
Naval stores .....	2,049,977

On examining the marketable distribution of cotton as raw material, it will be found that Great Britain takes more than one-half. The estimate, founded on carefully compiled *data*, is made up in the following proportions, deduced from the statistics of the crop of 1855—

	Bales.
France took .....	500,000
North of Europe .....	250,000
Other foreign parts .....	225,000
Consumed in United States ....	700,000
	<hr/>
	1,675,000
Great Britain .....	1,300,000
	<hr/>
Total .....	3,475,000

Mr. Burn, of Manchester, in his "Statistics of the Cotton Trade," states that the cotton wool imported into England in 1781 only amounted to 14,603 bales; in 1856 it reached the enormous amount of 1,300,000 bales, a convincing proof of the expanding importance of the trade. Mr. A. Lawrence, when American ambassador at London, forwarded a communication on this subject to Mr. Rives, American ambassador at Paris, in which he shows—quoting from an estimate made by M. P. T. Jackson and Mr. John A. Lowell for the use of the Tariff Convention, held at New York in 1832—that the home consumption of cotton, prior to the Act of 1816, was only 11,000,000 pounds, while the quantity spun in Great Britain in 1816 was 33,000,000 pounds. Mr. Lawrence then comes down to the year 1845, the year in which he made his communication to Mr. Rives. In that year he puts the consumption in England at 560,000,000 pounds, against 176,000,000 in the United States, his object being to prove that the ratio of increase has not been relatively so great in the former as in the latter country. Thus the increase in the United States from 1816 to 1845 extended from 11,000,000 to 176,000,000 pounds in twenty-nine years, being an augmentation of sixteen-fold. The increase in Great Britain during the same period of time was from 33,000,000 to 560,000,000, being an augmentation of less than seven-fold. Hence he infers, as highly probable, that in course of time the United States will surpass Great Britain in the manufacture of cotton; for in

1856 the ratio is 700,000 bales against 1,300,000, so the consumption in Great Britain is less than three-fold the consumption of the United States.

As England takes one-half of the cotton crop of the Southern States, the interests of the two countries are extremely intimate, the manufacturing and agricultural prosperity of each being dependent on the other. This is one of the strongest guarantees against war; and some of the American publicists contend that, in the event of a disruption between the North and the South, England would be compelled to support the latter. This opinion is founded on an inquiry into the sources from which Great Britain has received her supplies of cotton from 1840 to 1855. Confiding ourselves to the latter year as a term of comparison, we have the following results—

	Lbs.
From the United States .....	564,773,440
„ British India .....	102,333,024
„ Brazil .....	20,240,523
„ Egypt .....	26,291,216

To show, in a strong light, how dependent we are for this great staple of our manufactures on the United States, we will take the return for 1851, distinguishing what was obtained from foreign countries and British possessions.

	Lbs.	Lbs.
From the United States .....	596,633,962	
„ Brazil .....	19,339,104	
„ Turkey, Syria, and Egypt..	15,766,325	
„ Other foreign countries....	2,141,617	633,836,009
„ East Indies .....	122,626,976	
„ British West Indies and		
British Guiana .....	446,529	
„ Other British possessions ..	420,236	
	<hr/>	123,493,741

Total of Cotton imported..... 757,379,749

Our dependence on foreigners for the prime staple of our manufactures is thus made apparent. It is true that we might almost indefinitely increase our supplies from British India; but that wise policy, though urged for many years both on the East India Company and the British Government, has never received the attention it deserves: and we have to deal with facts as they exist. In ancient days, India manufactured for Rome, while in its imperial splendour, those exquisite tissues which decorated the beauties of the court of Augustus Caesar. The rarest gifts that Bengal could bestow on its native princes the most beloved, or on its foreign invaders the most dreaded, were the muslins of Dacca, known as "running water" and as "nightly dew," they being, when wet, scarcely distinguishable from either. Cotton abounded in India when the territory now forming the United States was a howling wilderness; and India may again be restored to its ancient state, through railroads leading from the interior to the coast.

The question of slavery is now the leading topic of the day in America, the late Presidential election turning upon that hinge. It has been stated in the first of this series of articles that the horrible system was introduced by the English; and though the colonial legislatures frequently voted its abolition, and requested the King in Council to confirm the vote, it was always refused by his Majesty's advisers. On the 10th December, 1770, King George the Third issued an instruction under his own hand, in the form of an order in Council, commanding the Governor of Virginia, "upon pain of his highest displeasure," to assent to no law by which the importation of slaves should be in any respect prohibited or obstructed. In 1772, Vir-

ginia made a still more earnest protest; and Dr. Franklin, through the Press, called public sympathy to the support of Virginia. Again and again it was pressed on the attention of the British Ministers. "But," says the historian Bancroft, "the Government of that day was less liberal than the tribunals; and while a question respecting a negro from Virginia led the courts of law to an axiom that, as soon as any slave sets his foot on English ground, he becomes free, the King of England stood in the path of humanity, and made himself the pillar of the colonial slave-trade. Wherever in the colonies a disposition was shown for its restraint, his servants were peremptorily ordered to maintain it without abatement. But he blushed to reject the solemn appeal of Virginia personally to himself, and evaded a reply." Let Candour bear these truths in mind, in judging those to whom England bequeathed this sad inheritance.

After the constitution of the United States had been founded, George Washington wrote thus to John F. Mercer: "I never mean, unless some particular circumstance should compel me to it, to possess another slave by purchase, it being among my first wishes to see some plan adopted by which slavery in this country may be abolished by law." Writing to Sir John Sinclair his reasons for the depreciation of southern lands, he said: "Because there are in Pennsylvania laws for the gradual abolition of slavery, which neither Maryland nor Virginia have at present; but nothing is more certain than they must have, and at a period not remote." In his last will, Washington emancipated all his slaves.

Although the North is more populous and more opulent than the South in a high degree, the latter has always maintained political ascendancy. Here are the proofs. Since the foundation of the Federal Government, out of 16 presidents, 11 have been slaveholders; and out of the

remainder, 3 were notoriously elected by southern forbearance, as they were pledged to support the domestic institution. Southern influence has also been conspicuous in filling up the other great offices of state; for, up to 1852, the slaveholders nominated 17 out of 23 judges of the Supreme Court, 14 out of 19 attorneys-general, 61 out of 77 presidents of the Senate, 21 out of 33 speakers of the House of Representatives, and 30 out of 134 foreign ministers. Such returns show that the South has been more active or more earnest, or has displayed more tact or perseverance than the North.

How slavery will terminate, it would be hazardous to predict. Some have proposed to buy their manumission from their present owners; others to pass a law emancipating all born after a certain date, thus allowing the slaves to die out. Mr. Carey, the American economist, propounds the curious doctrine that the evil will cure itself. "With the increase of production," he observes, "they (the slaves) will obtain the control, for their own use, of a larger proportion of the proceeds of their labour; and that proportion will steadily increase, until there will be seen to arise a class of free black men, cultivating for their own use their own land, bought from their old masters, who will find in the price of their land a compensation for the price of the labourer. Ultimately, and at no distant period, those states will be owned and inhabited by a race of free citizens, differing in colour, but similar in rights, and equal in capacity to their fellow-citizens of the North."

Into the probability of the disruption of the Union, we cannot enter. There may be a northern, a southern, and a western federation; and it is difficult to believe, when the whole continent is inhabited, it will remain undivided. But we must not indulge in such speculations, as they would lure us into the uncertain and the problematical.

## THE SUBJECT OF THE ABSORPTION OF AZOTE BY PLANTS.

[TRANSLATED FROM THE FRENCH OF J. A. BARRAL.]

We have already published the curious experiments of Boussingault upon the action of saltpetre on vegetation, a work in which that agriculturist has been pleased to bring forward the importance of our own observations upon the permanence of nitric acid in the pluvial waters. This fact had not been stated before our researches. Some chemists only—whom we have been careful to cite in a complete history, in which we have considered it a duty to do justice to each of our predecessors—had recognised the presence of azotes in the waters of a storm. The results that we have obtained have been recorded in three memoirs, addressed to the Academy of Sciences. The first of these memoirs has alone been printed up to the present time, having been inserted in the 30th volume of the collection of learned foreigners, by order of the Academy, upon the report of a committee composed of Messrs. Boussingault, Dumas, De Gasparin, Reynaud, and Arago reporter.

Besides chlorides, sulphates, and probably phosphates, we have constantly found, in the collection of pluvial waters collected every month of the year at Paris and at Bruney, nitrates, ammoniacs, and organic azoteous mat-

ters. Investigations undertaken in France, Italy, and Germany have verified the generality of the results obtained by us. We have particularly insisted upon two points—namely, ammonia and nitric acid—not because we are of opinion that pluvial waters were the only source from whence plants derive what manure the soil does not give them, but simply because the constant presence of these matters in rain must be regarded as the certain indications of their important position in the great natural phenomena. In this respect, we have only sought to bring our stone to the mountain, the basis of which has been established by our illustrious predecessors, and which has risen by degrees, thanks to the labours of such men as Bergman, De Saussure, Boussingault, Liebig, &c. But in order that our demonstration may be complete, it is necessary to enter into details.

One of our readers not having apprehended why we have connected the action of nitrates in the absorption of azote by plants, where they cross each other in a soil destitute of manure, demands of us some explanations. We shall give them so much the more willingly that, for



some time, the question of the absorption of azote has seemed to lose its clearness, in spite of the care we have taken to put it explicitly; and that, without doubt, because many are occupied with it, and amongst them many who very imperfectly comprehend it.

Every question of science has its point of setting out, the discovery that has originated it. In the memoirs published in 1837 and 1838, M. Boussingault has demonstrated that in a completely sterile soil—watered with pure water, and kept in the open air, but sheltered from the rain—plants have, notwithstanding, fixed a weak quantity of azote in their organization. This fact, quite unexpected at that time, was soon after verified in Holland, Belgium, and Germany. In announcing it, M. Boussingault had acknowledged that the chemical analysis was powerless to determine anything if the azote fixed during vegetation has not been taken from the mass of the atmosphere. In fact, this principle in the gaseous state in the air might have united itself directly on losing its aëriiform state; or, rather, the azote acquired had for its origin either the ammonia contained in the atmosphere in very small proportion, or that dust which is constantly held in suspension by the air, and of which M. Boussingault has said that “its permanence is placed beyond doubt by the sole testimony of the senses, when a ray of sunlight penetrates into a darkened room”; and he adds, that “the imagination may easily paint to itself, but not without a strong feeling of disgust, all the matters which this dust, that we constantly breathe contains, and which Bergman has so well characterized, by naming it *the impurities of the atmosphere.*”

We are of opinion that this dust is azoteous, and that it should act as dung. We find, too, M. Boussingault engaged in determining its action; and in one of his experiments he made cresses vegetate, which fixed a weak portion of azote in an apparatus disposed to exclude it.

Thus, since 1848, the fact of the assimilation of azote being demonstrated, the question presents itself in this way: *The weak proportion of azote assimilated by a plant cultivated in the open air, in a soil devoid of organic azoteous matters—does it proceed from the azote contained in the air, in the gaseous state, or from some other azoteous principles, equally assimilable, and contained in the atmosphere?*

If we were agreed on this fact, we were not so as to the mode of the assimilation. Saussure believed that the fixed azote proceeded both from the atmospheric ammonia and from the ammonia that might be engendered with the gas-azote of the air by means of fermentation—the hydrogen of the organic substance of grain or plants. M. Mülder, of Utrecht, adopted the opinion of Saussure, and sought to corroborate it by experiments, in which he added to the *calcined soil* organic substances not azoteous, the introduction of which had the effect of augmenting the proportion of the azote fixed by the vegetable. We accept the results obtained by M. Mülder; but we cannot help remarking how very delicate and liable to illusion are such experiments, in which organic matters are made to intervene that are supposed not to contain azote even accidentally. It is

thus that the idea has been held—unhappily, in our opinion—of adding amidon to the soil. According to its chemical form, amidon is composed of carbon, hydrogen, and oxygen; but, in fact, it is perhaps impossible to find a particle of that substance which contains even 0.002 of azote. By adding, for instance, 100 grammes of amidon to the soil, we should take to it 0.2, and probably more, of azote, acting like that of dung.

The opinion of Saussure has had the greater extension, in that it has assumed that the non-azoteous particles of vegetables may still determine a production of nitrate (assimilated by the plant) with the azote of the atmosphere. This idea has been spread everywhere in Holland. This is the cause why we have connected the effects of nitre, which are the same as those of ammonia, upon plants, with the question of the assimilation of azote.

The researches of M. Boussingault, which we referred to in this paper, have demonstrated that saltpetre is absorbed *directly*, without the intervention of substances susceptible of the putrid fermentation; and that the azote fixed by the plant subject to the rule of that salt represents precisely the total amount of azote found in the nitrate, the vegetable not taking, under the circumstance, the smallest portion of azote in the atmosphere.

The azote of the nitrates is, therefore, assimilable, as we may otherwise infer from the employment of the saltpetre of Peru in large farming (*la grande culture*); but it was useful to prove the direct absorption of this species of salt, which M. Boussingault has been the first to do. If, after the extension taken of the ideas of Saussure, the non-azoteous parts of plants—the cellulose, the amidon, the oils—are nitrified, we shall understand how the nitre formed will convey the azote of the air into the organization of the vegetable. But it must be acknowledged, this absorption of atmospheric azote, the consequence of a nitrification previously due to vegetable substances, is not yet established upon any given data, but is a simple supposition. Further, in the investigations made three years since by M. Boussingault, we find an experiment which would tend to make us believe that this nitrification is not realized; for seeds of lupins, having lost their germinating faculties, have remained for five months in sand containing alkaline ashes, the humid mixture being constantly exposed to the contact of 100 litres of air, without giving the slightest indication of nitre.

In causing plants to grow in a calcined soil watered with clear water, not in the open air, but it may be in an apparatus in which the atmosphere is confined, or under a bell glass, in which the air is continually renewed, first passing over purified sulphuric acid, to which it gives up the ammonia without being able to derive from it nitrous compounds, we see the vegetable fix carbon, hydrogen, and oxygen, which it first takes up from the air or the water; but it follows, from numerous experiments of M. Boussingault, that the collection obtained under these conditions does not apparently include more azote than was contained in the seed; from whence he has concluded that the gaseous azote of the air is not directly assimilable. And the proof that

the resistance of the gaseous azote of the air to assimilation does not depend on any arrangement either of the apparatus or the medium in which the vegetable exists, is that, without changing anything of the general dispositions, if we add to the soil vegetable mould, dead seeds become a true manure, the plant, in developing itself in a limited atmosphere, but which then rests upon a fertile earth, fixing azote as it does when it grows in a manured earth.

Thus, a seed deposited in a soil with no trace in it of manure, watered with pure water, will produce a plant which, if raised in the open air, may bear flowers, yield seed, and, after two or three months of vegetation the comparative analysis will imply a gain of azote of some milligrammes (we speak of only one plant), without that we can with any certainty see its origin in the gaseous azote of the air. If that azote intervenes, it is when, quitting the state of gas, it enters into one of those combinations formed under influences not yet fully determined. These combinations—ammoniacs or nitrates—are, beyond a doubt, the first origin of the azote of plants and animals, as M. Boussingault has admitted since 1837, when he said: "If we examine what may be the depositary of the azote, we find, leaving out animals, vegetables, or their *débris*, that there is in truth only one, and that depositary is the atmosphere." It is therefore extremely probable that all organic beings, and consequently plants, have borrowed their azote from the atmosphere, as they have borrowed from it their carbon! And relying on the one hand on the periodicity

of the storms in all the intertropical regions, and on the other, upon the fundamental experiment of Cavendish, showing that the electric spark, produced in a humid air, originates nitric acid and ammonia, M. Boussingault arrived at this conclusion:—"That it is an electric force, the thunder, which predisposes the azote of the atmosphere to enter into the composition of living beings."

We see now that the question with which we have been so much occupied is entirely secondary. A fact had been stated; plants, in the absence of manure and fertilizing principles brought by the pluvial waters, appropriate to themselves azote in very small proportions; the question was to specify the origin of it, which, in a general way, we now know to be the atmosphere. Besides the pure azote, does not the atmosphere contain it in several states of combination? In the case of the affirmative, the pluvial waters should contain permanently ammonia, nitrates, and other azoteous substances. This is what we have demonstrated; but that will not prove, and we have never asserted it, that the azote absorbed by plants, irrespective of the soil and manures, comes from that source alone. Everything demonstrates that the azote of the air is subject to transformations before it becomes the food of vegetables. These transformations take the place in a continuous manner. Ages, in accumulating, have thus produced the modern earth, according to the grand philosophic idea, the enunciation of which will be, in future ages, the glory of M. Boussingault.

J. A. BARRAL.

## THE COMMITTEE OF THE BRITISH ASSOCIATION AND THE ADVANCEMENT OF SCIENCE.

We resume the consideration of that part of the report of the Committee of the British Association which treats of the latter part of their second head of inquiry.

It appears from the preponderating weight of the opinions which they elicited from those best qualified to judge, that the diffusion of scientific knowledge would be best promoted by the foundation of professorships in some of our chief provincial towns, which exhibit the greatest interest in the cultivation of science; and that this would at the same time be the most efficient means of encouraging the cultivation of physical science by creating remunerative employment for those who devoted themselves to such studies. The majority of those who were consulted appeared to have considered that this more solid encouragement would have a far greater effect than the granting of honorary distinctions to scientific men. This is another mode in which the Committee consider that the interests of science might be promoted by the Government.

The prosecution, they observe, of some branches of scientific discovery, and the reduction of the results obtained in others, involve expenses which are beyond the unaided resources of most of the cultivators of

science. From various scientific associations, aid of this kind is at present derived to a limited extent; but further aid than these bodies can afford is sometimes needed, and would be more needed in proportion to the extended cultivation of science. Such assistance the Committee think might be afforded under certain conditions, and that at a very trifling expense compared with the benefits which the community derive from the extension of scientific knowledge, even that which appears at first sight to possess the least practical advantage.

The next point considered, is the project which has been mooted of late for collecting all the scientific institutions of the metropolis under one roof. Lord Rosse is quoted in favour of it. He observes, that every well-educated man feels a pleasure in attending scientific meetings; that it is desirable to enlist able men in the cultivation of science, and to induce their attendance at such meetings. Nothing, he contends, would promote this more than the juxtaposition of the different scientific institutions in a convenient building in some central situation, where the business of science might be transacted, and where there would be easy access to the best libraries, and to

that kind of society in which men of science delight. Another argument urged in favour of this arrangement is, that men of science are politicians in a very limited degree, and have very limited means of acting on the Government. They comprise men belonging to different classes of society. Most of the great questions of reform or progress are effected by the pressure of public opinion, urged on by agitation. Scientific men are peculiarly unfitted for that process, and therefore the Government might not unreasonably be asked to lend them a helping hand.

On this subject the late Professor E. Forbes insists on the necessity of science having a local habitation and a name, to enable it to make a permanent impression on the somewhat material mind of John Bull. As a man, he says, without a home—or, if not without a home, without a club—is a doubtful and suspicious character among English householders, so is science a questionable myth in their opinion, whilst without an available habitation. He therefore regards the congregation of the various important scientific societies in a central public building, at the cost of the State, as the first step towards securing for science due and wholesome reverence. On the other hand, the Astronomer Royal considers that the advantages of this juxtaposition have been over-rated; though he admits that, under certain conditions hereafter recommended, the propriety of such a capital of science would be more evident.

The committee remark on the great encouragement which has of late been given to practical science; observing, however, that the genius of this country is so eminently practical, that there is great danger of the less-showy branch being neglected. In that case they add that not only would practical science itself suffer, but this country would lose its position in the scale of nations. They advert to the popular misconception on the subject of scientific research and applied science. It is not uncommon, they say, to hear, and even read, observations in which the practical application of science is lauded at the expense of science itself. Such remarks, however, they add, must be made in ignorance of the extent to which the most abstruse researches have led to useful industrial results of the greatest importance; if not immediately, at any rate after the lapse of time, when they have been submitted to a succession of master-minds. These objectors have forgotten, it is remarked, that the modern art of navigation is an emanation from the purely speculative—and apparently merely curious—inquiry made by the mathematician of Alexandria respecting the properties of three curved lines formed by the intersection of a plane surface and a cone. The steam-engine owes its most important improvement to the researches of Black and others, respecting the nature of heat, rendered available for practical purposes by the genius of Watt. Photography arose from observations on some curious properties of chemical substances when acted upon by light. Those marvellous properties of light called polarisation have led to the invention of an instrument by which submarine rocks have been discovered—to new methods of detecting the properties of chemical liquids—and to

improvements in the art of refining beet-root sugar. The mariner's compass and the chronometer, without which navigation would be in a rude and barbarous state, arose out of observations on the magnetism of iron and the elasticity of steel, and the relative expansion of different metals. The examination of the properties of gases passed through narrow tubes gave birth to the Davy lamp; and other chemical investigations, apparently as barren of practical utility, taught how to protect the sheathing of ships from corrosion. Experiments respecting galvanic action on the leg of a dead frog gave birth to the electric telegraph—electroplating—the power of producing submarine explosions—and to methods of blasting rocks with greater safety.

Among the advantages of geology, the committee only enumerate in their report the aid it affords in avoiding useless expenditure in searching for minerals where they cannot be found, and in pointing out where to seek them. There are others more intimately connected with agriculture, which they do not notice, but which we have often enumerated. Of botany and meteorology, they say that the former ministers to our health; and of the latter, that in addition to its other important applications, it will soon be enlisted in the service of navigation. Agriculture has a direct interest in the last three sciences; from all the others which have been enumerated it has derived, and is deriving, incalculable benefits in common with the other arts.

The last head of inquiry to which the Parliamentary Committee of the British Association directed their attention was this:—What arrangement can be made to give to the whole body of competent men of science a due influence over the determination of practical questions, dependent for their correct solution on an accurate knowledge of scientific principles? This proposition they state elsewhere in another form: How are the proficients in science to make their opinions known and adopted? The inquiry commences with the admission that late events have shown a disposition on the part of Government to give increased encouragement to science. At the same time, regret and surprise are expressed at the rejection of certain applications for aid, which had emanated from scientific societies and individuals, and which deserved a better fate. They account for the rejection of those applications by supposing that the members of the Administration were either unable to ask for the necessary funds, or were wanting in confidence in the judgment of those by whom the requests were made. Admitting the plea of pecuniary difficulty during an expensive war, the Committee suggest a remedy which they thought would relieve the Government from a difficult and invidious duty, and yet give satisfaction to the cultivators of science.

The attention invariably paid by the Government to the Board of Visitors of Greenwich Hospital and the Board of Longitude on scientific questions are adverted to. This the Committee attribute to the fact that the Board of Visitors and the Astronomer Royal possess more of the confidence of the Government, from their permanent and *quasi*-official character,

than can be expected from the governing bodies of self-supporting societies. The influence which similar institutions possess in France with the Government of that country is also adverted to, and traced to their official character. It is therefore suggested whether a board could not be organized, somewhat after the model of those bodies, which should distribute Government grants, and perform for the whole body of science functions similar to those which the two bodies above-mentioned perform for astronomy and navigation, and act as referees in matters of science brought before the Government. Assuming it to be for the interest of the nation, that there should be a scientific body which should acquire and deserve the confidence of the Government, the next question discussed is, What its constitution should be. On this point the Committee quote the late Professor Forbes, Col. Sabine, Admiral Smyth, Sir P. Egerton, and the Astronomer Royal, as to the necessity of some new Board of Science, though there is, as might be expected, some difference of opinion respecting its constitution and functions. Professor Forbes, of whom the Committee remark that he appears to have reflected much and well on the subject, was opposed to anything like an institute, but was in favour of some board, having at once authority and knowledge, for the regulation and disposal of Government grants for scientific expeditions, publication of results, &c.; matters which he considered to be disposed of, at present, in a manner often exhibiting caprice, often parsimony, often extravagance, and sometimes penuriousness. For such objects he proposes an unsalaried Scientific Committee, with an endowed staff, consisting of salaried representatives—each a distinguished man in his peculiar line of research—of the following sciences :

Mathematics,		Zoology,
Physics,		Botany,
Mechanics,		Geology,
Physiology,		Chemistry.

Admiral Smyth was for the establishment of a proper Board of Longitude, organized on clear principles, and armed with powers tantamount to its responsibility; not a board constituted like the last, but a useful institution, composed like the French *Bureau des Longitudes*—a board managed by unequivocally qualified men, both as regards talent and vocation, with regular salaries, and personally responsible for their public proceedings, whether as regards opinions, rewards, or publication.

Sir Philip Egerton pointed out the evils resulting from our present want of system in scientific matters. He complained likewise of the proneness of the Government to give ear, not to propositions having reference to the acquisition and advancement of pure science, but to the application of scientific principles to the improvement of arts and manufactures. This he admits to be an important matter, very properly confided to the Board of Trade, but which ought not to be confounded with the more intellectual process of scientific research. The toil and labour of this latter, he says, are too often to be left to the unaided exertions of

the scientific drudge; and the Government steps in and reaps the benefit. He proposes as a remedy the establishment of a Board of Science, to which all questions of a scientific nature might be referred by the Government for consideration. Certain funds might be placed yearly at the absolute disposal of this board; but he proposes that all recommendations for the application of large sums should require the sanction of the Government.

The Astronomer Royal was for restricting the functions of the board. He would have it institute propositions, and urge them on the Government; but he objected to its acting as a general referee and arbitrator, in all matters connected with science. The Committee give it as their opinion that such a Board should consist of a certain number of persons holding high official situations in the State, more or less connected with science and education, together with the most eminent men in every department of science. Whatever determination may be adopted as to details in the constitution of such board, the Committee express an anxiety that a principle of stability and permanency should have place. They recommend that a certain portion of the members should be appointed for life, as in the case of the Visitors of Greenwich Hospital, but that some provision should be made for the retirement of a sufficient number to insure the ranks being occasionally recruited with rising men. A paid secretary would be necessary; but they do not look to salaries in this board as an encouragement to men of science, but rather to those indirect stimulants which have been before alluded to, arising out of an increased demand for scientific teachers, caused by an increased demand for science itself.

The Committee conclude their report by summing up, in the following propositions, such of the above suggestions as they consider deserving of the serious attention of Government, the Parliament, and the Universities:—

1. That reforms shall take place gradually in the system of any of our universities which do not at present exact a certain proficiency in science as a necessary condition to the obtaining of a degree.

2. That the addition to the number of professors of physical science at the universities shall take place when necessary, but that at all events a redistribution of subjects or other provisions shall be made, for the effectual teaching of the various branches of physical science.

3. The appointment of professors and local teachers in the chief provincial towns.

4. The formation of museums and public libraries in such towns, open to all classes, shall be encouraged and assisted, in the manner aid is now given to instruction in the principles of art.

5. That more encouragement shall be given by fellowships, increased salaries to professors, and other rewards as incentives to the study of physical science.

6. That an alteration shall be made in the present system of bestowing pensions; that some annuities should be granted, of the nature of good-service pen-

sions; and that additional aid should be given to the prosecution, reduction, and publication of scientific researches.

7. That an appropriate building in some central situation in London shall be provided, at the cost of the nation, in which the principal scientific societies shall be located together.

8. That scientific offices shall be placed more nearly on a level, in respect to salary, with such other civil appointments as are objects of ambition with educated men; and that the officers themselves shall be emancipated from all such interference as is calculated to obstruct the due performance of their duties, and that new scientific offices shall be created in some cases, where they are required.

9. That facilities shall be given for the transmission and reception of scientific publications, to and from our colonies and foreign parts.

10. That a Board of Science shall be constituted, composed partly of persons holding offices under the

Crown, and partly of men of the highest eminence in science, which shall have the control and expenditure, of the greater part at least, of the public funds given for its advancement. Such board to originate applications for pecuniary or other aid in science, and generally to perform such functions as are above described, together with such others as Government or the Parliament may think fit to impose upon them.

Such are the recommendations of the Committee of the British Association for the Advancement of Science; and if it be asked how agriculture is interested in them, we reply by referring to the list of sciences in which it was recommended that professors should be appointed in the provinces, and by asking which of them is unconnected with agriculture. Finally, we again remind our readers that the present advanced state of agricultural chemistry, and the present magnitude of the guano trade, and manufacture of artificial manures, originated in a suggestion which emanated from the British Association.

## ORDNANCE CONTOURED MAPS.

One of the subjects which occupied the attention of the Select Committee of the House of Commons on the Ordnance survey of Scotland, to which we formerly referred, was that of contouring or marking on the maps the lines of equal elevation. At the request of the Committee, the process was thus explained by Colonel James—"The datum line is the half-tide level at Liverpool. From that lines of equal elevation have been run round the island to the same point. This is called the primary line of levels. Having this primary line, if it is desired to run a contour line at 50 feet, or any other altitude, we merely go upon the side of any hill till the required altitude is reached. The level is then set up, and we have only to trace on the ground, by means of pickets, the line which the required line of level would run. The advantages of these lines of contours are stated to be, the forming of the most perfect and accurate basis for sketching in the hills, because it at once brings to the eye the areas of the country, and their altitudes. It is extremely useful for the purpose of mapping the geological structure of a district, and particularly for showing the distribution of the superficial deposits, and the dependence of the distribution of soils upon elevations and forms of surface. Its advocates also contend that it is of great utility to the civil engineer, in deciding the proper course for lines of railways, roads, and canals." On this point there appears, however, to be a difference of opinion, as well as on the advantage of a contoured map to the draining engineer. Mr. Vignoles stated, that in laying out lines of railway in Switzerland and Bavaria, he had found them of the greatest use for the preliminary operations, though he admitted that a contoured map would not obviate the necessity of those more minute and accurate levellings which are necessary to fulfil the requirements of the Board of Works, or for estimating

the contents of cuttings and embankments. From the questions put by Mr. Stephenson, who was on the Committee, it appeared that he did not attach much value to them for these purposes. In a hilly country, where the contour lines come close together, the form of the ground is sufficiently marked to enable the engineer to select his line without their aid; and in a more level country, where the contour lines are wide apart, he conceded that they tend rather to confuse the engineer than to assist him.

There was a similar difference of opinion as to the value of contoured maps to the draining engineer. On the one hand Colonel James stated, that having found a great demand for the Ordnance contoured maps of a part of Yorkshire, he applied to the agent for the sale of them to learn who were the purchasers. It appeared that they had been chiefly purchased by Mr. Parkes, who bore testimony, by letter, to the valuable aid he had derived from them in conducting some extensive draining operations. Colonel Dawson, on the other hand, was not favourable to the present system of contouring. His objections are, that the lines have no place on the ground; that it is impossible to discover or trace them afterwards without chain measurements, which must involve a great expense. He would give the preference to positive heights applied at different elevations, along the course of streams, the watershed lines, and lines of drainage. These, combined with the lines of cliff and of the sea-coast, form the natural features of the country; and the elevation of numerous points along these lines he would record on the maps, with reference to natural and permanent marks readily found. From these the draining engineer would be able to construct for himself such contoured maps as his operation might require. The cost of the system as originally adopted was £4 the square

mile. With modifications which have been introduced in consequence of his suggestions, the estimate was now reduced to £3.

On the subject of contouring we confess we incline to the opinion of Colonel Dawson—that of giving the levels of permanent and well-defined points along the water-sheds and lines of drainage, from which landowners may be enabled to construct, at their own expense, accurate and detailed contoured maps of their own estates. Mr. Sopworth, the celebrated mining engineer, carried these views still further. He was opposed to the construction, and publication by the Government, of any maps on a larger scale than that of one inch to the mile. His objection was the length of time which must elapse before the country could be put in possession of a public map of the northern counties sufficiently detailed for mining purposes. For those purposes he considered even the 25-inch scale too small.

Connecting the question of contouring with that of lines of triangulation, which could be performed by none so well as the Government, he proposed that these should be laid down in skeleton, on a much larger scale than that of twenty-five inches to the mile. From these private persons would be able to construct more detailed maps, of estates or parishes. With respect to contoured maps, this witness declared that they would give a very curious and interesting view of the case, and one which he would be very glad to have, as a matter of general interest; but he doubted whether such a map could go sufficiently into detail to be of any practical utility to the mining engineer in forming his water-races or small channels for the conveyance of water along the sides of hills. All he would require would be the system of levels advocated by Colonel Dawson—the altitudes of various well-defined points, such as the milestones on roads and doorills of churches. He further proposed, that the Government place on record, and render available for general use, either by publication or otherwise, the triangulation, with skeleton maps, of certain areas of from one to ten square miles in extent, including objects forty-four yards on each side of the line; that these should be laid down on a plan sufficiently large for any purpose connected with the towns or rural districts, as, for example, forty inches to the mile—a larger scale, be it observed, than that of the proposed cadastral survey. These being straight lines of small width, might be registered so as to admit of easy reference. Instead of being contour maps, these would be contour points, from which land-owners could at their own expense construct such contoured maps as they might require for mining or draining purposes.

This witness strongly complained of the want of an Ordnance map for the northern counties on the scale of one inch to the mile; and it was chiefly from the delay which would be occasioned by the completion of the twenty-five inch map that he objected to the latter. He admitted, however, that the one-inch map must be reduced from a larger one; and, therefore, this objection appears untenable. On the whole, while with this

witness we lament the length of time which must elapse before the country can be in possession of a twenty-five inch map of England, we consider the construction of such a cadastral map to be highly desirable. Neither can we deem the mining interest of sufficient importance to render necessary the construction of maps on a larger scale for their special benefit.

With respect to contouring, we confess ourselves advocates of the plan of Colonel Dawson—of giving the elevations of certain fixed and easily ascertained points along the lines of drainage and water-shed, leaving to individuals the competition of the details for themselves of their properties.

It may be remembered that in former articles we spoke of the facilities with which copies of maps may be multiplied at a cheap rate by the anastatic process. This process was thus explained by Colonel James:—A tracing from the original manuscript map is simply damped and turned over on a sheet of zinc; a sponge, containing very dilute nitric acid, is then passed rapidly over the back. The effect of this is, that the zinc eats or corrodes to a certain extent the whole of the zinc, except those parts protected by the oily nature of the ink; while at the same time the ink itself receives a different character from the action of the acid. By this simple process it is possible to print from the zinc immediately afterward. The multiplication of plates can thus be carried to an unlimited extent in the shortest time, for from any one impression it is possible to make another plate. Thousands, or even millions of copies, if required, might be produced in a day.

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#### INFLUENCE OF THE PRESENT DEMAND FOR PURE DURHAMS ON THE SMITH- FIELD CLUB SHOW.

STR,—Whilst a well-bred Durham bull-calf at eight or nine months old is worth more than a fat Durham ox at five years old, most of the best-bred Durham male calves will be kept as entire animals, and will find their way nearly from pole to pole—nay, into far distant climes; so that it will be a great loss to the owners to castrate a well-bred Durham calf—Master Butterfly, for instance, had he been an ox. The great demand for the best-bred Durhams will, of course, make the best-bred Durham steers and oxen scarce, and far and wide apart. The true old English gentleman, for instance—I mean the far-famed Sir Charles Knightley, Bart.—when he began to save all his best calves for bulls, it forthwith spoiled his Christmas show of oxen in Smithfield; and the pure-bred Durhams are yet in but few hands, and Mr. Strafford's Herd Book will prove my assertion. Therefore, the public may expect to see at the London and Birmingham fat cattle shows less well-bred Durham steers and oxen, and in lieu of them some coarser kind of shorthorns, with little or no Durham blood in them. A Durham is a shorthorn; but a common shorthorn is not a Durham, because the Durham blood takes its origin from the Collings.

SAMUEL ARNESBY.

No. 18, Norfolk-street, Hyde Park, 26th Dec., 1856.

## BAYLDON ON RENTS AND TILLAGES.

The laws which affect the proceedings of agriculture are even now but indefinite and incomplete. Perhaps this is a something of a necessity. At any rate, we still continue, as it were, to legislate in some degree for ourselves. Scarcely expecting, if indeed asking, any grand general enactment at the hands of the Government, we frame a variety of bye-laws to suit our own special circumstances, and several cases. Custom of country holds good accordingly; but then this custom varies considerably; and nothing is more difficult at times than to get at "the rights" of it. The learned judge, here by no means learned at all, has to gather up his law as well as he can while the case is proceeding; to compare the affirmative of the plaintiff with the direct negatur of the defendant, and may-be to test either by the garulous reminiscences of the oldest inhabitant. His great want is something to go on—some precedent and authority from which he may gather with comparative facility and clearness why any such custom was established, and how far it may be equitably enforced.

For some years now we have had one such authority, a work well known as "BAYLDON ON RENTS AND TILLAGES." Amongst the chief recommendations of this book is the fact that it has already gone through some half-dozen editions. We mention this not merely as a proof of its popularity, but rather as an actual essential to the maintenance of its position and the weight of its dicta. A last year's almanac, Bradshaw's Guide of two or three months since, or the *Times* of the day before yesterday, would be no more out of date and value than the original edition of Bayldon would be at this moment. It is a book that must perpetually require revising. Agriculture has undergone many an alteration since Mr. Bayldon first collated his "Art of Valuing." Many a practice then well enough has long since been held obsolete. Many an item that would have passed easily enough in the good old times, comes to be something more than queried now. The nicely-recorded little ploughings and half-ploughings—the almost-endless enumeration of hay and straw, and such like allowances, would, as it is, stand a deal of "taxing." The ingenuity of every one then was called on, to make up as long a bill of costs as possible. We go more for proof in these days; and, as a principle, pay a man proportionately for the improvement he can show that he has accomplished.

Bayldon, on the "Art of Valuing Rents and Tillages," has the good fortune to be in the hands of the Messrs. Longman. In such keeping it is never likely to depreciate in value or importance. The best assurance for this is the new volume now before us. Bayldon has already gone through six editions, in the course of which

the work had been thoroughly revised by Mr. Donaldson. It now appears as a seventh; and with something even more than a further revision. The volume is, indeed, to a great extent, re-written, and that by a gentleman qualified, perhaps, above all others, for such a duty. We should say, with all due deliberation, there scarcely ever was a man who united so happily the experience and sagacity of the valuer with the innate sympathy and feeling for the farmer, as does Mr. Robert Baker of Writtle. If any one would promise to do justice to either side, to owner or occupier, it would be such a man. If any one could claim a right to correct and amend a book of this kind, it would be such a one; and to him have the publishers most judiciously deputed the task. "Bayldon on Rents and Tillages" is now "enlarged and adapted to the present time, by Robert Baker, of Writtle, Essex, land-agent and valuer."

This is, in fact, in many respects a new work. However small an allowance of law we have had comparatively with other classes, the legislature has of late done something for us. There has been, for example, the enfranchisement of the copyholds taken into account; the valuation of property for parochial assessment provided for; and the erection of farm buildings put upon something like equal terms with the requirements of other pursuits. All these Mr. Baker treats on at considerable length, and with proportionate authority. His long and varied experience here, again, have rendered him equally "up" in what might be considered the original intention of the work—the valuation between the in-coming and out-going tenant, or as between the tenant and landlord. In discussing these claims, it is satisfactory to see that, however well he may have been "broke" in the first instance to respect ancient usages and rights, Mr. Baker is now quite prepared to go with the times. In equity these valuations should only secure to a man a fair price for improvements of which the expiration of his term had not allowed him to reap the full benefit. The object should be to keep the capital—no matter whose—in continual employment in the cultivation of the soil; instead of, as was once but too often the case, locking a large proportion of it up, at the commencement of a tenancy, to be returned again at the close without use or interest, like the profitless talent of the scripture parable. There is nothing sounder than the tenant's right when fairly interpreted, and there is nothing has conducted more to develop the resources of the country. On the other hand, there is no custom which has been more abused, nor under the cloak of which so many calls have been made upon the means of the tenant farmers. It must remain chiefly with the land-owners and valuers to see this matter properly adjusted; and in counselling them to do so, we refer them at once for aid and instruction to this new edition

of Bayldon. They may draw the line very nicely from it.

We can only find room here for the following sample of what we speak to, as taken from the opening pages of the work :—

“The development of agriculture has of late obtained a very large share of public attention, the increasing population of the kingdom demands that the utmost efforts should be made to increase the production also; and, as the area is limited, this can only be obtained by increasing the yearly acreable quantity, and which can be effected only by a liberal system of management, aided by a judicious application of capital and skill; and it therefore becomes daily more and more imperative upon landed proprietors to give due encouragement to their tenants, by affording them the utmost security for the investment of their capital, not alone by removing such absurd restrictions in leases that hitherto have existed, but by giving security, by valuation, for unexhausted improvements. This can readily be attained whenever leases are entered into, but in cases of yearly tenancy dependent on the custom of the country alone, no such security can be insured to the tenant; and it therefore becomes necessary to point out a mode which can be readily applied in furtherance

of that object, and which the late reduction in stamp duties tends also equally to facilitate, viz., by abolishing the yearly tenancy altogether, and substituting a lease for a term of one year instead, in which lease the mode of cropping, as well as other stipulations, may be clearly set forth, and the mode of quitting also provided for in every particular, as in a lease for a longer term. In such lease the landlord should undertake for the payment, at quitting, for all permanent improvements, such as draining and manuring, and for inorganic manures, in proportion as, at the determination of the lease, they might be unexpended; anything in such valuation, however, not to extend over a given period, to be therein named. The covenants of such a lease as this—although made for a single year—would continue binding upon both parties as long afterwards as the tenant might continue to occupy, and considerable advantages would be derived by both beyond those which are obtained under ordinary yearly tenancies subject alone to the custom of the district, which in all cases is so undefined, that if no other object was attained beyond that of having a well-defined agreement in place of an undefined custom, this of itself would be sufficient to recommend it—and as regards buildings erected by the tenant to enable him the better to carry on his occupation, justice and common sense point out the necessity of such an agreement as would allow him to remove them at the expiration of his occupation, should the landlord refuse to take them by valuation.”

#### AN OLD SUBJECT WITH A NEW FACE.

The present form of our bastardy laws is a subject that is now arousing considerable inquiry in several quarters. Some of the unions of England are trying to repeal the law totally, and others to modify and amend its working.

It appears that our poor-law from an early date has afforded a premium to profligacy. While that system of allowing relief in aid of wages was destroying the industry and morality of labourers, the bastardy law was holding out encouragement to female unclarity in the way of a money allowance for each bastard, by which arrangement a mother of several bastards was better off than the mother of as many lawful children. The legislation of Elizabeth did not improve the matter, and subsequent provisions have contributed greatly to aggravate the demoralizing influences of our poor-laws. Strange to say, the very last Bastardy Act seems to have passed through Parliament against the opinion of almost every one who had given much attention to, and was competent to form a judgment upon the principle and tendency of the measure. It was said at the time that all the noble lords who were chairmen of boards of guardians were in the minority.

And what is the state of the case now? Why, any woman, even of the most profligate character, can appear before the guardians of the poor, and demand—what they cannot refuse—shelter and food, medical attendance, and nursing. When well, she can leave the house, and return to her bad practices, and is able next year to come before them with the same claim. We wish to know whether guardians of the poor are doing their duty when they allow such a premium to be offered to this species of profligacy. There is a grievous blight shed over the delicacies of any land where the shameless prostitute is invested with a *right* because of the very misdeeds which ought to have hum-

bled and abashed her; when she can plead her own disgrace as the argument for being listened to, and on the strength of it compel the jurisdictions of the country to do homage to her claim; when crime is thus made the passport to legal privilege, and the native unloveliness of vice is somewhat glossed and overborne by the public recognition which has thus been so unwisely extended to it.

Efforts are now being made by the guardians of some districts to bring about a better state of things. Some memorials are being sent to the Board Above, for the purpose of begging that honourable body to put all the punishment on the putative father, some for making the criminal mother the bearer of her own fault, and others for equalizing the effects of their crime upon both; some, for the purposes of facilitating the process of affiliation, beg that boards of guardians may be empowered to sit judicially upon these cases, to subpoena witnesses, &c., and to grant no relief until the woman has confessed to the paternity of her children. We have seen also advertised, in some of our provincial papers, a resolution proposed at a meeting of guardians, which ignores totally the old method of proceeding, and advocates the adoption of quite a different course. The mover of this resolution conceives “that a great good would ensue, and without any violence done to humanity, *were the administrators of the law to be authorized to put a negative on all those demands that have their direct and visible origin in profligacy of character.*”

He goes on to say, “Upon mature consideration, I am convinced that without any outrage to our sympathies, the criminal parties may be safely left to the whole weight of a visitation that is at once the consequence and the corrective of their own transgression. I know not a more pitiable condition than that of a



female who is at once degraded and deserted; but many are the reasons why such cases should be altogether devolved on the secret and unobserved pity which they are so well fitted to inspire. It is a better state of things when, instead of the loud and impudent demand that is sometimes lifted upon such occasions, the sufferer is left to a dependence upon her own kinsfolk and neighbours, and to the strong moral corrective that lies in their very kindness to her. Were it understood that every such case lay beyond the pale of pauper administration, and must depend merely on the liberalities of the benevolent, we do consider that these liberalities would guarantee a subsistence to all concerned; and at the same time, in a more intense popular odium, there would arise a defensive barrier against that licentiousness which the institutions of our country foster and patronize."

So here we have a plain, bold proposition to deny relief from the poor's rates to all those women whose distress has "a direct and visible origin in profligacy of character."

Well, the boldness and originality of the proposition should not, at any rate, condemn it. We like the principle, and are greatly in favour of that appeal to private sympathy.

We are no admirers of our poor-law system. We do in no wise extol the extolled act, the 43rd of Elizabeth, described as "a monument of English feeling and wisdom." That act seems to have been founded upon the distrust of national character. It is simply an attempt to supplement, by law, an apprehended deficiency in the personal domestic and social virtues of Englishmen. Poverty, we are well aware, will always be characteristic of some portion of our population; but *pauperism* is quite another thing: that is an artificial state, *created* by a legal provision for the maintenance of the poor, and need scarce exist at all. But, under the present system, it develops fearfully; and a people, under the imagination that law will provide for them, will spread and multiply beyond the possibility of being upheld at all. This fact is very evident when we compare the history of English with Scottish pauperism. The Scotch stuck to the voluntary system of supporting the necessitous poor, long after the parochial assessment scheme had confirmed pauperism in England, and increased here its annual expense. We read of the population of a Scottish parish upheld in all pauper expenses for the sum of £20 yearly, while in many a parish in England the pauperism of an equal population cost £1,500. By what strenuousness of management, it is asked, can such a marvel be accomplished? The achievement, we reply, is not due to any particular *management*, but purely to the *manageable* nature of the subject, viz., a population whose habits and whose hopes are accommodated to a state of matters where compulsory provision for the poor is unknown.

Dr. Chalmers gives a case in point. The barony of Glasgow is a suburb parish. The history of its pauperism is instructive. Assessment was first resorted to in 1810. Till that date, the annual expenditure of the

parish was £600. In 1817—seven years after the change of system—this annual expenditure was increased to *five times the former sum!* Do you ask why? Simply, then, because that principle of self-reliance which must underlie a nation's greatness was sapped. Pauperism, which was to have emancipated man from his *distress*, has only emancipated him from his *duty*. It discourages the providential habits of the people—the natural kindness of relatives; it absolves the wealthy from all sympathy for the poverty-stricken, and the poor from sympathy for one another. If this is the action of our poor-laws—and who can deny it?—what reason can we have to wonder at the swelled and swelling ranks of pauperism?

In this resolution we recognize a bold and hearty determination to return to first natural principles, to meet those instincts with which we were born.

The framer of the resolution is aware that the epithets "cruel and inhuman" may, by the unthinking, &c., be applied to his design; in reply to which, he says, that "the inhumanity lies in *perpetuating*, not in *correcting* the evil." To some few of the early cases there might attach the appearance of cruelty; but the sufferings of the one would prove an incalculable blessing to the many: "with the national temptation, the great national crime would disappear."

We agree with this; and, furthermore, we consider it certain that the ministrations of charity would prepare and soften the heart of the criminal mother for the reception of the gently-falling rebuke, and would be more likely to reform her than her lodgment in an Union-house, where she jokes, with others like circumstance, over "the accident" that brought her there. Private charity always was sufficient for these cases before it was interfered with by the law, which has both augmented human want, and enfeebled human sympathy. Legal relief is accompanied with no counsel, no rebuke, no good teaching; it quickens not, but deadens, the sensibility of the recipient. The manner in which we scatter thousands of pounds over the population, without imparting one moral influence or aronsing one spark of gratitude, is most alarming.

"But infanticide!" Eh! infanticide; that is a bugbear those do well to raise who continue a system that perpetuates bastardy! Besides, it is clearly begging the question to take for granted that infanticide would follow upon a return to a natural state of things. Might we not just as reasonably insist that bastardy would be diminished, as that infanticide would be augmented? And, viewing the case logically, this is indeed the conclusion to which we should come.

Looking over some poor-law documents lately, we found a copy of the disregarded recommendation of the Commissioners of Inquiry appointed in 1833. As it nearly concerns the question we are at present discussing, we will here give it. It bears the signatures of C. J. London, J. B. Chester (now Primate of England), Sturges Bourne, Edwin Chadwick, &c., &c.; and commences thus:—

"We recommend that the 2nd section of the 18th Eliz. c. iii., and all other acts which punish or charge

the putative father of a bastard, shall, as to all bastards born after the passing of the intended act, be repealed.

"Cases will no doubt occur of much hardship and cruelty; and it will often be regretted that these are not punishable. But the object of the law is not to punish, but to protect; and if the existing law does not prevent, as is too clear, it must not be maintained against its proper design with a view to punishment; still less must it be maintained if it acts as an incentive. It must be remembered, too, that we do not deprive either the woman or her parents of their direct means of redress; she may still bring her action for breach of promise of marriage, &c., and her parents may bring theirs for the loss of their daughter's service.

"One objection, however, may be made to our plan, which deserves an answer, in deference not to its force, but the religious and moral feelings in which it originates. It may be said that throwing upon the woman the expense of maintaining the child will promote infanticide. It appears from Mr. Walcott's report that infanticide, and in one of its worst forms, is promoted by the existing law. But we do not, in fact, believe that we have to choose between the two dangers; we do not believe that infanticide arises from any calculation as to expense. We believe that in no civilized country, and scarcely in any barbarous country, has such a thing ever been heard of, as a mother killing her child in order to save the expense of feeding it."

Of this recommendation Mr. Pashley, Q.C., says—

"I regret that it should have been disregarded, and that our statute book should still be disgraced by provisions directly tending to injure both female virtue and public morals."

Those who allow that profligacy creates the chief burden of pauperism, and that pauperism in its turn creates and perpetuates profligacy, say that a change of system is fraught with difficulty; and they pronounce this word *difficultly* as though one's mouth must be eternally stopped by it. And because a course that bears upon it the signet of right is *difficult* to pursue, this is sufficient reason to some for not pursuing it. Men who walk in the path of truth and humanity are accustomed to the cry, "There's a lion in the way." These lions, however, are only sham ones: truly they have a loud roar, but they have no power to rend asunder. We do not admit that a principle ought to be abandoned because

its re-establishment may present difficulties, and would to a certainty be attended with dangers; the greatest of dangers—the most inexhaustible source of difficulties, is the misunderstanding of the principle. Everything which is in opposition to the nature of man and to the law of God—everything which is contrary to moral order, is more contrary, more prejudicial to external order, than any reformation which should bring men back to truth, even though it should be by means of a most violent tempest.

Now those who talk about the difficulty of arriving at the right to reject all claims presented at the board-room that shall have their direct and visible origin in profligacy of character, are perplexing themselves with the notion of an universal compulsory Act of Parliament. This idea is quite foreign to the design of the framer of the resolution we now discuss. He says expressly—"I do not advise that any universal measure be enacted for this object, but merely that all obstacles to the voluntary adoption of it on the part of parishes may be removed." If a parish desires the benefit of enclosure, application is made to Government for a special act, upon the showing that a large majority of the population concur in the plan. So for the purpose in question, what may be termed a *permissive legislation* might be carried out, under which those parishes that felt disposed could petition for authority to strike out such a line of conduct as is proposed towards this vicious class of females. If parishes were obliged to show a majority of four-fifths of the rate-payers willing to adopt such a course, before permission was granted, this would be, one would imagine, a sufficient guarantee that the experiment would have a fair trial and a successful issue.

A population so pledged would produce wonders on this class of crime. Discreet relief, falling together with reproof and wise counsel, at a time when the heart by reason of affliction is most open to good impressions, would go far towards producing the fruits of repentance and reform, and virtue might yet be regarded by the poor of England as an attire without which no one dare appear in public.

We present these remarks to our readers, upon the several resolutions before us on the subject of the bastardy laws, in the sincere hope that they may be as grain cast upon the waters, which shall be seen after many days.

PRO LEGE ET GREGE.

## THE SELECTION OF JUDGES FOR OUR AGRICULTURAL MEETINGS.

Day by day are we coming to a more distinct classification as to a more becoming recognition of our several breeds of Stock. Without exactly undertaking to assert which is really the best, we now give to almost every variety a fair opportunity of displaying its merits and attractions. We have for some time been gradually approaching to this, but never so directly nor so decisively as during the last Smithfield Show week. The admiring public is to be puzzled no longer, but to go methodically through every class or kind of animal it ever heard of. It is no longer Shorthorn, Hereford, and Devon only; but as equally defined, Sussex,

Welsh, Scotch, and any other high-bred cattle that can prove to a local habitation and a name. All this is very good. We not only encourage our breeders, and enlighten our visitors, but we even ease the duties and lessen the responsibility of our judges. Years back the upright judge went into the yard instructed to say at once which was the best beast there—to pick him out valiantly from all sorts and sizes, thorough-bred or mongrel, no matter which! He owned, perhaps, to some little sympathy with the Durham, or to some slight antipathy to the Devon, and he decreed, and got abused accordingly. Now, however,

he can pronounce on a Shorthorn simply as a Shorthorn, without any of those invidious comparisons which so often ere this have brought him to grief. To be sure there is the Gold Medal still; but then a man who takes the first honours of his school, will always look with some little philosophy on any little "mistake" his friends may fall into.

The labours, then, of our judges are considerably facilitated; while their decisions are likely to be freed from much of that angry discussion which has too often attended the publication of the awards. And yet, strange to say, there never was more difficulty in making out an efficient corps for such duties than there is just at present. Crabbe, who whatever his merits as a poet, always wrote with wondrous truth and fidelity, thus describes the man we are looking out for:—

"He was of those whose skill assigns the prize  
For creatures fed in pens, and stalls, and sties;  
And, who in places where improvers meet  
To fill the land with fatness, had a seat;  
Who plans encourage, and who journals keep,  
And talk with lords about a breed of sheep."

We will not venture to say how many years it is since this was penned; but this we may say, that the lines are far more applicable now than they possibly could have been when originally composed. Where the poet had one or two such models in his eye, we have them in scores and hundreds. He might perhaps have pointed to a Bakewell or an Ellman. We turn at once to the list of the Royal Agricultural Society—some six or seven thousand strong—and "tick off" name after name of men who sit in places where improvers meet, who plans encourage, journals keep, and talk with lords about a breed of sheep, or of horses, or of cattle, or of pigs. The Society, indeed, would seem to have been born to "make" such men; and as, no doubt, to a great extent, it has done. Yet now it has made them it cannot use them. At this moment the Royal Agricultural Society has nothing more trying to contend with than the appointment of its judges. Exhibitors must not be judges: members of the council have something else to do during this busy week; and so we return to Mr. A. and Mr. B., who have very often obliged us before, and will probably be kind enough to oblige us again.

That a certain sort of exclusiveness has had something to do in creating this difficulty, there can be but little question. As with the Smithfield Club, gentlemen have duly gone the round of their duties, and then, like Bloomfield, on his visit to Vauxhall,

"Why, then they go round them again!"

It has been Mr. A. out and Mr. B. in, and Mr. C. re-elected, until at last, should we ever get through our A. B. C., we are fairly at our wit's end. We don't know what to do. We have been preparing no one else for the place, and now that it is vacant we have nobody ready to take it. The only thing, of course, is an advertisement in the papers, which we insert here, duty free:—"Wanted, a few good judges of stock, &c., &c., for the ensuing meeting of the Royal Agricultural Society of England. Apply by letter, or in person, at 12, Hanover-square."

Once more must we ask, do the members generally of the Society know their own rights and privileges? Are they aware, that according to the rules and regulations of their own body, they are directly requested to send in the names of any of their acquaintance whom they feel are competent to assist in any way in the proceedings? Could they tell us the names of a few gentlemen qualified to act as judges at the great national meetings, but who never yet have acted in such a capacity? If, as no doubt very many of them can, let them oblige, not us so much as the Members of Council, and send such names in on their nomination. Never mind if they are yet untried in so large a field. We have been working a little too much by line and rule as it is; and if we want a precedent of any kind here, it is that every man must have a beginning. So far we appear to have been selecting men as judges and stewards simply because they have been judges and stewards before. Let us now extend the classes a little, as we do with the stock. Let it no longer be all Shorthorn, Hereford, and Devon; but let us have grace enough to name a good man for the office, on the very excellent showing, as we take it, that he never held it before. There is precedent even here, if we must have it. One or two of the very best judges ever enlisted—for stock or implements we will not care which—never acted at all until within these last two or three years.

The selection, of course, must rest with the Council; and it is only right they should have something good to select from. However much or little encouraged, so far, it is a duty the members of the Society generally owe to themselves to assist in making this list out. We will not go quite so far as to say that every member reads the *Mark Lane Express*. If he does not, however, there is the more necessity for his being directly invited to appreciate a little more demonstratively the privileges he enjoys. Why, there is not a man amongst us who does not meet, every day of his life, some capital judge of a horse, or a Down, or an ox. The Council of the Society require the services of this gentleman. It may be a gratifying and well-merited distinction to him, and it will be an essential advantage to them. Send up his name, then, by all means. And if you know of another as good, don't hesitate to send his too. It is impossible to have too many to pick from.

We have said that this selection is made by the Council; that is, by as many Members of Council as choose to attend any meeting appointed for that purpose. It is sometimes asserted that a large meeting cannot get through its business anything like so efficiently as some two or three members of it would. But this, on the contrary, is especially the business, if not of a large, of a full meeting of Council. Depute it to the two or three, and you will have the old prejudices and precedents stronger than ever. Go carefully through the list in open Council, and if you want a name here or there, you will be far more likely to get it from the experience of two or three-and-twenty than from two or three only. Let us never forget the united strength of a bundle of sticks.

## THE PROGRESS OF BRITISH AGRICULTURE DURING THE LAST CENTURY.

The progress of agriculture during the last century is an extensive and interesting subject, capable of being viewed under a variety of aspects. In the first place, there is the progress of improvement, which consists in the invention of superior modes of cultivation, and the introduction of superior breeds of live-stock. Secondly, there is the progress of agriculture in the more general diffusion of those improvements over the country; so that we may no longer witness the anomaly of one farm and one parish producing the most luxuriant crops, while its neighbour, under the same conditions of soil and climate, produces only luxuriant crops of weeds. Lastly, there are the effects of these improvements on the condition of the agricultural labourer. This is by far the most important view of the case. It has hitherto received too little attention; it is a subject, however, in favour of which we should not regret to see a suspension of those energies by which the produce of the soil has been so largely increased. It is a subject to which we rejoice to see that attention is now beginning to be directed, as evinced by a recent discussion at the London Farmers' Club, and a paper published by Mr. Chadwick. It is, moreover, a matter to which it is to be hoped the attention of the Royal Agricultural Society will be directed rather more than has hitherto been the case through their otherwise brilliant career. There is a wide and brilliant career of usefulness before them in that direction, if they will but follow it.

The history of agriculture during the past century may be divided into four periods. 1st. From the accession of George III. to the end of the eighteenth century. 2ndly. The period of the wars of the French Revolution. 3rdly. The period of agricultural distress consequent on the peace of 1815, and of vain attempts to keep up prices by fiscal regulations. 4thly. The period of free-trade, during which British agriculture has had to endure unrestricted competition with that of the whole world.

The stimulus to improvement during the first period was the advance of prices consequent on the increase of commerce and manufactures which took place about the commencement of the reign of George III. It was then that from fluctuating between the exportation and importation of corn, England became a permanently importing country. Up to this period East Norfolk was the chief seat of the turnip culture, and stood at the head of British agriculture. This was the epoch of the commencement of improvement in West Norfolk under Coke of Holkham; the epoch of the birth of the Leicesters and shorthorns, under Bakewell and Culling. Then began the rapid enclosure of commons and common-fields throughout England, and the reclaiming of large tracts of moor-land on both sides of the Scottish border. This was the epoch of drilled

turnips and the thrashing-machine in that northern district, which only made their way slowly at a much later period in the south. It was during this period that the consolidation of farms commenced, and that the yeomen-cultivators began to sell their paternal acres in order to become large renting farmers. The poor-rates had begun to increase; but as yet the condition of the rural labourer had but little deteriorated.

The second period of agricultural progress dates from the commencement of the present century. It was a period of great and rapid progress, but based on an insecure foundation. The stimulus to improvement during this portion of our agricultural history was the rapid increase of prices, produced by a variety of causes. These were—the extensive failure of the crops during several years; the impediment caused by the war to the importation of foreign agricultural produce; the waste of war and its lavish expenditure; and lastly, the excessive issues of paper money, and the suspension of cash payments by the Bank of England, producing a depreciation of the currency, but to what extent was, and is yet, a matter of controversy. It was during this period that the ruin of the labouring population was completed; it was during this period that the pernicious custom was established, and reached its climax, of giving parochial relief in aid of insufficient wages: it was then that the rate of wages was fixed in parish vestry, at the sum sufficient only to support a single man, and that labourers with families received an allowance from the poor-box, proportioned to the number of their children. In this way the independent spirit of the English labourer was broken down, and they who had previously considered it a disgrace to receive parochial relief, now learned to regard it as their birthright. There was one part of the country, however, which in a great measure escaped this contamination: that consisted of those northern counties where the hind system prevailed—that is to say, the system of hired householders residing on the farm, and paid the greater portion of their wages in kind. Their wages consisted of a quantity of that grain which formed the ordinary food of the district, sufficient for the support of a family, together with a cottage, a small piece of ground to plant with potatoes and flax, and the keep of a cow during summer and winter. By this mode of payment, though the wages of the labourer remained nominally the same, or fluctuated only with the slight fluctuation which took place in that small portion of his wages reserved in money, occasioned by the demand for labour, the married hind, with a family of the average number, received sufficient for their support under the utmost advance of prices; and if the number of his family was below the average, he had at the year's-end a very respectable sum to take of his employer for that portion of his "conditions," as they

are called, which he had not drawn. One admirable part of this mode of paying wages was, that the hired labourer, or hind, received a quarter's allowance of corn in advance, and was therefore independent of the village-shop, and had no temptation to spend his money at the ale-house.

We come now to the third period in our agricultural history, when the bubble of inflated agricultural prosperity burst with the downfall of the First Napoleon and the return of peace. This was the period of agricultural distress—a period of low prices combined with high rents and poor's rates. It was the period of vain attempts to keep up prices by restrictions on the importation of foreign agricultural produce. This was the period of which it has been said that the surest way to please a farmer was to tell him that he was utterly and irretrievably ruined. The evils of the previous neglect of the rural labourer now began to manifest themselves. The poor's rates, which had increased enormously throughout the whole country, in some districts exceeded the rent. The evil had become of such crying magnitude as to call for legislative interference in the amendment of the poor-laws, by which an effectual bar was put to the baneful system of relief in aid of wages. Being based on sound principles, the change was calculated for the ultimate benefit of the labouring-classes. It was fraught, however, with hardship to those who had surrounded themselves with large families, on the faith of the old system. Subsequent unexpected events, however, contributed greatly to mitigate those hardships and to put the labouring population on a more independent footing, with regard to the remuneration for their labour, than they had for a long time enjoyed. But though a period of agricultural distress, it was still a period of agricultural progress; and though we often heard of large tracts of land which were to go out of cultivation we never witnessed them. On the contrary, the enlargement of farms continued, as well as the inclosure of wastes. Towards the close of this period we may date the foundation of the Royal Agricultural Society, and the stimulus to improvement communicated by its *Journal* and its annual itinerant meetings.

That important portion of our agricultural history remains to be considered—the progress of British agriculture since the repeal of the corn laws and the unrestricted importation of all descriptions of agricultural produce.

In our review of the progress of British agriculture during the last century, we have arrived at that most interesting period of its history during which the British farmer has had to contend in his own market with the agriculture of the whole world. It must be admitted that the period which has succeeded the alteration of the tariff and the repeal of the corn laws has been a period of great agricultural prosperity. The fact does not admit of a question, whatever difference of opinion there may be respecting the cause. The most zealous free-trader must also admit that the problem is complicated, with many disturbing elements. There is the extensive emigration from Ireland, caused by the

potato failure; and from England, by the Australian gold fields. The gold discoveries, too, have given a great stimulus to industry, though they have not had as yet any appreciable influence in depreciating the value of gold with respect to commodities, while they have had as little influence in restoring the relative values of gold and silver, as they existed before the opening of the silver mines of Potosi. Then, again, some influence must be ascribed to the demands of the war, for agricultural produce for the supply of fleets and armies. Something also must be allowed for the waste of war. Of the grain that was burned by our fleet in the Sea of Azoff, a part at least would, in time of peace, have found its way to our markets. Something also must be put down to the increased rate of freight caused by the war; not from risk of capture, for the Allies were in undisputed mastery of the seas, but in consequence of the demand for shipping for the conveyance of troops and munition of war to the Crimea. Yet with all this there has not been that collapse of prices on the return of peace which took place on the termination of the war with the first Napoleon.

This period of unrestricted competition with the whole world has been an epoch of great, of rapid, and of sound agricultural progress. All the physical sciences have been sedulously cultivated in their connection with agriculture. Thousands of tons of shipping have been employed in the importation of foreign manure from the guano isles of the Pacific; while countless manufactories of artificial manures have sprung up, to supply the farmer with substitutes for those foreign supplies of guano which the present extensive and increasing demand must exhaust before many years have elapsed. Millions of money have been expended in draining our strong lands, and restoring them to that rank which they held in the estimation of the farmer before the introduction of the turnip husbandry caused the preference to be given to the less fertile light and dry soils, better adapted to stock-keeping on arable land, by which its produce has been so largely increased.

Well were the advances of this period described by one who bore so large a share in urging them on—Pusey, of Pusey. The progress in agricultural mechanics is regarded by him, in that celebrated paper, as that in which scientific knowledge has done most for the farmer. From the diminution of the numbers of horses used in husbandry, as shown by the returns to the Tax Office, amounting to nearly 20 per cent., it is inferred that this diminution has arisen from the substitution of ploughs of better construction, drawn by two horses, for the cumbersome implements of former periods, drawn by three, four, and even six. We cannot, however, assent to the writer's proposition, that this improvement has been carried as far as it is capable of, or that there is any land in England which cannot be ploughed as well, or better, with two horses as with more.

Then there is the reduction of horse-labour by the substitution of one-horse carts for waggons—a saving estimated by Mr. Pusey (and we think very justly) at

one-half. Yet in low-lying districts of the south of England has the one-horse cart superseded the waggon. Among the improved implements which have become during this period much more common in the hands of farmers is the drill for corn and turnips. At the commencement of this period drilled turnips were almost unknown, except in Scotland and the Scottish border. They were deemed in the old turnip-growing districts as a waste of land. Now even there they are the rule, and broadcast turnips the exception. The drilling of corn, now so general, was then confined to the northern districts, and to Lincolnshire, Norfolk, and Suffolk.

The water-drill is quite a modern invention, enabling the farmer to secure a plant of turnips in dry weather ready for the expected rain, in waiting for which the season was often lost. It possesses other prospective advantages; but this is a question which we will consider more in detail hereafter.

Next comes the improvement in implements for cutting straw into chaff, as it is called, by which the cost of keeping farm-horses may be decreased at least one-third; while the condition of the animals is improved. For beasts and sheep, cut chaff, with a little oilcake, or, better still, linseed-meal, is rendered equal to hay.

But the most important improvements in agricultural mechanics belong to the close of the present, or fourth, period of the agricultural progress of the past century—the reaping machine and the steam-plough. The former is valuable to the farmer, not so much for the diminution of expense in the cost of harvesting, as for the command it gives him over his crop, and the power of taking advantage of a few fine days in our uncertain climate. And with respect to the steam-plough, those who agree with Mr. Pusey that the two-horse plough was beaten on the Essex clays, because the land could not be broken up with them in a dry season immediately after harvest, must admit that the steam-plough has obviated that objection.

Proceeding from agricultural mechanics to operations for the improvement of the land, we come to land-drainage, which, it must be admitted on all hands, should be the precursor of all other improvements.

To the third period of the history of agricultural progress, or the period of low prices, belong our greatest advances both in arterial or trunk drainage and land drainage. In arterial drainage we have the expensive works undertaken by private enterprise for gaining outfall in the Lincolnshire fens. To this period also belong the improvement of outfalls undertaken by the Government in Ireland at the suggestion of the landowners, and now so loudly complained of by them; a fact which places in a strong light the wisdom of abstaining from Government interference in such undertakings—of leaving them to private enterprise, merely removing by legislative enactments those impediments by which the ignorance and prejudice of the few are now too often able to baffle the intelligence and enterprise of the many. To this period, and that which preceded it, belong also the successive improvements in the drainage of land, the improve-

ments of Smith of Deanston, and of Parkes; together with some further which certain people tell us are yet looming in the distance. We should rather say that the extension of land-drainage originated, and was prosecuted with the most ardour, in the preceding period of agricultural distress, during which it was sought to compensate for lowness of price by increased produce, raised at less proportionate cost. It is too true, we fear, and lamentable, that with the return of remunerative prices our energies in the improvement of the soil by draining have abated. Perhaps we may attribute the present slackness in land-drainage to the growing opinion that we have been proceeding too much on the principle of bending Nature to our systems, instead of accommodating our systems to Nature. It is in the laying out of our drains, not at regular intervals and uniform depths, but at depths and distances regulated by the nature of the soil and subsoil, and what may be called their subterranean conditions, that improvements are now to be made, by which economy, as well as efficiency, may be secured. In the cheapening of materials for draining, by the substitution of machine-made pipes for tiles and soles or broken stones, we appear to have reached a point not to be surpassed.

Resuming our review of the progress of agriculture during the last hundred years, we come to the improvements effected by the removal of useless fences. These are an evil which prevails most in those districts that have been the longest under cultivation, and have continued the longest the districts of small farms; in Devonshire for instance, in the clay districts of Norfolk, and in the Weald of Kent. In those quarters it has been proved, by actual measurement of large areas, that the loss of land covered by superfluous fences amounts to more than ten per cent., to say nothing of the injury sustained by the land which the trees overshadow, and which their spreading roots impoverish. Besides these evils there is the loss of time occasioned by small fields, in ploughing and other similar operations, and the mildews and blight which small enclosures engender, as well as the loss of grain from the birds which they harbour. The only set off against these evils is the picturesque effect, and the traditional connection between hedgerows and the English landscape. For these reasons we are sometimes tempted to exclaim, “Woodman, spare that tree,” when stern utilitarianism would say, Down with it! If, however, our agricultural improvers possessed more acquaintance with the principles of landscape gardening, the two opposing interests might in some measure be reconciled: the produce of the soil might be increased, while the beauty of the landscape might be preserved, if not improved; for it is in the happy collocation of trees, not in their number, that the beauty of scenery consists. To the lover of trees then, and we confess to be among the number, we are happy to be able to hold out this consolation—that it is possible to reconcile agricultural improvement with the preservation, if not the increasing, of the beauties of the country.

During the period under consideration a considera-

ble improvement took place in abating the nuisance arising from an excess of game, though much yet remains to be done in that direction for the benefit of the farmer, who suffers from its depredations; of the rural labourer with whom the poaching which large preserves engender is the first step in crime; and lastly of the true sportsman, who likes to work for his sport, and denounces the modern battue as being no better than shooting fowls in a farm yard.

Chalking, claying, marling—and mere chalking in some districts passes under all these names—are local practices of very high antiquity, which during the period in question have been extended to districts in which they were previously unknown, and might be extended still more. Bones began to be used as a manure during the second period. Towards the close of the third and the commencement of the fourth their use became greatly extended, and their consumption economised by the knowledge of the chemical fact that their manuring powers are derived, not, as was previously supposed, from the animal matter adhering to them, nor from the fat contained in them, but from their earthy portion, or phosphate of lime. Their employment in a state of solution has greatly economised their consumption, while it has extended their use; and farmers cannot be too often reminded that we owe this improvement not to agricultural societies, but to Liebig and the British Association. During the last, or chemical period, great improvements have been made in the management of our manure heaps. To this period belong the introduction of box-feeding, covered farm yards, and the application of manure in the liquid form, by the water-drill, and by the steam-engine with pipes laid under ground. The former method, as might have been expected from its greater connexion with established agricultural usages, is the favourite. With respect to the latter there can be little doubt that where there is a steam-engine on a farm, it is desirable to have a portion so irrigated for the purpose of producing Italian-rye-grass, though it is doubtful whether the disadvantages attending the conversion of all the solid manure of a farm into the liquid form may not overbalance the advantages. At all events this mode of distribution must be of great value in reference to the question of utilising the sewage of our towns. We have had writing and arguing on that subject for the last twenty years. The proper course would have been to have had some experiments on this mode of distributing town sewage, made at the public expense, with the sewage of towns, or of our barracks. We ought to have had long ago numerous analyses of the sewage of towns, and more particularly of different quarters of London, conducted at the public expense. It would not then be a question, as it is at the present moment, whether the wealth contained in the sewage of London shall be wasted in the ocean. We thought the analysis of Professor Way had set at rest the question of converting it to the solid form, in order that it may be redissolved for distribution by the manure-drill. For those analyses, as far as they have

gone, have shown that the manuring properties will remain in the liquid after it has been deodorised, and that to precipitate its ammonia and phosphates at a cheap rate, is a task beyond the present resources of chemistry. Had more such analyses been made, we should now be in a position to decide whether, with our present engineering resources, the sewage of towns can or cannot be distributed with a profit, in the liquid form, as Smith of Deanston contended it could be. If it cannot, we fear the late sanitary improvement will have been injurious to the agricultural community, by producing a waste of that which used formerly to be, to a large extent, returned to the land in the shape of night-soil. The present state of the sewage question is a disgrace to the 19th century. The recently-appointed commission to inquire into the best mode of utilising town sewage is a step in the right direction, though it should have been made much sooner.

One of the greatest improvements in the ordinary routine of agricultural practice is that which is employed by some of the best farmers of a few districts, and which, if generally adopted, would prevent a great expenditure of useless labour—the autumn cleaning of fallows, and the forking out of couch, docks, and suchlike weeds. This improved practice, if not always allowed by the climate of the northern districts, enables the sheep-farmers of our southern counties to take a spring crop of rye or winter tares for sheep feeding on the land in course for turnips, and thus to add a fifth crop to the ordinary four-course system. No less important than this saving of expense in that heavy item of expenditure, the preparation of the ground for the turnip by the winter cleaning of fallows, is the economy introduced in the expenditure of this crop when raised, by the cutting of it for the stock, and by giving them cut straw for their dry food.

The introduction of white carrots, as a forage crop, and the pulling and storing of swedes in the autumn, for consumption in the winter and spring, are valuable additions to our agricultural practice, which were scarcely known in the second and third of our four agricultural periods, and were then derided, in the practice of the few who used them, by those who were deemed at that time some of our best farmers. They have become more common in the fourth period, but are not yet so common as they might be.

There is one forage crop, and one indigenous plant yielding a perennial produce, which has long been used with great advantage in some districts not the most celebrated for agricultural progress. The Journal of the Royal Agricultural Society has more than one paper bearing testimony to its merits. It has long been in use in North Wales for feeding horses, and more recently as food for milk cows; while in Wexford, land not worth 3s. an acre for other purposes, lets for £3 an acre as gorse ground, for the rearing of young cattle. We have seen abundance of poor land in some of our southern counties where this plant grows with the utmost luxuriance, on land of little value for other purposes, but on which its cultivation is utterly neglected. We can only account for the little estimation in which it is held by

the fact that it grows spontaneously, and our farmers cannot get over their repugnance to growing what they consider a weed.

Taking a general and retrospective review of the details which have been adduced of the progress of agriculture, by the introduction of improved practices, and the extended diffusion of the best existing practices, we must arrive at the following conclusions—That the soundest and most extensive improvement, by which an increased produce is obtained at a comparatively diminished cost, has been effected during the third and fourth periods of the agricultural history of the last hundred years. It began during the third, which was a period of agricultural distress, when our energies were stimulated by low prices, and the necessity of compensating for them by increased produce raised at comparatively less expense. It is

still in progress, during the fourth period, when we have had to endure open competition with the agriculture of the whole world, and when we have had higher prices than at any former period since the termination of the wars of the French Revolution.

With respect to the progress of agriculture during those four periods, as regards the condition of the agricultural labourer, we have already glanced at the deterioration on his position, which commenced in the first, and was completed in the second. We will close this review of the last hundred years, by considering his condition during the third and fourth periods, and by the discussion of the question how far the system of large farms, and of capital applied to land, which is the inevitable tendency of the present age, can be rendered consistent with the unimproved condition of the labouring population of the rural districts.

### AGRICULTURAL EDUCATION.

In our former article on this important subject, we took occasion to advert to what may be called the "popular view" of agriculture, and its social and scientific status; and to point out briefly what we considered the causes which lead to this view being so universally held. But whatever may be the opinion which may be maintained on this point, doubtless a very potent cause is the indifference of agriculturists themselves. A full and candid inquiry into the whole bearings of the question would, we think, reveal the not very pleasant fact that a large majority of "well-to-do" agriculturists do not realize the essential importance of the question, or seem to think—if, indeed, they think at all—of the claim which the agricultural population under them have upon their attention. When we see a Manchester cotemporary somewhat complacently talk of "social improvements" being "transplanted from these stirring, expanding, and progressive districts to break up the stagnation and illuminate the darkness of the agricultural mind," we not only get a proof of the existence of the "popular view" to which we have already alluded, but we are led, or should be led, to inquire whether this "stagnation" and "darkness"—which are here taken quite as granted—really existed? and if so, why? and if—which is in no-wise the least important question—the one *can* be broken up and the other in *any way* illuminated?

As to the first of this series of questions which we have here propounded, we fear that but one answer can in fairness be given. As to the relative extent of the "darkness," or the amount of the "stagnation," there may be various opinions; there can be but one opinion, we think, as to the fact that they do exist to some extent in nearly every district of the kingdom. In some—how many?—the one may be like the darkness which afflicted Egypt; the other like the plague of frogs which there came up and spread over all the land. It comes not within the scope of our present paper to enter into a detailed proof of the evils of the social

condition of agricultural labourers; not that there is any difficulty to do so. Suffice it to say that much as philanthropists have to deplore in connection with the social condition of the "working classes" of our large towns, about which so much has been written and agitated, they may easily meet with as much to rouse their sympathies and awaken their zeal in our agricultural districts. Unfortunately, neglect and indifference can, and do, work their deadly work as easily, and with as lamentable effects, beneath the blue sky and amidst the grain fields of our hamlets, as in the murky air and filthy lanes of our crowded cities.

The answer to our second question is not quite so easily given as that to our first, involving as it does the consideration of many points, all of great importance. Leaving a few of these to be noted afterwards, we shall attend at present to one—namely, the faults of the system or mode of teaching as commonly carried out in the schools of agricultural districts. This, it will be observed, does not open up the question of how widely extended the system of education is, but refers to the inadequacy of the education, such as it is, to impart the knowledge desiderated. Mr. Evan Davies, at a recent meeting of the Bridgnorth Agricultural Association, puts this matter very forcibly. In eulogising the common education, as it is termed, at a school in his district as coming "nearer to perfection" than any school with which he was acquainted; and while feeling assured that in the extent of their geographical and grammatical attainments the male scholars would display a satisfactory condition, still "such was the meagreness, or, to speak more properly, the utter want of education in points which would possess a *money value* to them in their daily pursuits, that he much doubted whether any of them could tell even the "common things" of agriculture, let alone those having a more important bearing, essential to be known by one who proposes making the most of his business. "I much doubt," he remarked, "if one in a hundred could explain the germinating process of the



wheat, barley, and oats which it will be their province hereafter to scatter upon the ground"; or if one "in a thousand of them could describe the nature and habits of those insects and fungi which infest and destroy those crops which they will be called upon to cultivate and protect." Again, with regard to the education of the girls, the same meagreness of utilities in their education is noticeable. Few of them leave school with a knowledge of those parts which will be of service to them in their daily duties. The truth, in fact, seems to be that their ordinary school education has no reference to what must in after-time be their daily life. We have, in our former article, alluded to this defect as existing to a great extent also in the routine of education given to the higher and middle classes—those who are in after-life to be the farmers who cultivate, and our landlords who own the land. Hence it is that such an absurdity is met with as a farmer persisting in the statement "that ryegrass turns into switch, when they are as distinct as wheat is from barley." Hence, also, do we often witness the anomalous position of "possessors of large territorial domains" regretting at agricultural meetings "that toasts have been put into their hands, for they know nothing of agriculture"; as reasonable an excuse this as would be that of a cotton manufacturer or an iron merchant who would tell their clerks and their managers that they know nothing of cotton, and were quite ignorant of iron. Hence, also, do we find the owners of large estates so blinded to their own interests, and hazarding the prosperity of their property, by giving their management "to the care of some old college companion who has retired from the army or navy, or sometimes to reward the faithful services of a groom or a valet, and too often in the case of those who have received their education at Lincoln's Inn"—as wise a course of procedure as to entrust the management of a ship to a cotton-spinner, or a cotton factory to a sailor. Hence, also, the inauguration and perpetuation of other follies and absurdities too numerous here to mention, and in no way pleasant to reflect upon. No wonder then, seeing all these things, that the "popular idea" of agriculture is by no means a complimentary one to its professors, and that Manchester men desire to see its "stagnation" broken in upon and its "darkness" enlightened. And "no wonder," to quote again the words of Mr. Davies, that the science which is "co-existent with man's creation should only be emerging from its dark ages; no wonder that it is only just now being thought worthy of being placed side by side with those other sciences which have made such rapid strides throughout the world."

At the first blush of the matter, it seems no great difficulty to obviate the evils arising from this exciting cause of the darkness of the agricultural mind. Light is not altogether unattainable, much as some may say to the contrary; neither will its attainment cost much—a most important point to remember in this our day of utilitarianism, when the question, "Will it pay?" is more earnestly taken heed to than "Is it right?" Mr. Davies seems to think that much "light" must not be looked for "until the whole class of books in our agricultural

schools are forgotten, and a new compilation takes place, not only for labourers, but for farmers, land-agents—aye! and landlords themselves." Now when people are by no means anxious to perform a duty, or to clear out of hand a task allotted to them, it is marvellous with what ease they persuade themselves that the thing cannot be done at all, or at least such are the difficulties in the way—tools, for instance, bad—or the wants which cannot be supplied—no tools at all, for instance, to be had on any account—that its doing or performance must of need be put off till some more convenient time. Different from the conduct of him who, in spite of all difficulties, is determined to do his work, thinking more of the doing than of the difficulties; such a one, rather than plead a "want" of aid as an excuse for not working, will manufacture his own aids—make or mend his tools. Just so is it possible that many believing, or thinking that they believe, that this supplanting of old and altogether effete class-books with others of a life-giving, life-sustaining nature is a huge labour, and one taking up much time, will deem that there is no hurry in looking after education at all. The work, doubtless, they admit, must be, should be, done; but wherein lies the good of *bothering* ourselves about it now, seeing that we have no tools to do it with? "Time enough," may be their sage remark, "to prepare the wood when we can get the saw." But the case is not quite so bad. True the aids at our disposal are not so complete in number, or so good in quality, as we should desire; but we have some, and of good every-day working quality, well calculated to do the beginning, if not quite the finishing, of the work. And this beginning is a great matter; no step in any progress is so important as the first. Some agriculturists, in no wise to be characterized as of "stagnant" or of "dark" minds, are quite of this way of thinking. Farmers, emigrants from Scotland, desirous to make the most of the raw materials ready to their hands, are purchasing Stephens' "Catechism of Agriculture" (Blackwood) by thousands, we are told, to distribute amongst the population of their Irish farms. This is the right way to go to work, and is in every way characterised by true wisdom. It is by no means a bad set-off to the universal cry from towns commercial as to the "darkness" of districts agricultural. Egypt enough—where darkness may be felt—and more than enough, have we poor agriculturists; but have we not also, O men of Manchester! a few Goshens amongst us, where light dwelleth—Goshens from which a light may go forth, of which even that go-a-head locality may be somewhat the better.

"The British labourer," according to a recent writer, "is the best living tool in the world." This is taking the strictest utilitarian view possible of the point, and is indeed the light in which not a few minds, commercial as well as agricultural, look upon their assistants, by whose labours they "net their profits." Not now to take a higher view of the matter; to ignore, in fact, all considerations of humanity, and to talk political economy merely, the question obtrudes itself very forcibly whether in process of time it may not be worth the labour of manufacturers of wheat, as well as those

of cotton, to inquire into the condition of these "tools" of theirs, with a view of ascertaining if possible the manner in which they operate, and if kept in good repair and in fair working order. Such an inquiry might pay very well, if well conducted, and the suggestions which would be evolved therefrom carried into effect. It is not considered the best evidence of a workman's tact to keep his tools in bad repair, or a master's wisdom to have his implements or his steam-engine in such a condition that time is lost, and profits used up, by repeated attempts at patching and mending. To have matters the converse of all this is, as we all know—or at least profess to know—the best business policy. And it is just possible that some fine, and we hope some early day, masters may wake up to the conviction that to keep their "living tools," their "flesh-and-blood engines," in good condition, will be a wise and business-like proceeding on their parts. But this good time will, we fear, be somewhat delayed, so long as "relays" of tools are obtained at little cost and less trouble. Albeit it may be worth the thinking about, that bad tools are not worth the having at any price, nay, at "no price;" in fact, that bad tools cannot, in virtue of being bad, do good work by any possibility. And if the farmers of England are to compete successfully with those of other countries—if, in fact, they are to do the work which is demanded of them, it is imperative that they should have all their mechanism, animate as well as inanimate, in the very best working order; capable of doing not only good, but the best of work. But it so happens that the task of keeping animate machines in this good working order involves considerations of a somewhat different character from those connected with the inanimate. We have, fortunately or unfortunately (the latter, perhaps, for those stern political economists whose pet projects are sometimes unceremoniously set aside through its existence), a double power to deal with—the intellectual, as well as the physical organization, in connection with our animate machines. And the fact is, that unless we allow both to have their full, healthy development, we do not attain a perfect, but only a half machine, and of course capable of doing only half work; if, indeed, we obtain so high a ratio therefrom. And this fact is by no means a less truthful one, because in every-day life we find many who ignore its existence, and seem to think that not only is mind not desiderated in their labourers, but a sound healthy body also. These men are, to be sure, of the "Squeers' mixture," and "pinch-of-curry-powder" order; whom, for the honour of our kind, we presume to be in a decaying and by no means popular condition; but who exist nevertheless, and are not very difficult to meet with. Hence it comes to pass, that if the mind acts upon the body, and the body acts upon the mind, and that no "good health," in the fullest acceptation of the term, can be maintained without the wants and necessities of both being equally well attended to—education involves other considerations than that merely of making provision for the supply of intellectual food; and that so far as the labourers of our rural districts are concerned, two processes must, from the necessity of

the thing, go hand in hand, if full satisfaction is desired—while the mind is cared for, the state of the body and its physical demands must not be unprovided. The former point involves one weighty consideration, namely, that time be allotted to those requiring education, that this education may be given to them. To provide the best possible system, and yet to give no time to those to attend to it for whose benefit it is instituted, conveys on the face of it an absurdity. At first sight the difficulty here pointed out appears an easy one to be got over; it nevertheless has associated with it points which, if attempted to be carried out universally, will rouse the opposition of not a few, and give rise to a great amount of acrimony and ill feeling. In the great cotton districts what is called the "half-time" system is in force, "under which it is illegal to employ children of a certain age unless a portion of their time daily is spent in school." It is quite obvious that if we begin to carry out an improved and useful agricultural education amongst the labouring classes, we must begin with the young. It is an almost hopeless task to think of working up the "stagnation" and enlightening the "darkness" of the adult mind. A little, perhaps a good deal, may be imparted to them, but all we require cannot. We shall have difficulties with the old which we shall not meet with in the young. Some plan, then, to obtain time for the young must be carried out; and we are glad to see the "half-time" system, as applicable to agriculture, mooted in influential quarters. At a recent meeting of the Hants and Wilts Education Society, the Dean of Hereford, well known for his successful efforts in the cause of popular education, thus spoke of it:—"The system had worked so admirably in cities and large towns, and was now in such favour, not only with the operative classes, but also with the great employers of labour, that it had occurred to him to inquire whether it might not be possible to establish something of the same kind in the agricultural districts. \* \* \* If the child of an operative needed protection as regarded his education, and if the Legislature interfered to insure him a certain amount of schooling, why should not a similar privilege be conferred upon the ploughboy, and on the child who was sent into a field to watch the crows? A half-time system, which would contemplate that on every alternate day such young persons should be withdrawn from their occupation for the purpose of attending school, might perhaps be feasible. At all events, the question was well deserving of attentive consideration." Surely this will be given to it; the subject is one of paramount importance, not only to the labourers, but to their employers. If it does not *now* bulk largely in the agricultural mind, the time will come when it will do so in its full importance. Difficulties are certainly in the way, and various adjustments of polity and interest will require to be attended to; but it will be in every way the wisest course for the parties directly interested—the agricultural employers—to overcome those difficulties and make those adjustments themselves. Better that they should do it voluntarily, than be compelled to do it, a compulsion which will afford them neither the dignity of a refusal nor the grace of a ready compliance. In-

deed some are of opinion that this compulsion is not far distant. At the above meeting Mr. Cole remarked—“Come what might, the people must be educated. It was all nonsense for the farmers to say they would not stand it. Whether they liked it or not, they would have to stand it. And why not they, as well as the manufacturers? If the Legislature were to say to the farmers, ‘We are resolved that you shall stand it; and you are to understand that, if you have in your employment young persons of a certain age who are not educated up to a certain point, you shall be subjected to a penalty,’ the farmers would soon come to their senses, and appreciate the force of such an argument. This was a drastic mode of treatment that would not fail to carry conviction.” To this complexion must it come at last? Certainly it will be a difficult matter to prove why farmers should possess an immunity from Legislative interference, which the manufacturers did not, or at least could not, claim. If the “drastic mode” of treatment is to be carried out, would it not be better for the agriculturists to have it self-administered? The medicine may be bitter, but its effects will be sweet.

We have observed that in the education of our agricultural labouring population, two things must go hand in hand—care of the mind and provision for our body. Not quite in the literal sense of the term “provision” do we wish it understood, although doubtless it may be said that he who works well is entitled to feed well, and has a plain right to that same; of which it is robbery, to speak frankly, to deprive him. Although we do not here say how many labourers are thus subjected to theft in this enlightened land of ours, but in a wider sense do we wish it rather. Provision, that is, not what to eat, not that which is eaten—may its shadow never prove less in the homes of the poor!—may it have fair-play given to it; that it may nourish healthy bodies, and rear up good working “tools;” to which end it seems advisable—if we read not physical laws wrongly—that good houses shall be given, and as a matter of course that all huts or hovels or “men’s pig-styes” shall, with all convenient speed, be done away with, not longer to stand as evidences of the utter neglect of the true principles of political economy on the part of their landlords. For can it not be clearly shown that it is at the best but a losing concern, to put valuable animals, as horses or cattle, in badly-constructed, damp, and ill-ventilated stables or cowhouses, where the disease engendered and promoted thereby causes the total loss of many, and the deterioration of value in all? And although in the minds of some it may appear doubtful whether the importance of human life bulks so largely in their estimation as that of a horse or a valuable cow—as a labourer can in this land of liberty be had and obtained without any purchase-money—is it not also evident that to place labourers and their families in huts or hovels, where none of the decencies, let alone the comforts of life, can by any possibility be obtained, is not quite the best way to procure labourers able to give a good day’s, or a day’s good work, we shall not say for good wages, but for such wages as may then and there be given them? The

healthier and the stronger the labourer is, the better able is he, most undoubtedly, to serve his master.

But another point, and possibly not the least important, remains to be noticed. We have already pointed out the fact too apt to be forgotten by many, that the “best living tool”—the “British labourer”—is made up of a mental as well as a physical organization; that there is a close and intimate connexion between the two; and they mutually act and re-act on each other, with a morbid condition of the one bringing often with it a morbid condition of the other. Now, in advocating the necessity of making good “provision” for the labourer, as regards house or home accommodation, we are but in another way advocating that which will tend to keep the mental faculties also in a healthy condition. For even at the first view of the matter it seems evident that much of the *good* done by out-door education will be lost, or at least greatly lessened in beneficial influence, if the home or the hearth education inculcates all that is bad. “The general character of the best of the old-fashioned hinds’ cottages in this neighbourhood is bad at the best. They have to bring everything with them: partitions, window-frames, fixtures of all kinds, grates, and a substitute for ceiling, for they are sheds. They have no byre for their cows, no stairs, no pumps or wells, nothing to promote cleanliness or comfort. The average size of these sheds is about 24 by 16 feet; they are dark and unwholesome; the windows do not open, and many of them are not longer than 20 inches by 16 inches; and into this space are crowded eight, ten, and even twelve persons. How they lie down to rest, how they sleep, how they can preserve common decency, how unutterable horrors are avoided, is beyond conception. The case is aggravated where there is a young woman to be lodged in the same confined space who is not a member of the family, but is hired to do the field work, for which every hind is bound to provide a female. It shocks every feeling of propriety to think that in a room, and within such a space as I have been describing, civilized beings should be herding together, without a decent separation of age and sex.”

Doubtless it may be said that this is an isolated, an exceptional case; that such is not the general way in which agricultural labourers live. While gladly admitting that much is now being done to ameliorate their condition, very little, we grieve to say, in proportion to what should be done has been done. That this day a counterpart to the condition of affairs we have above described can be easily met with in many of our agricultural districts, we have not the least shadow of a doubt. Would that it were otherwise! We are quite aware that to many there will be a difficulty in tracing the connection that exists between physical and mental degradation, and how, or in which way it bears upon the question of education. They are closely connected nevertheless; so closely that to those who are devoting much of their attention to the social welfare of the working classes the truth is becoming more and more obvious, that in all movements for the improvement of their mental condition attention *must* be paid to their physical improvement also; that if the sanitary

reformer should not precede the teacher, he should at least go hand-and-hand. This is taking high ground; but it is a position borne out by all investigations into the subject.

At first sight the connection between physical and mental degradation is obvious enough; the proverb "cleanliness is next to godliness," whether right or wrong, proves that in the popular mind a close connexion has been observed between them. Where human beings congregate together, or are *forced* to congregate together—a statement of the point nearer the truth—under circumstances akin to that of the brutes, where none of the requirements of decency and morality can be observed; however long they may fight against the evil, mental degradation invariably ensues, just as closely as effect follows the cause. All experience shows this: proofs innumerable of it in this our enlightened land can be met with in dwellings, "where," says John Kay, "all ages and all sexes, fathers and daughters, mothers and sons, grown-up brothers and sisters, stranger adult males and females, and swarms of children, the sick, the dying, and the dead, are huddled together with a proximity and mutual pressure which brutes would resist; where it is physically impossible to preserve the ordinary decencies of life, where all sense of propriety and self-respect must be lost, to be replaced by a recklessness of demeanour which necessarily results from vitiated minds."

Not here to state whether this horrible condition of affairs can or cannot be met with in agricultural districts, it is evident that all approach to it must of necessity be avoided, if the power of education is to have full play. Intellectual and moral elevation cannot result

with certainty from any plan of aggressive operations, however well and persistently carried out, when at their homes and around their hearths everything nearly is calculated to degrade. As an uneasy condition of mind operates upon and lowers the condition of the body, so in like manner deleterious causes habitually operating on the body depress the mind and lower the moral standard. It is hard to arouse the attention, or awake the sympathies of a man under the influence of an opiate, or sinking under the effects of a slow fit. It is just as difficult and absurd to look for elevating results from education (as a general rule) amongst people who are placed in circumstances which act on them with all the depressing influences of the one, and all the debilitating powers of the other. Certain laws have by a beneficent Providence been instituted, the which, if we respect, we shall maintain a due amount of physical and mental health; and which fit us better for the reception of important truths than when we have the dulness and disease resulting from breaking these laws. And it certainly seems the most reasonable plan, if not the clearest duty, to maintain that condition in which we are the best fitted for the reception and consideration of important truths—moral and religious—than to maintain adverse circumstances, lessening their force and obstructing their influence. Now, in advocating the removal of these adverse circumstances from amidst our agricultural labourers, we are aiding the means by which their moral and intellectual elevation is brought about, and without which no system of education, however well adapted to the special wants of the class, can be thoroughly efficient.

R. S. B.

## ON THE MANUFACTURE OF SULPHURIC ACID.

It has been well remarked that if the common labourer in any art cannot be enlightened by abstruse doctrines of philosophy, yet he will not refuse to adopt any practice, of the utility of which he is fully convinced, because it has been founded upon these principles. The mariner can trust to the compass, though he may be wholly unacquainted with the discoveries of Faraday and Tyndall on magnetism; and the dyer will use his bleaching liquor, even though he is perhaps ignorant not only of the constitution, but even of the name of the substance on which its powers depend. Yet is it not admitted by all intelligent and thoughtful men that an art progresses in some proportion to the measure of knowledge of its principles diffused among its practitioners? And, that agricultural science is at present most in need of, is a general superintendence of field and farm-yard husbandry, by men who can take note of circumstances bearing upon a principle, and who will let no fact escape which is able to throw light upon any mystery in cultivation? Not that every farmer is to go through a scientific college education, and have his labourers loiter while he is wasting time over bottles, and squirts; but at any rate let him learn somewhat of

the great fundamental truths of his art, and the character of the natural processes at work within his land, his crops, his animals, and his manures. Let him cultivate "fields of thought" and habits of reflection.

Think, for instance, on some of the wonders of a root crop. You need not now slaughter and salt your fat sheep in November, as your forefathers did, because these nutritious bulbs are able to withstand the winter: and again—not a vast period from their introduction into this country—you have machinery for rasping or slicing them; implements for hoeing-out the young plants; a water-drill for sowing the seed "in a sure and certain hope;" and, most astonishing of all, superphosphate for forcing the first leaflets out of the reach of the fly, and magically stimulating the entire growth of the crop. Superphosphate! to think that a plain English farmer should have come to manure his ground with a powder the name of which implies something about lucifer matches, and an extra strength or quality.

And what is the history of superphosphate? You bought bone-dust and oil of vitriol, and, mixing with a little water, melted down the bones into that sweet-smelling substance which you so carefully cover from

the rain, and drill either in water or with ashes. So animals have eaten vegetables, and accumulated phosphate of lime in their spines, and ribs, and limbs; and dying, have left us the hard frame-work of their bodies, which we grind by thousands of tons yearly to make turnips of. But perhaps you preferred to purchase bags of the manure ready-made. Then you are daring to manure your fields with the "white and wave-swept bones" of not merely the antediluvian, but of the pre-adamite world, which have lain buried and preserved for many thousands of years, to be at last sacrilegiously utilized in this fashion. In mines now being worked, the beds consist of the fractured and rolled bones of sharks, gigantic lizards, and whales, which at a remote period of our earth's history must have existed in myriads in our seas; and mingled with these bones are found many fish-teeth and shells of different species, and also immense numbers of rolled water-worn pebbles, called coprolites. These "phosphatic deposits" are found in great quantities on the coasts of Suffolk, Norfolk, and Essex; in Cambridgeshire and Kent: and many thousands of tons, in one form or other, are annually sold as manure. Liebig predicted truly, that "in the remains of an extinct animal world England will find the means of increasing her wealth in agricultural produce, as she has already found the great support of her manufacturing industry in fossil fuel." But whence came those heavy carboys of sulphuric acid? and how can we obtain so cheaply such enormous quantities of a liquid which is so burning in its nature that the workman's fingers tingle when he thinks of it, and a spoonful will suffice to rinse your teeth out of your mouth?

In the old-fashioned times, this oil of vitriol, as it is also called, used to be made by distilling "green vitriol," or sulphate of iron, which was obtained by exposing the roasted iron pyrites, in small pieces, to the combined agency of air and moisture. But ingenious men having taken advantage of the investigations of scientific chemists, invented the modern manufacturing process, which is far more economical and productive. Many of us have held our breath, or gasped and coughed in semi-suffocation, as we passed by one of those large leaden chambers in some manufacturing town, which indicates a place where its preparation is carried on. The process is this: *Sulphur* is burned in *air*, with the help of a little *salt-petre*. The sulphurous-acid gas thus formed is conducted into the spacious leaden chamber, where it meets with nitrous-acid, obtained by the action of *starch* on *nitric acid*, and also with the *vapour of water*, introduced from a boiler. *Water* is also present on the floor of the chamber. Instead of the simple distillation of one substance—green vitriol—seven different agents or raw materials are employed; the resulting chemical action from thus bringing all of them together being rather complex. First, the sulphurous acid, nitrous or hyponitrous acid, and water, all in a gaseous or vaporous state, meeting together in the chamber, combine to form a compound, which falls down in crystals like a shower of snow. As soon as these crystals touch the water

they become decomposed, the sulphurous acid being oxydized into sulphuric acid, and the nitrous or hyponitrous acid reduced to deutoxide of nitrogen. The sulphuric acid dissolves in the water, and is so taken care of. The deutoxide of nitrogen rises into the air of the chamber, in which a continual current of atmospheric air is kept up, and with the oxygen of this air again forms nitrous acid. This, uniting with a fresh proportion of the sulphurous acid and watery vapour which is continually pouring into the chamber, forms the same crystalline compound as before, which falling, and being decomposed by the water as before, deutoxide of nitrogen rises, again forms nitrous acid, and again the crystals are formed and decomposed; and so on continuously, sulphuric acid being added to the water at every decomposition. In this way a comparatively small amount of deutoxide of nitrogen, supplied at first as nitrous acid, oxydizes an almost unlimited quantity of sulphurous acid, acting as a carrier of oxygen from the air to the sulphurous acid. It is only because a little of the deutoxide is unavoidably lost, being carried away with the current of effluent air, that a little nitrous acid must be added, from time to time, to the original supply. The regular supply of air and of steam is also of course essential. After the process has been continued for some time, the water on the floor of the chamber is found so strongly charged with acid that it no longer thoroughly decomposes the crystals. It is then withdrawn, and replaced by fresh water. This acid liquid, which is free from nitrous acid provided an excess of sulphuric acid has been present before drawing it off, contains only sulphuric acid and water, with perhaps a little sulphurous acid. It is boiled down in vessels of glass or platinum, to expel superfluous water, till a acid begins to rise in vapour; and it is now completely manufactured for the farmers' use.

If sulphur, in the mere process of combustion, would form sulphuric instead of sulphurous acid, all this complicated business would be saved. But one pound weight of sulphur unites in burning with only one pound of oxygen from the atmosphere, forming sulphurous acid; and the problem was, how to add another half-pound of oxygen, in order to make the product sulphuric, without using any expensive substance for the purpose. The above most ingenious and interesting process is the means by which the additional oxygen is abstracted from the cheap inexhaustible atmosphere, and by the consumption of a very small quantity of starch and nitric acid, conveyed to the sulphurous acid as required. Thus, with the addition also of a little water, a pound of brimstone (from Sicily or elsewhere) is transferred into three pounds of "concentrated oil of vitriol."

This process enables us to take advantage of the abundance and cheapness of the raw material—brimstone—and so obtain the acid at a mere fraction of its former price. This cheap supply of acid amazingly extends the capabilities of the arts, being employed in the manufacture of soda, bleaching-powder, nitric, acetic, and hydrochloric or muriatic acids; ether, alum, Epsom salts; in charging galvanic batteries for the

electrotype and telegraph; and in medicine and pharmacy. And through these, it is indispensable to the manufacture of glass, soap, and starch; indeed, there is scarcely a branch of industrial pursuit, scarcely a single article or product, which is not in some degree dependent upon it. It is interesting to think that the agriculturist should be co-dependent with the manufacturer upon the same useful agent—a circumstance which implies that there is in reality no antagonism of interest between the producers of bread and meat and of clothing and furniture; but, on the contrary, a mu-

tual and indissoluble bond of interest and similarity of engagement.

If the manufacturers of sulphuric acid had been bound to continue the methods of fifty years ago, and acid thus have remained scarce and dear, how many new arts would have been prevented from arising, and how greatly would the entire community have suffered! Think of this, landowners and agents, when you seek to bind down the sulphuric-acid-using farmer of the present day with antiquated restrictions and worn-out formulæ of former cultivation.

### THE WOOL TRADE.—IMPORTS AND EXPORTS.

The knowledge of the home production of wool, and the relative foreign and colonial supplies which reach us, are of importance both to the flockmaster and to the woolstapler.

Whether other countries are bidding in the colonial markets against us (and we know France and the United States have lately been endeavouring to induce direct shipments)—whether more is consumed on the continent, or whatever may be the cause, there is certainly a decline in the quantity of wool imported in the last two years as compared with the preceding. The receipts of foreign and colonial wool have been in—

1853 .....	119,396,449 lbs.
1854 .....	106,121,995 "
1855 .....	99,360,446 "
1856 (first ten months) .....	95,458,521 "

The exports of raw wool in 1854 and 1855 were, however, very large, more than double those of the present or preceding years, and probably our own home production is greatly on the increase; so that, after all, the discrepancy may not be so great as would seem, in the quantity worked up. There is one very satisfactory feature to notice, and that is, the rapid increase in our colonial supplies of wool, and the proportionate decrease in our dependence on foreign countries for this important element of our clothing trade.

The home produce of wool, estimated by competent parties in the trade, and confirmed by the evidence of the most extensive cattle salesmen, was stated at 32,000,000 fleeces, averaging about 4lbs. each, some few years ago; and this is probably still about the quantity clipped, although some parties estimate the average weight of the fleece much higher.

At the German Midsummer wool fairs, this year, the supplies of wool do not seem to have been large, and although some was held over in the expectation of still higher prices being obtained, yet the chief quantities were sold at greatly enhanced rates over former sales, showing the activity that prevails in the continental clothing manufactories, and that the Germans will be considerable customers to us for wools, rather than sending any quantity to the London market for sale.

France, Belgium, and the Provinces of the Rhine, now buy 70,000 or 80,000 bales of our colonial wool yearly.

The United States will long continue a large wool-importing country, requiring something like 150,000,000lbs. of wool, while she grows only a third of that amount, and her annual increase of population demands the fleeces of a million of sheep—bearing in mind that the wool of two sheep is required annually to clothe each inhabitant. The number of sheep in the United States is only about 25,000,000; and if we compare the population with the number of sheep in the principal countries, we shall form a better idea of markets and foreign demand and supply.

	Population.	Sheep.
France .....	36,000,000 ..	40,000,000
Austria .....	36,000,000 ..	33,000,000
United Kingdom .....	29,000,000 ..	35,000,000
Russia .....	60,000,000 ..	39,000,000
Spain .....	18,000,000 ..	18,000,000
Prussia .....	17,000,000 ..	16,500,000
Turkey in Europe .....	15,500,000 ..	14,500,000
Sweden and Denmark .....	5,500,000 ..	3,000,000
Finland and Norway .....	3,000,000 ..	2,500,000
Australia .....	1,000,000 ..	15,000,000
United States .....	25,000,000 ..	25,000,000

These figures are about the latest returns, and are sufficiently accurate for all purposes of comparison. The entire stock of sheep in the States of the German Zollverein is believed not to exceed 23,000,000.

The increase of wool production in the Cape colony is almost incredible, and is perhaps without a parallel in the history of colonial settlements in any part of the world. In 1845 the export of wool from the eastern province of the Cape weighed 728,765lbs., and was valued at £30,762. The total export in 1855 was 34,395 bales, containing 10,155,870lbs., valued at £523,855; and for the present year the exports from Algoa Bay will reach about 12,000,000lbs. These figures show an advance in pastoral progress in the last ten years which will almost bear comparison with that experienced in the gold regions; an advance, too, which has been made so silently, and with so little risk, that one would scarcely hesitate for a moment in choosing between the country in which it is made, and those regions of incident and accident where yet greater gains, and at the same time yet greater losses, fall to the lot of the inhabitants.

Through Port Elizabeth and Natal a large quantity of wool, raised by the Dutch settlers in the interior

free States, is now shipped. These States are particularly suited, from the value of the pasturage in the vast fields of upland park-like downs, covered with numerous kinds of saline plants and rich grass, for producing large quantities of wool—the finest in quality and most remarkable for length of staple, strength, and elasticity, the truth of which has already been proved by some of the fine clips of the flocks.

The wool sheep in the Orange River Free State number three-quarters of a million; besides which, large and numerous flocks of big-tail Cape sheep are kept by the Boers and the natives, for the sake of the tail-fat and the skin, which is better adapted for making their skin-blankets and karosses, or cloaks, than the skin of the wool-sheep. The Trans Vaal Republic and the Colony of Natal also now support many sheep.

We have not yet the complete returns, of course, for the present year, for all these African settlements; but our receipts of Cape wools in the first nine months this year were 33,779 bales, against 25,071 bales in the corresponding period last year.

Passing on to the Australian settlements—now, and for a long period to come, destined to furnish our main supply of wool—we are struck with the rapidity of the increase of wool. The opening of the interior of the country to the sea by steam navigation—now so successfully prosecuted on the Murray and its tributaries, and the further extension of railways, will greatly facilitate the transport of this staple from the rich pastoral districts of the interior sheep stations.

For the first year or two after the gold discoveries, less attention than usual was paid in Port Phillip to pastoral matters; and its former chief staple, wool, threatened to decrease in quantity and to degenerate in quality. Now, however, the squatters are enabled, by the abundance of available labour, to bestow proper consideration and care once more upon their flocks. The increased population, which now numbers about 350,000 souls, finds them a market for their beef and mutton; and they have no longer to boil down sheep and cattle by thousands, for tallow for export. The sheep in Victoria now number about 6,500,000. The special attention which is about to be given by the colony to immigration—large funds having been voted, and special agents sent home, to keep up a steady tide of emigration—will add still more largely to the pastoral population and the increase of sheep.

The steady progress in the shipments of wool from Victoria is shown by the following figures:

1845 . . . . .	6,811,813 lbs.
1850 . . . . .	18,091,207 „
1855 . . . . .	23,000,000 „

This affords an extraordinary and pleasing proof of the immense pastoral capabilities of this colony.

But other southern colonies—New Zealand, Van Diemen's Land, New South Wales, and South Australia—are also doing wonders in wool-production, and the recent discovery by Mr. Gregory's exploring party of extensive new grazing plains in North Australia will greatly extend the capabilities of the Moreton Bay District, and draw thither large flocks for feeding.

## THEORY AND PRACTICE.

When Mr. Cubitt made his statement at the North Walsham Club, to the effect that “there are many farmers ruined by theory, but very few are ruined by practice,” he could have little thought such an observation would have elicited so contradictory a commentary as that—“if ever a man was *ruined* at all, it was precisely *this* to which his ruin was to be attributed. What is the cause of agricultural failure, if it be not imperfect, ill-judged, careless practice?”

If Mr. Cubitt had stated, when he said *practice*, that he meant to convey to his hearers the term applied by the commentator in question—that he meant *imperfect, ill-judged, careless practice*—then he would have rendered himself liable to the remarks above quoted. But we do not concur in the interpretation put upon his words, or with the definition that follows upon the subject, by which the writer transposes *theory* for *practice*; for he asks, “What is the theory, to which more than to any other, agricultural distress has properly been attributable?” and replies, “There are such *theories* as that the style of farming by which the former generations prospered will answer not for the present; that education may be carried too far—to the extent of making farmers' sons and daughters good for nothing; that the doctrines of the chemist are mere specula-

tions; and that an ounce of practice is worth a ton of theory.”

He only justly states that such theories as these were not those referred to by the speaker, but very unjustly infers that he referred to such speculations as those of Baron Liebig, when he taught us the uses of the ammonia in the air, and rain, and therefore in manures; of Professor Johnston, who brought extensively to bear the force of chemical analysis on agricultural products, and substances of food for plants, and animals; of Professor Way, when he showed the absorptive powers of soil, and the stores of matter that have thus accumulated—and then he triumphantly inquires, “Are these the theories that have led so generally to ruin?”

Fuller, in his “Worthies,” speaking of the Earl of Essex, observes, “none being better than he at the theory, or worse at the practice of husbandry;” and so it is of modern professors, who treat agriculture as compounded of theories. We will, however, endeavour to explain the subject in our own way, and as no two words are more frequently misapplied than those of *theory* and *practice*, we will try to show what is the distinction in the sense in which we understand their application. Before coming to such distinction,

we will observe that a theory may be true, or it may be false : it is itself always more or less speculative, inasmuch as, although deduced from principles, still in the result it may, when improperly applied, be found imperfect ; or it may, when properly tested, be found perfect ; and in that case, as a theory it would have been a perfect one. Liebig stated that the dissolving of bones in sulphuric acid would probably render them soluble as food for plants. The theory was perfect ; and what was then a theory only became practice, as distinguished from theory ; being now the application of knowledge coming from experience. It therefore is not so connected with general principles to entitle it with the title of *theory* ; and thence the distinction, as applied to those who tread the fields of science and art, is not a just one ; “ for there is no theorist whose knowledge is all theory, and no practical man whose practice is all derived from experience.”

It was in this sense that Mr. Cubitt applied his observations as a man who had adopted the improved system of agriculture into his practice, which embraced all that had been registered as perfect, not only assumed in theory, but proved in practice. Mr. Cubitt might not have known that ammonia existed in atmospheric air ; or he might, knowing that fact, not have known in what quantity. But he knew from experience that the continuous exposure of a soil to its action restored to it its productiveness and *fertility*. He knew also from observation that the fertilizing quality of rain-water became immediately apparent by the increased vegetation of plants that followed. He had experienced the most beneficial results by the application of carbonate of lime, either as chalk, marl, chalk-clay, or lime to his land, and he knew that such practice had been established in his district long before Liebig wrote, or even existed. He knew from experience that manures were longer retained, and became more beneficial in their application to clay soils, than to those of a gravelly or silicious character, long antecedent to the discovery of Mr. Way. But it would be useless to pursue these observations further. In its true definition, theory is speculation, deep study or contemplation upon a subject, and in most cases a speculation as to the result ; but it no sooner becomes established as true, and becomes applicable and acted upon, than it is practice, and no longer theory. Practice therefore combines within itself all that which once had been theory ; and thus every generation avails itself of the discoveries that have been made by the preceding one. Individually one person may apply them sooner than another, and thus may have availed himself of the benefits that they confer. Such men are the pioneers in practice, which others from direct observation sooner or later avail themselves of ; and thus it is that new discoveries always require time to become developed, but when once set going, progress rapidly to ultimate and general adoption.

It is too much a fashion as regards agriculture, as it is in religion, for one class to imagine they are more highly gifted than another. The new lights think but little of the old ones their predecessors ; and although

the introduction of new discoveries in farming have done much, let it be understood that farmers are not so unmindful of their own interests as the former are willing to suppose. If we take a retrospective view of the progress of agriculture, we shall find that it has been progressive both in its practical application and development, and that the direct advantages are not obtained by knowing exactly how chemical or atmospheric agencies operate. Nature has so formed the human mind that but few individuals in proportion with the whole number that have existed, have been gifted as Liebig, Davy, Johnston, Faraday, or Way. It is the business of the mass of mankind to practically apply the discoveries of others, and to profit by them.

Within a few years it has become the province of theorists to abuse farmers, who in their estimation forsooth know but little ; while the little known is rarely practised. Let any one, however, travel throughout the county of Norfolk, and show the practical, experienced, and intelligent farmers of that county how to improve their system of cultivation. They adopt the four-field system as that best adapted to the soil, and consume their own grain and roots with additional expensive applications of oil-cake, which is never calculated upon becoming remunerative, except through the manure heap. They expend annually large sums in guano, superphosphate of lime, and artificial manures, for the production of their root and green crops, and are thereby enabled to apply the whole of their farmyard manure for the production of their grain crops. And the system is so perfect that the land becomes clear of weeds to such an extent as to challenge cultivation with the best managed gardens. The number of sheep and cattle that are annually fattened upon the arable farms would astonish even farmers of other districts. To an inquiry put by ourselves to a tenant farmer occupying 450 acres, of which upwards of 400 acres were arable, as to the number of sheep he kept, he briefly remarked forty scores ; and in another instance, upon an occupation of 1,000 acres, we found 80 scores, or 1,600 head of sheep, as ewes, hoggets, and lambs, upon his occupation. With such an application of skill and capital it will be seen that the ordinary production of the land has been doubled. Yet these are the cultivators who without adopting theories have accomplished such beneficial results ! Let us rather say that they are the men who have profited by experience of all kinds, without attending too much to that class, who “ rarely finish anything but their fortunes, or end anything but their lives.”

Rugged and care-worn as thou art, Practice, we say to thee, All hail ! Thy early hours of rising, thy days of universal toil and weariness, have all aided in the great work, and have assisted in converting the rugged mountains, the moory wastes, and the majestic forests of England, into one wide expanse of rich verdant meadows and highly cultivated fields ! while, aided by thy sister *Science*, thou affordest delight and health to those who read thy paths hand in hand together.



## AGRICULTURAL NOTIONS IN DORSET.

At the Blandford Agricultural Society's meeting, lately held, the chairman, Mr. G. STURT, M.P., in acknowledging the compliment paid him by the company in drinking his health, referred to the results of his observations on a continental tour from which he had just returned. He said—If ever man felt completely happy, I do at this present moment, and I think it is quite worth the while of any of the company to go abroad for some three or four months in order to experience, when he returns, the comforts and blessings of his native country. Two or three days before I started (as I am not in the habit of travelling with my eyes closed or my ears shut), I rode through Launceston farm, and I determined to carry it in my mind's eye, to compare it with what I saw abroad, and to see who had the best of it, and I can safely say my friend Jem Burgess came out triumphant on all occasions. At first I thought I might be a little prejudiced; but when I find that our average produce of wheat per acre is 4 qrs., whilst that of Germany, France, and Belgium is only 2½, and the value of our return is £3 5s., whilst theirs is only £1 15s., I cannot doubt that the advantage is on our side. But there are very few countries from which we cannot learn something, and one thing that we may learn from them is, I think, the construction and shape of their waggons. They appear to me to be all that is required—cheap and light. They cost one-fifth less, and carry one-third more weight than ours; and yet, with a team of two horses abreast, I saw them carrying positive stacks of corn over roads which we, in this country, would call hunting tracks. You have, at all events, an advantage over them. The condition of the Dorsetshire labourer is far superior to that of the German and Belgian peasant. I cannot conceive cottages worse under the canopy of heaven than what I saw; and when I found that their pay is only 10d. a-day; their food bread and (still worse) lard; that they have no roofs to their houses, and that they work fourteen hours a-day, I could not help thinking, What a fine field for the vivacious fancy, the fertile imagination, and the ready pen of our excellent neighbour, S. G. O. I But that must be, after all, matter of congratulation. The labourer is not only the bone and muscle, but the very prop and stay of your farms. I do not mean to say the state of the labouring population is perfect. I should like to see all landholders following the example of my excellent father, and building good and roomy cottages for the poor on their estates; and then, just to get their hands in, schools for the education of the poor. I believe, if that principle were more generally carried out, great good would accrue to the community at large. I believe you would see, in a short space of time, a great diminution in the catalogue of crime, and less call for your reformatories. I am convinced that the labouring man, taken as a class (of course there are black sheep in every flock), is honest, industrious, and sober; and surely it is but fair to give that man every possible chance. But to live in habitations unfit for animals, and scarcely for beasts, degrades him; he finds his home uncomfortable; he has recourse to the beer-house—those nests and nurseries of crime; from thence he gets to gaol: 'evil communications corrupt good manners,' and he goes on from bad to worse, until the man is lost. Surely it is a noble object to attempt to save one of our fellow-creatures. The same argument may be used with regard to schools. You will always find where ignorance prevails there does crime abound.

I am not one of those who think that it is necessary to study political economy, or Herschel on Astronomy, in these schools; but I do say that every man should be able to read his Bible, and to write to his friends. And I go a little further, and say until this is done, and not until it is done, is it in the power of the tenant farmer to improve the condition of his labourers. And even when it is done the tenant farmer must co-operate heartily with the landowner: without that, schools will become useless, and efforts to raise the condition of the labourer will fail in effect. It is due to the farmers of Dorset to say they will stand comparison with any others in their desire to do all in their power to ameliorate the condition of the labouring classes; and societies like this prove not only that they are ever jealous to assist their labourers, but that they are ever ready to bear willing evidence to worth and integrity. The pursuit of agriculture can now be said to a certain extent to be remunerative. This could not be said to be the case a few years ago, when I used to shake hands with the farmers in the hunting fields, and ask them how they liked being ruined. Those days are gone by. Persevering energy, whether supported by the applications of science or the skill of the farmer, is sure to succeed, and the farmer now gets a fair, and only a fair, return for his labour. This is the present position of affairs, and I hope with all my heart it will continue; but at the same time you would be blind to all the maxims of prudence if you relied on the continuance of present prices, or attempted to conceal the fact that the soil of this country is subjected to unrestricted competition. The second commodity of the farmer is taxed 100 per cent., and his tobacco is stopped at the Custom-house. Therefore it can only be by a continuance of your energy that you can hope to overcome your difficulties. I have no wish to frighten you by saying that corn is likely to go down to £8 a load again, but I am sure I am expressing the opinion of 99 farmers out of 100 when I say they would rather have corn at £14 or £15, than at one time £30, and at another time £8. The war is over, and, as the chairman of an agricultural meeting, I believe the proper, stereotyped thing for me to say is, that the sword has been beaten into ploughshares, and the bayonet into harrow spikes. But that is all my eye. There is no man more aware than I am of the advantages of peace; but the best way to maintain it is to be prepared for war, and I hope that the government will not listen to the Penny-come quick-me papers of Cobden and Bright, but will uphold the army and navy in an efficient state to maintain the dignity of the country throughout the universe. The hon. gentleman concluded by expressing the wish that this being the first year of his attendance at that dinner would not be also his last. He should now have an annual treat to look forward to, and an excellent opportunity of bidding them all—as he did now—a merry Christmas and a happy new year.

Mr. FARQUHARSON then gave the healths of the county members.

Mr. KER SEYMER, M.P., rose, amid cheers, and, after a few personal references, said—I think we are much indebted to Mr. Dauby Seymour for coming forward to give us two lines of railway, the completion of which will be of great value to this county. On this subject of railways I wish to say a few words on behalf of the class to which I belong. I hear it said, the landowners do not give to railways so much support

as they ought to do. Now they are placed in a different position to other people. The tradesman may, if he likes, have the railway made for him without giving it the least assistance; but I think he'd better not. I think he should put his hand in his pocket and take shares; but the case is not so with the landowner. He gets up one fine morning to find a gap cut through his hedges. "Hear, hear"—my honourable friend speaks feelingly. He sees a smart young gentleman, with others of another description, with flags, poles, theodolites, chains, and other alarming instruments for surveying his land, and all done under the operation of law. Well, of that I don't complain; in order to have railways you must have the preliminary survey. What comes next? He receives a circular, in which he finds a variety of schedules, and he has to enter himself either assent, dissent, or neuter; but he is told that he is to be subject to a departure from the ordinary law of property—a compulsory sale. Persons come to me with a sum of money. If I don't like that I must go before a jury of my country; and a jury of my country, being in favour of railways, don't give me a very high price for my land. I don't complain of that, but that is a very good answer why landowners don't do so much for railways as is expected of them. Take my own case. Lord Rivers very properly described these railways as all head and tail, and requiring to be connected. Well, if they are connected, the line will go through some land of mine. It does not matter whether I assent, dissent, or am neuter, the bill will pass, and the land will be taken; and I dare say you have found that when a person is called on to part with land, it is his favourite land—and although I am a supporter of the line, I'd rather they'd not go through my land; for I am sure no money that they can give me will compensate me for cutting through a very nice farm. Supposing a person comes to you, and wishes to purchase your favourite horse. You don't choose to sell it him; but you must. You do not like the price; then you must go before a jury, and take whatever they choose to give you. None of you would like it. Now, what is the moral of all this? It is this: if the landowner, in consequence of these things, is somewhat lax in his support of railways, it behoves those who are not affected by like considerations, if they wish a railway, to come forward liberally. I suppose it is now quite loss of time to talk about the advantages of a railway; but there are one or two points that should be kept in remembrance. Take the case of the agricultural labourer. Of all the privations he suffers under, there is none like the privation of fuel, and I believe that in this point alone a railway will be of immense benefit. I believe it will also be of great use to the farmer, who, the higher his cultivation is, and the more he employs artificial manures, will find the greater necessity for cheap transit and cheap fuel to keep his steam engine going, I have alluded to the conveyance of coal by railway, and the keeping of your steam engines and thrashing machines going, but I think there is something beyond that. You are all aware that some of the most energetic men in the country have been endeavouring to solve the problem of steam cultivation. They have not yet done it, but I know the energy of man, and I believe they will overcome it by producing, not perhaps a steam plough, but a steam cultivator; and should a practical implement be produced, there are many intelligent men in this room who will not be the last to avail themselves of its services. I know some persons view with alarm the introduction of this implement as affecting the condition of the labourer. I confess I do not; for the experience we have had since the introduction of the thrashing machine shows that improved machinery requires a higher class of labour—that the man who employs most machinery employs most labour

and a higher class of labour; and that steadiness, sobriety, and intelligence (which is what we and this society wish to reward) will receive by the introduction of improved machinery the reward of high wages. We have been so often misled in our anticipations of particular subjects that we are afraid to prognosticate. When railways were first introduced many said (I believe I said myself), what is to become of the grower of oats and the breeder of horses? The whole country, except Dorsetshire, is now covered with a net-work of railways, and yet I have not found for many years past either horses or oats too cheap. I think labour will not become too cheap by the introduction of machinery; but should any temporary inconvenience arise during the change, I am quite sure we all—landlords and tenants—will unite and do our utmost to avert any sufferings which may be caused to the poorer classes. And now I am coming to agricultural statistics (applause). I told you last year I saw no reason for any compulsory measure with reference to this subject. I think the time has been let slip by, for compulsory agricultural statistics. Some years ago, when the legislature, for the benefit of the British agriculturist, imposed a certain duty upon foreign corn—an act which to a certain extent excluded it—it might perhaps have been justified in saying "we have excluded other countries for your benefit, tell us what you are doing at home to feed the people." But now we are told the consumer must look out for the cheapest market. Well, we are not bound to assist him. He must look out for himself. I think there was very naturally an objection to the bill of last year, and that a feeling was raised throughout the country, and brought to bear on the question, by which the cause of agricultural statistics, if a good one, has certainly been thrown back many years. It has been connected with all sorts of schedules, poor law machinery, fines, and a great deal that is very disagreeable to the British farmer; and let me tell you, Mr. Hall Maxwell stated, in his evidence before the House of Lords, that if the Scotch farmers were subject to any compulsory measure, their hacks would be up directly. It appears to me there are two distinct questions—the one, whether there shall be compulsory statistics; the other, whether there shall be any statistics at all. I, as your representative, never will force on you compulsory statistics. Now the Government were rather cunning in one respect with regard to this question. They brought it in the House of Lords, being very probably aware that Lord Derby, who is allowed to be the leader of the Conservative party, had no objection to it, and did not intend to oppose it. In fact, he did not oppose it, and they, no doubt, thought the county members would follow in his wake. But allow me to say the county members are men of independent position, and they are not prepared to follow Lord Derby, or anybody else, in opposition to the feelings of the great agricultural community, and therefore Government, thinking to steal a march upon us, found that they had been mistaken. I consider the less importance to attach to the question, for I find that what you can get accurately is so little that it is not worth a compulsory measure. I will not conceal from you that I am one of those who think if you could get from any machinery of your own accurate returns of the growth of corn immediately after harvest, it would be valuable; but I am afraid you can't get it; and if you think you have got it, and it turns out to be inaccurate, you are worse off than before. Therefore, I should say, at all events, there is no hurry about this. We have scrambled on for a great number of years. Let us test, if we can, the accuracy of the Scotch returns, which are now very full; let us test them, and see whether we can attain to that which we think desirable—if we can obtain it. Some think it undesirable, because, as a tenant-farmer said to me, "Specula-

tion is the soul of business." I confess I do not agree with this; I think certainty—if you can get it—is the soul of business. The Scotch have shown their national character; they entirely avoided all compulsory measures. 1,000 tenant-farmers were engaged in collecting the Scotch statistics, but they took care to get several thousand pounds of our money for it. Now, if we are to do it, I should propose that it should be done—but after full discussion and with the free consent of the agricultural body—by our own machinery, and let Government pay us for it. The London Farmers' Club met last year, and passed a very judicious resolution in favour of agricultural statistics. In a general way they thought it a good thing; and many persons think it so far good, that you may get accurate returns of the land under crops without much difficulty. That would be an advantage; and, recollect, the fact is, after all, we are always talking agricultural statistics without knowing it. Your chairman told you that we grew 4 quarters an acre, and the Belgians and Germans only  $2\frac{1}{2}$ : that's agricul-

tural statistics—I don't know whether accurate or not. I quite agree in this—that it is not a question that ought to be forced on us, or in which we ought to have the interference of Government. Some think the Scotch were so ready in this matter because they had got nineteen years' leases. All of you may have them if you like—that is to say, you have only to make up your minds not to look at a farm with less than a nineteen years' lease, and you will have it; but you all know that if any landlord wishes to take an advantage of the tenant, he and the steward will do it in five minutes. Well, gentlemen, I have done. I have not used language as a mode of concealing my thoughts. Depend upon it, you will never be injured by me with regard to agricultural statistics. If you adopt them, I believe you will find at the end of the year you will neither be richer nor poorer than you were before. It has been a long story, but I promised to have it out. I have now only to thank you for the patience with which you have heard me—to drink all your good healths, and wish you a happy new year.

### THE SEWAGE OF LONDON.

In a recent number of this Journal we endeavoured to urge the claims of agriculture, in the disposal of the sewage of the metropolis and other populous places; claims which are evidently little regarded by the Commissioners who usually direct the affairs of our metropolitan sewers. Their ideas, as far as we can decipher them amid the flood of words in which they are overwhelmed, are simply confined to finding an exit for the sewage of London at as short a distance down the Thames as they can be allowed to select. The ludicrous way in which their puny attempts have been baffled would, in a less serious question, excite our ridicule: driven from Deptford down to Woolwich Marshes, ordered by the Government authorities to go still farther from home; then selecting Erith Marshes; opposed by the constituted authorities, and condemned by Sir Benjamin Hall in every case; and evidently able to prove to the public only the simple fact of the utter failure of the abortive effort to constitute a working Board out of such absurd materials as now, once or twice a week, are collected in the Council Chamber at Guildhall.

Amid the dead lock to which these everlastingly-talking personages have arrived, it was refreshing to notice that one man (not of the Board) was able to grapple with the sewage in which the aforesaid Commissioners are so hopelessly immersed; that Sir S. M. Peto—a practical person, and of undoubted ability and means to accomplish so gigantic a work—not only showed to the wise London Board one way in which at least the sewage of the great northern portion of the metropolis might be conveyed direct into the sea, but he further offered to execute the work. He even—(evidently being aware of the insufferable tediousness of those he had to deal with)—he even at his own expense has given the requisite parliamentary notices, so that an act of parliament to authorize the

execution of the work may be procured in the approaching session.

By this plan the sewage of London would be conveyed direct from the eastern side of the metropolis into the upper portion of the valley of the river Crouch, a few miles from Brentwood, in Essex, and thence, in an appropriate sewer, down the valley of that little river into the German Ocean. By this plan two very important objects would be attained: no portion of the Thames would be polluted by the discharge into it of the London sewage; and, again, by Sir S. M. Peto's plan, the great trunk sewer leading to the sea would traverse, for by far the greatest portion of its course, a long extent of meadow-pasture and marsh land, of all others the best adapted to render available in irrigation the huge stream of manure now worse than wasted in the very waters our Londoners are compelled to drink. No farmer who read Sir S. M. Peto's proposal doubted that the value of the sewage was much too well known to render it at all probable that any of this liquid manure would be allowed by the farmers of the district through which it passed to reach the sea; it would, when employed on their grass lands, be purified of every noxious matter long before its cleared water finally was allowed to drain away into the river Crouch. We repeat it was to us, as it was to others, refreshing to read these things. We were anxious to learn what "the Board" would say to it, how they would treat the common-sense request of Sir S. M. Peto to be allowed to wait upon their profound wisdoms, accompanied by Mr. Maclean, his engineer, to explain his plan. Gentle reader, you will perhaps deem that modest request of a kind to which only one reply could be given by any body of men having any pretensions to common sense, or a love of fair dealing—a request, be it remembered, emanating from a man of acknowledged talent, and far better acquainted with works of

this description than any member of that Board to whom his application was made. But no; by a very large majority, the Board gravely determined that Sir S. Peto *should not be even heard!*

Reader, as you sit by your own warm fireside, and reflect upon the drainage of the houses inhabited by

3,000,000 of persons now thus wisely *superintended!* thank God that the affairs of your own rural parishes are not thus regulated, and that in the choice of *your* public officers it is not yet your custom to select those who can talk, and *only* talk.

## A FARMER AMONG THE CHEMISTS.

### LETTER I.

MY DEAR BERZELIUS,—You remember how we used to crack retorts and half-ruin the laboratory for glass tube and crucibles; how we frightened the professors with explosive mixtures, or stifled them with chlorine and the fragrant sulphuretted; and how you laughed at my bungling soil-analyses, in which I always got too much lime, and could never separate the iron and alumina. Well, since leaving college I have been busy with quite different pursuits, so that the stoppers are safely tied-down upon all my chemistry. However, your advice to “read” well on the subject has not been neglected; and your late discussion with old Blowpipe on the nutrition of plants has re-awakened in me a determination to know what truths you *savans* have really discovered that may be of practical use to the farmer—of use, I mean, in developing or revolutionizing the present systems of agriculture, and giving us new principles on which to build our entire practice. In the mere “art” of husbandry, as distinguished from its “science,” of course I find many pecuniary advantages resulting from your labours. You protect me against fraudulent dealers; instruct me in the value of marls and limes; advise me as to the best admixtures of feeding-stuffs for cattle-fattening or dairying; direct me how to manage farm-manure most economically; and in a multitude of other ways render me your debtor. You have introduced more *improvements*, however, than actually new practices; and I am afraid that the late Mr. Pusey’s celebrated sentence, delivered six years ago, still remains just and undeniable. “Except Liebig’s suggestion for dissolving bones with acid, and Sir Robert Kane’s for using flax-water as manure, I know of no agricultural *process* arising out of chemical discovery.” But this may be owing to a lack of inventive faculty among us farmers; for it is undoubtedly our business, not yours, to perceive and appropriate anything in your discoveries likely to assist our art. The chemical philosopher, indeed, searching after the natural laws of fertility in soil and the nutrition of vegetables and animals, cares no more for an offshoot suggestion like bone-dissolving than he does (as Dr. Playfair say-) for “a recipe for Warren’s blacking.”

You will smile when you hear that I am perusing the works of our great agricultural chemists, together with the essays and articles which are periodically served-up as scientific aliment for the farmer’s intellectual appetite; that I am carefully studying both recorded experiments and controversies respecting them, in the hope of learning what are the fundamental principles from which may

be deduced rules for cultivating and manuring; because you know that instead of complete satisfactory enlightenment, I am meeting with too much insufficient proof, irreconcilable discrepancy, flat contradiction, and, in general, either attempts to deal with soils and living organisms by rules obtained from the manipulation of substances in bottles and dishes, or else wholesale generalizations from the few experiments which have been conducted in the natural fields. Do not think for a moment that I would slight the researches that have been made in organic chemistry, or understand me as speaking lightly of the wonderful discoveries you chemists have brought to bear with the greatest success upon some points of husbandry; but is it not true that, notwithstanding the accumulation of masses of facts obtained by the most ingenious and refined methods of analysis, your efforts to get at *the secrets of fertility* are as yet far from attaining the success you desire? You admit that a true “theory of agriculture” can only be established after the farmer’s practice—embodying the rough practical conclusions of instinct, experience, and the “rule of thumb”—has been thoroughly investigated and explained; and, as far as I have found at present, nobody has yet cleared-up the mysteries involved in even the single item of “rotation of crops.” Again, as to the food of a plant, you can separate and weigh its component parts, discriminate and determine the kinds and proportions of its mineral and aerial constituents—and this is a great step made of late years in agricultural science; but you do not tell me confidently, and with ample proof, how and whence the plant directly obtained the various ingredients. The fact is, you are only just beginning to experiment upon the point in a proper and adequate manner—that is, by first ascertaining what description and amount of the plant-constituents exist in a soil, gauging all that are brought into it from the atmosphere or applied as manure, delicately testing all that are lost from the soil by evaporation, drainage, &c., and then examining the quantities fixed in the crop. By thus keeping a sort of debtor-and-creditor account, might you not discover what substances crops take directly from the air, what from the soil, what from one through the agency of the other, what they may give to the soil, and what they may dispel from it into the atmosphere? It appears to me that the most valuable results in the chemistry of cultivation have been hitherto procured by applying plant-food to the land, measuring the quantities naturally supplied, at the same time accurately allowing for waste in all forms, and then ascertaining the effects present in the

crop ; in short, I am inclined to think that you can best help the farmer by a *synthetic* rather than an analytic course of experiments. But do not be in a hurry to deduce and infer and generalize, while so many conditions and circumstances may be as yet unrecognized and unaccounted for.

My next letter shall give you an example of the kind of answer I often get to my inquiries, and of the opposing statements and confident opinions of scientific instructors upon one of the most momentous points in agricultural chemistry, viz., the sources of nitrogen in plants. But as I purpose to afflict you with a series of epistles, it is advisable for me to set forth their scope and object as far as at present determined upon.

Take, first, the Liebig and Lawes discussion, in which voluminous efforts of rhetoric and reasoning have gathered around the nucleus of a few facts. If the facts on both sides are fairly stated, the inference of right conclusions from them becomes a matter of logic rather than of chemical knowledge ; and I, as a farmer, may be as well able to judge the soundness of the argumentative steps when lucidly placed before me as you, a chemist, more deeply conversant with the facts in dispute. In truth, I really begin to surmise that both parties have so entangled themselves in technicalities, and confused the world with quotations and misquotations of personal opinions, that it is time for some plain common-sense body to come in, and, hearing clear explanations from each side, discriminate and sum-up like a lawyer on a scientific case, "according to the evidence."

Then, as to the works and publications with which the agricultural public has been furnished, even my little reading has sufficed to find in them utterly contradictory theories propounded and fortified with facts by different men of eminence, yet each apparently established without allowing for the circumstance that the very opposite conclusion has been arrived at by another mind, and sometimes from precisely the same experiments. Now, in such cases, I want one author to allow for the diverse teaching of another ; and I intend to quote to you a number of principles and opinions laid down by different writers, just adding to each a proviso or qualification taken from some other perhaps equally reliable authority. You know what marvellous light Kant let in upon metaphysics by his critical philosophy. Well, in an infinitely humbler degree, but on the same principle of action, may not one, looking at the questions now agitated in the chemical world from a practical business-point of view, introduce a little order ; and by putting a few home questions to any person making assertions inadequately supported, by demurring to wholesale inferences, confronting assumptions with their contraries, or collating one author with another or even with himself, gradually gain some clearer view of the foundation principles for which we have so long been vainly searching ? My presumption is not bold enough to attempt such a great work of criticism, but still I may exemplify in my letters the kind of treatment I should like to see adopted by some mind more equal to the task. Neither would you suffer me to teach you chemistry, any more than I would accept your views of my turnip-land man-

agement at C—, or your advice about my shorthorns and flock bred in-and-in without deterioration, in spite of all the books. But I mean to quarrel with all your favourite authors, if I find them ignoring what has been suggested by one another ; and I will ask all manner of questions, and propose solutions of my own for your investigation and study, whenever I am able to do so.

And now look for plenty of "nitrogen" in my next.

Yours &c.,

J. A. C.

## LETTER II.

MY DEAR BERZELIUS,—How does nitrogen get into plants ? If (as Liebig teaches) all vegetables ultimately obtain this constituent from the atmosphere, and if (as Mr. Lawes says) some cultivated crops may be characterised as collectors of nitrogen from the air, while others dispel it from the soil, it seems to me highly important for the farmer to know, not only whether this aerial food—either as gas, or in a solution, or in combination with other elements—enters into all growing plants, or, if into some only, which these favoured recipients are ; but also to know with certainty if it passes in through the *leaves* or *roots*, or in what proportions through both these organs in different species of plants. The importance of such a piece of knowledge I may insist on by-and-bye ; at present my object is to show how loose and unsatisfactory, nay even contradictory, is the instruction of our authorities on the subject. It has been triumphantly demonstrated, over and over again, that more nitrogen may be removed from a field in the produce of successive years, than can be accounted for by the amount supplied in manure, or already existing in the soil ; the inevitable inference being, that the surplus must have been furnished by the atmosphere. And to guide my system of manuring and rotation of cropping, it is of course a great advantage for me to know that during the growth of at least some crops, this expensive element, in some form or other, is spontaneously accumulated in my land. But beyond this point, I want to know whether the soil be the caterer that first of all abstracts it from the air, and transmits it to the crop (either by presenting it to the roots, or exhaling it around the stems and leaves), or whether the plants themselves feed directly upon the atmospheric nourishment ; or if I wish to learn to what relative extent both these acquisitive functions may be operative in the growth of different vegetables. You tell me that all ordinary plants absorb and inhale nutriment by their roots and leaves ; that therefore my practice should be to enrich and open the soil for the searching of the roots, and provide ample space for the spread of the leaves ; and if I have a plant more or less greedy in the soil, or independent and abstinent of its stores than another, I must regulate my manuring and root or leaf feeding accordingly. But I should like a little information less general than this : let me know precisely whether my endeavours after better cultivation of any particular crop ought to be concentrated upon the texture and richness of my soil, or upon the various conditions of growth above-ground, and then I shall the sooner grasp the improvements I am in search of. Nobody has

any doubt that all our cultivated plants both absorb by their roots and procure by their leaves nitrogen in some form; and I have a rough conclusion as to which kind of crop employs its foliage to most advantage: but give me reliable data as to conditions and quantities before you propound to me a "theory of agriculture," and before my practice can march with wished-for rapidity.

I have circumstantial evidence that nitrogen, in the form of ammonia, may enter into roots; for it exists in solution in rain-water, some portion of which (one would think) must reach the spongioles of roots, before coming in contact with any fierce constituent in the soil that might seize all the ammonia, or subject it to chemical change; and these spongioles being proved (according to Dr. Lindley) to be indiscriminate feeders, will imbibe the ammonia as well as other ingredients. However, I would not too hastily conclude that roots take up everything which can be found in rain-water, for the simple reason that, having to filter its way to the roots through a mass of earth alive with chemical agents, the water may just possibly be robbed of its burden before reaching them. I hardly dare apply similar reasoning to the case of leaves, because instead of being omnivorous feeders, there is clear proof that they choose one gas and reject another, and do not inhale all the constituents of the atmosphere in the proportionate quantities which are presented to their surface. So that, though leaves abstract carbonic acid from the air, they may not choose to take in volatile ammonia. But ammonia is dissolved in the rain that wets foliage; and as it is certain that leaves absorb moisture, it is exceedingly likely that ammonia goes in with it. Experimental proof I have none, and turn therefore to the information which, as an unlearned farmer, I find published for my use.

Sir Humphrey Davy says: "The effects of azote in vegetation are not distinctly known. As it is found in some of the products of vegetation, it may be absorbed by certain plants from the atmosphere." Dr. Fownes, in the Royal Agricultural Society's *Journal* for 1843, concludes, from the experiment of Boussingault and other considerations, that the excess of nitrogen gained in a course of cropping must have been "taken up from the air;" and, in his "Actonian Essay" of 1844, he says: "Adult plants get their nitrogen from the little ammoniacal vapour which exists in the air." Does this mean by the agency of their leaves, or by their roots taking advantage of, and promoting, the absorptive faculty of the soil? Liebig gives very little information on this particular subject; indeed, I am unable to gather (at any rate, from my edition of his work) what his opinion really is. He says that plants obtain ammonia "either by their leaves or roots," sometimes insisting on the value of this substance as food for roots, and at other times inclining to regard leaves as its principal appropriators. In one place he computes the quantity

of ammonia in the atmosphere, in proportion to carbonic acid, from the relative amounts of carbon and ammonia existing in the plants of a natural, unmanured meadow, obviously assuming that the ammonia is absorbed just as carbonic acid is, and at the same rate; and this gas, I believe, is known to enter more by the leaves than by the roots. But the subject is passed over as being of comparatively small importance. Our scientific agriculturist, Mr. Lawes, distinguishes between "nitrogen-consuming" and "nitrogen-collecting" plants; but only in relation to the necessity for this constituent, or else its superfluity, in manures for different crops. He brings forward no good evidence to show whether the "collectors" borrow from the atmosphere through the medium of the soil, or draw in the supply directly by the leaf. In the Royal Agricultural Society's *Journals*, he speaks of a sandy soil acquiring nitrogen "by the free circulation of air through its pores, and by the accumulation from the resources of the atmosphere, through the medium of green crops." Again, for obtaining ammonia from the air "upon light soils; nothing can advantageously substitute the collective powers of the turnip." Again: "By cultivating turnips and the leguminous plants, a large amount of ammonia is collected by them from the atmosphere." Again: "As the amount of this substance obtained by green crops must depend very much upon their bulk, every attention should be paid to their growth." And again: "Relatively to wheat and many other plants, the turnip exhibits a large surface of succulent leaf, which, it is admitted, indicates a greater reliance in one way or other upon the atmosphere." His opinion would seem to be that leaves as well as roots, at least in some kinds of vegetation, absorb ammonia; but no adequate and substantiating proofs are forthcoming, his great experiments having had other objects in contemplation.

Professor Johnston, in his "Chemistry of Common Life," says that "ammonia and nitric acid exist and are formed in the soil; and from the soil these and other substances containing nitrogen are taken up by the roots of plants;" and he also asserts that "the pores of the leaf absorb carbonic acid and also other gaseous substances in smaller quantity—such as ammonia, when it happens to approach them." But in the "Encyclopedia Britannica" (Art. "Agricultural Chemistry"), I am told that "the absorption of ammonia, so far as we know, takes place *entirely by the roots*; and although a quantity of it no doubt exists in the air, which is important to the plant, there is little doubt that even that reaches it through the root, being carried down by the rain, and absorbed in that way. The greater part of the ammonia, being derived from the organic matter of the soil, is undoubtedly absorbed by the roots."

And now I must leave a further arraignment of authorities for my next communication.

Yours, &c.,

J. A. C.

## HEXHAM FARMERS' CLUB.—PATTERN FARMING LEASE.

A numerously attended meeting of this club took place in the club-room, Hexham, for the purpose of receiving a report from a committee appointed for the purpose of drawing up a pattern farming lease upon the most equitable principles to both landlord and tenant. John Gray, Esq., of Dilston, the president of the club, officiated as chairman.

The SECRETARY said that, at their last meeting, a silver cup or premium of £7 having been offered for the best 20 acres of turnips, he thought the meeting should determine at what time the examination should take place. It was finally agreed that the middle of November would be the best time, and that the entries for competitors should close on the first Tuesday of that month.

The CHAIRMAN then called upon Mr. Dodds to read the report and pattern lease, which had been drawn up.

Mr. DODDS said, before proceeding to read the report and lease, he thought it necessary to state that, with regard to one or two clauses, a difference of opinion prevailed among the members of the committee. He then read the report as follows:—

“At Hexham, on the 14th day of October, 1856, in a meeting of the committee appointed in reference to leases by the Hexham Farmers' Club, at their meeting on the 29th April, 1856; present, Messrs. Mark Spraggon, Joseph Lee, William Trotter, and Thomas P. Dodds; Mr. Dodds in the chair; the committee having had several previous meetings in regard to the subject referred to them, have this day agreed to the following report:—

“Your committee, in performing the duty assigned to them by the club, have thought it better to frame a form of *lease* rather than of a mere agreement, and, in doing so, have borne in mind that, by the terms of their appointment, they were to have regard to the interests of both landlords and tenants. They have endeavoured so to frame the lease that while the tenant will be free to keep pace with every improvement in agriculture, he will be prevented, in as far as a lease can do so, from running out or deteriorating the farm. Thus, by the cropping clause, while he is prevented from taking two white crops in succession, or from growing more than a fixed quantity of potatoes, without an outlay in purchased manure, he may by such outlay grow as wide a breadth as he chooses. He will also be at liberty to curtail his grass to a certain extent, so as to take a pulse or other crop in

lieu of it, and thus prevent his land becoming ‘cloversick.’

“Your committee think it right that, in the concluding years of a lease, the tenant should confirm for a stipulated rotation, so that he may not have more than a fair share of the farm for an away-going crop, and that the incoming tenant may have a fair portion of grass and fallow to enter to; and for this the committee have provided, that rotation may be either a four, five, or such other course as may be agreed upon by the parties. For good land on Tyneside your committee are unanimously of opinion that a four-course rotation, with liberty to substitute a pulse crop for a portion of the grass when required, is the most profitable; but many of the farms in this district include poor as well as rich soils, and it is evident that on the lighter portions of such farms a less exhausting rotation, such as the five or six course, ought to be followed. What that rotation is to be will be determined according to the nature of the farm, and by the parties interested.

“With these remarks your committee beg to submit the following form of lease, not, indeed, as being either perfect in itself, or applicable in all cases, but as one which, while it gives the tenant security in the outlay of his capital, secures the landlord from having his farm deteriorated.

“In name and by authority of the committee,  
T. P. DODDS, Chairman.”

This indenture, made the . . . . . day of . . . . . one thousand eight hundred and fifty . . . . . between A. B., of . . . . . in the county of Northumberland, Esquire (who with his heirs and assigns are comprised in the expression “the landlord” when the same is hereinafter used), of the one part, and C. D., of . . . . . in the county of . . . . . (who with his executors and administrators only are comprised in the expression “the tenant” when the same is hereinafter used), of the other part—witnesseth that in consideration of the rents hereinafter reserved, and the covenants hereinafter contained on the tenant's part, to be observed and performed, the said A. B. doth demise to said C. D. all that farm called E. F. in the parish of . . . . . in the county of Northumberland, containing . . . . . acres or thereabouts.

Except all mines, minerals and quarries, in and under the said farm, with liberty to work, win, and carry away the same, and to sink shafts, and erect all buildings necessary thereto, the landlord making

compensation for all damage to be done by the exercise of such liberties, and the amount of such compensation in case of dispute to be settled by arbitration as hereinafter provided. And also except all woods, underwoods, trees, and plantations, upon the said farm, with liberty to prune, cut, bark, and carry away the same, and to form all works necessary thereto; and also power at any time to take any part of the said farm for roads, the landlord to make compensation for all damage to be done by the exercise of such liberties, and the amount of such compensation, in case of dispute, to be settled by arbitration as hereinafter provided. And also power to strengthen boundary fences with neighbouring proprietors of farms, the tenant receiving such deduction from or paying such addition to his rent as shall be fixed by arbitration as hereinafter provided. And also except liberty for the landlord, or those authorised by him, to enter upon, and hunt and shoot over the said farm, the tenant also having liberty to hunt and shoot over the said demised lands.

NOTE.—If the farm is situated in the vicinity of the landlord's residence, and the game is to be absolutely reserved, the preceding clause will be omitted, and the following substituted instead.

And also except the game upon the said farm, with power to the landlord, or those authorised by him, to hunt and shoot over the said farm, the landlord making compensation for all damage to be done either by the said game, or by parties preserving or in pursuit of the same, and the amount of such compensation to be fixed by arbitration, as hereinafter provided.

To have and to hold the said farm, except as aforesaid, unto the said C. D., his executors and administrators, from the thirteenth day of May, one thousand eight hundred and fifty . . . ., for the term of . . . . years, yielding and paying therefore unto the said A. B., his heirs and assigns, the yearly rent of £. . . ., at such place as the landlord or his agent shall from time to time direct, by equal payments, on the eleventh day of November, and thirteenth day of May, in every year, the first payment thereof to be made on the . . . . day of . . . ., one thousand eight hundred and fifty . . . . And, also, the further rent of ten pounds for every acre cropped contrary to the course of husbandry hereinafter provided; and a further rent of five pounds for every ton of turnips, mangold, straw, or hay, which shall be carried away from the said farm, unless purchased manure to the value of one pound for every ton of turnips or mangold, and of two pounds for every ton of straw or hay so carried away [the tenant being bound to give due notice to the landlord or his agent of his intention so to dis-

pose of any turnips, mangold, straw, or hay, and to produce vouchers of the purchase of the said manures] be applied to the said farm within the year immediately following such sale, provided always that the said last-mentioned rents shall be payable only for the year in which they are incurred, and must be claimed within twelve months after the same shall become due. [Excepting the case of penalties incurred for ploughing up old grass lands, when they shall be payable from the time they are incurred, and continue yearly during the term].

And the said C. D. doth, for himself, his executors and administrators, covenant with the said A. B. and his heirs and assigns, in manner following, that is to say, the tenant will, during the said term, pay the rents hereby reserved, at the times and in the manner herein appointed for payment thereof; and will, during the said term, pay all taxes and assessments which shall be payable in respect of the said farm. [The landlord's property tax, rent charge in lieu of tithe, and land tax excepted.]

The tenant shall keep and leave in permanent grass the following fields, viz.: . . . . . And shall, during the said term, cultivate the remainder of the land according to the rules of good husbandry, and, in particular, he shall not at any time take two white crops in succession, nor have less than one-fifth part of the said land in grass, nor more than . . . . . acres in any one year under potatoes without applying to the said farm within the following year purchased manure to the value of eight pounds for every additional acre under potatoes; and during the last four years of the term he shall not have more than . . . . . acres under corn; or . . . . . acres under peas, beans, or tares; nor shall he have less than . . . . . acres under one-year-old grass; . . . . . acres under two or more years-old grass; and . . . . . acres of fallow or fallow crop [without leave in writing from the landlord or his agent for the time.]

The tenant shall keep and leave in good and sufficient tenable condition and repair the whole buildings which are now, or may hereafter during the term be, upon the said farm, with the exception of the main walls, main timbers, and floors. [The tenant shall insure and keep insured, during the term, those parts of the buildings which, by the preceding clause, he is bound to uphold, in the sum of £. . . . . in some established insurance office, in the landlord's name, and in the event of his not doing so, the landlord is hereby empowered to insure the same, at the expense of the tenant.]

The tenant shall keep and leave in good fencible condition and repair the whole fences, ditches, and gates which are now, or may hereafter during the



term be, upon the said farm, the landlord supplying the wood for the said gates. [And should the tenant at any time neglect to make the repairs which he is hereby required to perform, the landlord, after one month's notice, is hereby empowered to complete the same, and the amount expended by him in so doing shall be recoverable as rent.]

The tenant shall keep trained or uneaten after the first day of October preceding the expiry of the term . . . . . acres of the best land sown with clover or grass seeds in the last fifteen months of the term, the same to be pointed out by the landlord or incoming tenant, for which seeds he shall receive payment from the landlord or incoming tenant.

And it is further declared and agreed as follows, that is to say:—The tenant shall, before the thirty-first day of December preceding his removal, plough, in a good and workmanlike manner, all the land which falls to be fallow in the following year, for which ploughing he shall be paid by the landlord or incoming tenant, according to a valuation made as hereinafter provided.

The tenant shall cart out, at proper seasons, into such fields as the landlord or incoming tenant shall direct, the whole dung made on the farm during the last six months of the term, for which labour and one-half the value of which dung the tenant shall be paid by the landlord or incoming tenant, according to a valuation made as hereinafter provided.

The tenant shall be allowed an away-going crop from the land, which, according to the course of husbandry hereinbefore provided, shall come in course for corn crop in the last year of the term, which away-going crop he shall be bound to sell, and the landlord or incoming tenant shall be bound to purchase, at a valuation to be made as hereinafter provided.

The landlord or incoming tenant shall have power to sow with grass seeds such parts of the away-going crop as they shall see fit, and which seeds the tenant shall be bound to harrow or roll in, he being paid for the same according to a valuation made as hereinafter provided.

The thrashing and grinding-mills on the farm to be kept in good working order, and so left by the tenant to the landlord or incoming tenant, and to be paid for according to a valuation made as hereinafter provided.

The tenant to be paid for the following unexhausted improvements at the end of the term, viz. For lime applied to the land with the sanction of the landlord within the last year of the term, the whole cost price at the kiln; in the second year previous to the termination, two-thirds of the said cost price; and in the third year, one-third of the

said cost price. For undissolved bones applied in the last year of the term, one-half of the cost price; and in the second year previous to the termination, one-quarter of the said cost price. For guano or other approved manure applied to the away-going crop by the out-going tenant, one-third of the cost price.

All valuations to be made, and all matters herein directed to be settled by arbitration, to be made and settled by two neutral parties mutually chosen; and in the event of their differing in opinion, the matters regarding which they so differ shall be settled by an oversman to be appointed by them, whose decision shall be final.

In witness whereof the said parties to these presents have hereto set their hands and seals the day and year hereinbefore written.

Signed, sealed, and delivered, by the within named, in the presence of . . . . .

After the lease had been read, the clauses were discussed separately.

On the reading of the clause relative to the right of the tenant to kill game on his own farm, considerable discussion ensued.

Mr. DODDS said that the committee thought that the clause which he had read ought to remain in the lease. They had prepared another clause which, if landlords absolutely wished to reserve the game for their own use, ought to be substituted. After reading the other clause, Mr. Dodds said the view which he took of the question was perhaps erroneous, but they all knew that landlords were very chary of the right of preserving game; but if a lease were introduced to please both parties, they should try to give offence to none.

The CHAIRMAN said, that with reference to cases where a tenant was a sportsman, the landlord would have to bear all the expense of watching, &c., and the tenant, although having a right to shoot, would have nothing to pay. On Earl Grey's extensive estates in that county, the shooting during the first month was reserved, and after the first of September the tenants were at liberty to do as they pleased. But it was hardly to be expected that the landlord should preserve the game, and let the tenant have the benefit of it. He quite agreed with the last clause, that where damage had been done by persons in pursuit of game, compensation was due to the tenant.

Mr. TROTTER said that Mr. Dodds had proposed to give the tenant compensation for damage done by game, but it was almost impossible to do so; for the seed was no sooner deposited in the ground, than pheasants began to eat it, and when it commenced to sprout, the hares again attacked it. Besides, farmers were very much exposed to trespasses. Fences might be broken down by persons

in pursuit of game, and through these broken fences cattle might stray among their corn; yet how could a tenant ask his landlord for damage caused by his own cows getting amongst his own corn? He moved an amendment that the first clause should remain, and the second should be withdrawn.

Mr. DODDS deprecated entering into any discussion of the game laws at the present time. They must make the best of the law as it at present stood. He thought the second clause would be beneficial to both landlord and tenant.

Mr. COOKE agreed with Mr. Dodds in the propriety of taking the law as it stood, but by that law the game was the property of the tenant.

Mr. GEORGE LEE thought both clauses were of very great advantage to the tenant.

The CHAIRMAN said he could not agree with Mr. Lee. He had no liking for the game laws, but as a matter of policy they must reconcile themselves to the present state of the law. If they had a clause in the lease by which tenants were to have the power to destroy game, did they imagine that the landlord would be induced to live in the country and preserve the game, when he was deprived of his sport?

Mr. TROTTER said that a great deal of damage was done to the crops by game; but it was kept, not so much to please the landlords, but rather the gamekeepers and the class who ran after them. Where game was preserved, it was more at the mercy of the tenant than of the landlord, because the tenant could easily destroy the eggs of the birds. [A member inquired: Would that be an honest proceeding?] He thought, however, the matter could be so arranged that the landlord should reserve the right of shooting the birds, and the tenant the right of shooting hares, &c.

On Mr. LEE'S motion (that both clauses stand in the lease) being put to the meeting, 16 hands were held up. For Mr. Trotter's motion (that the tenant have an equal right with the landlord to kill game), five members voted. The motion that the second clause should stand, and not the first, was lost.

The next clause discussed related to the imposition of a penalty of £10 for every acre of land cropped contrary to the covenant, and a further penalty of £5 for every ton of turnips, mangold, hay, or straw carried away from the farm, unless manure in certain proportion was purchased and applied to the land.

On this clause being read,

Mr. GEORGE LEE said the tenant ought to have leave from the landlord to remove hay or straw.

The CHAIRMAN agreed with Mr. Lee that great injustice might be done by the tenant removing

hay or straw without his landlord's knowledge. Notice should be given by the tenant to the landlord.

Mr. DODDS expressed his concurrence with the chairman's remarks.

The CHAIRMAN said that the landlord should not only know when straw had been sold, but also that manure had been purchased. He also suggested that the words "without notice" should be inserted in the first part of the clause.

It appearing to be the unanimous opinion of the meeting, that notice should be given to the landlord, Mr. Dodds was requested to make an insertion in the lease to that effect.

On the clause being read relative to the culture of the land,

The CHAIRMAN said he thought £5 an acre was a very unequal penalty for mismanagement in certain instances. It might be a full and ample penalty for selling hay and straw without purchasing manure with the money received; but it was very inadequate for miscropping and mismanagement. What damage was a landlord to receive for an old grass field being ploughed out? If a penalty were inflicted at all, it ought to meet the object for which it was intended, or else it would be of no use. If a penalty of £20 or £50 were inflicted, it was of no consequence to the man who did not intend to take any advantage; but, in other cases, a penalty of £5 was not heavy enough. His experience in that matter had taught him to look for penalties from people who, for instance, thought to grow quantities of turnip-seed without leave in writing. That originated from a very wrong-headed tenant of his leaving a crop of turnips to grow to seed at the end of his lease, which ought to have been used by the in-coming tenant. Many years would elapse before that field could be restored to its original state. From that circumstance a great deal of litigation had ensued, and the man had to pay £300 for his dishonesty. He (Mr. Gray) put a penalty of £30 an acre upon fields miscropped, without the tenant having previously obtained leave in writing. It was quite possible that when tenants came to the end of their leases, if there existed a bad feeling towards their landlords, they might be induced to incur a penalty by miscropping; for they would pay themselves better by so doing for one year than by pursuing the proper course. In such a case a penalty of £5 was far below the mark. The penalty did not apply to men who meant to keep their bargain, but to men who were dishonest and desirous of breaking their covenants.

Mr. DODDS agreed with the remarks of the chairman concerning penalties. To honest tenants it was quite immaterial whether it was £5 or £500. In ploughing up old grass fields, the harm which

was done extended not only throughout the whole lease, but to a very lengthened period; and if penalties were imposed for such acts, they ought to be so heavy as to discourage the tenant from incurring them. But with regard to the case of the turnip-seed mentioned by the chairman, he thought that he (Mr. Gray) had been driven to a false conclusion by a wrong-headed man.

Mr. TROTTER thought cases might occur where it would not do the land much injury, but a cross crop might be beneficial, and the landlord refuse his assent. They had bad landlords as well as bad tenants. He thought £5 an acre sufficient.

The CHAIRMAN moved that the penalty be £10 at least, instead of £5. If they sent out a lease to the world, they ought to show that the interest of the landlord had been attended to as well as the tenant.

The motion having been seconded, it was put to the meeting, and carried by a large majority.

A conversation then ensued relative to the taxes which tenants ought to pay.

Mr. G. LEE suggested that an agreement should be entered into between the landlord and tenant, relative to the payment of the land-tax. The tenant was liable to be called upon to pay it, unless he had previously made an agreement with his landlord to that effect. He had been called upon to pay it; and having taken legal advice upon the matter, he learned that he, as a tenant, would be obliged to pay it. In Scotland it was a landlord tax entirely.

The CHAIRMAN thought the tenant should pay all taxes except such as land-tax, tithes, &c.

On the clause relative to keeping farming buildings in repair being read, a long conversation ensued, in the course of which,

The CHAIRMAN said that it had been remarked that the landlord was bound to keep everything in proper repair; but if a tenant lived 10 or 20 miles distant from his landlord, was he to send a man to request him to get trifling repairs executed, and wait until his return, when, by undertaking to get the work done himself, he would save a great deal of time. He thought it would be much more convenient that repairs should be done by the tenant, than that men should get into a system of jobbing, which they would have great difficulty in overcoming.

The clause relating to insurance having been read,

Mr. DODDS said he thought the tenant should insure to the extent to which he was bound to keep up the premises. The landlord might, if he pleased, become his own insurer, and risk the main timbers, floors, &c, but the tenant had no interest in whether he did so or not. At the same time, it was better for the landlord that the premises should be insured

for the whole amount, the landlord paying the half of the cost. If the tenant did not insure, in case of accident by fire the landlord might refuse to put up his part until the tenant had put up his; and there had been cases of this kind, in which the tenant was left, during the greater part of his lease, in any kind of higger-mugger building that he could patch up.

The CHAIRMAN said he agreed in the propriety of tenants being insured. Poor tenants should insure to the full extent of their liability.

After some conversation,

Mr. DODDS moved that a clause concerning insurance should be inserted in the leases, and the motion having been put to the meeting, it was carried.

The clause relative to keeping fences, drains, &c., in proper repair having been read,

The CHAIRMAN said he thought it would be advisable to put a penalty upon tenants who kept drains stopped up. After land had been drained, a great expense was incurred by utter carelessness, in leaving the ends of drains filled up, and stopping the entire drain for ever so far back, when any one with a spade could clear such obstruction in ten minutes. It was a tenant's interest to do so; but, unfortunately, they did not always do what was for their own interest.

Mr. DODDS thought that when such obstructions were allowed to remain, after notice being given to the tenant, they should be cleared by the landlord at the tenant's expense.

On the clause relating to in-coming tenants taking the manure from the out-going tenants being read.

The CHAIRMAN inquired how that was to be regulated. They proposed to give a benefit to the tenant when he went away, and he received none when he entered. He did not think it was a bad clause, but that it would have a good effect in making the out-going tenant more careful of his manure.

Mr. DODDS said he thought the in-coming tenant might pay dearer for manure brought from a distant place, than for that of the out-going tenant at half the value.

After some deliberation, it was decided that the in-coming tenant should purchase the manure of the out-going tenant at one-half its value.

The CHAIRMAN said it was a very salutary clause, for the out-going tenant would have the opportunity of consuming his turnips, and this manure would be made for the benefit of the in-coming tenant. He had put a clause into recent leases, causing the out-going tenant to keep a full number of cattle to be fed in the courtyard as in former years, in order that as much dung as posi-

ble should be collected. With regard to regulating the matter, the only difficulty he had was that the tenant, when he went away, got a pretty large amount of manure, and when he entered he got none.

The SECRETARY proposed that one-third of the value of the manure applied to the last turnip-crop be paid to the out-going tenant. After some discussion, the motion was agreed to.

A conversation then took place between the chairman and secretary relative to the merits of guano.

The SECRETARY said he had known an instance

where great damage had been done by the application of guano to a crop of turnips.

The CHAIRMAN said he knew of an experiment having been made during the present year. One portion of a field of oats was sown in the ordinary way, and another portion was manured with guano. The latter portion of the field had a decided superiority over the other, and was cut ten days before the other part. It was also one-third more productive.

The discussion here terminated, and there being no other business to transact, the meeting separated.

## FARMERS AND THE LEASE QUESTION.

STR,—As you take great interest in discussing and exposing individual grievances, I should be glad if you could allow a little space to an individual, and a great national question, viz., renewable leases on equitable terms between the great landed proprietors and their numerous and striving tenantry. After many years of careful observation, I am fully persuaded that, under good, sound, equitable renewable (say every twenty years) leases, the farmers of England, Ireland, and Scotland would in a short time increase their productions in an almost immeasurable degree, compared with what can possibly be expected under those miserable and precarious annual and ill-contrived leases, subject only to the whim, caprice, or fancy of an ignorant sub-agent, who can in a few months' time deprive a striving, honest, and good farmer of his only possible chance of supporting his family, to make way for another who may be a friend or a partizan of this understrapper. Long experience will amply testify to the soundness of equitable leases; for it is a remarkable fact that in this county (Yorkshire) wherever good renewable twenty years' leases have been tried the improved value of the land and the large increase of production are perfectly astonishing, and far beyond any reasonable calculations. I can instance many cases of double the productiveness and greatly increased value of the land, in less than twenty years' time, under the late Lord Scarborough's lettings. This is a great national question, and it is also a landlord's and a farmer's question. As a national question it bears very largely on our great home productions and our increase in supply, now so much required for our vast and increasing population in Great Britain and Ireland. Good leases would be a mighty stimulus to all branches of agriculture, trade, and commerce; and if our raw materials could only be kept at reasonable rates, nothing would stimulate production to the extent that equitable leases on all kinds of holdings would be capable of doing; and hence a great national benefit. Second, as a landlord's question: if equitable leases are granted, the landlord must be a great gainer. He will share largely in the greatly improved value; and he has a right to a share, though not all the improved value. Suppose the matter is divided every twenty years, then both sides benefit as they ought to do, according to their right. Who would not give more for land annually, with a twenty years' renewable lease at half or quarter improved value, than take land at a mere haphazard six months' notice arrangement? The whole thing is as clear as that two and two are four. Landlords would realize more, farmers would make the land much more productive, and benefit would result

to all British subjects. Third, as a farmer's question: there can be no mistake about it; and never will the farmer succeed as he has a right to expect, until he has justice done him in his holding. I know there are thousands of farmers very contented under no leases at all, having the best, and perhaps the richest of landlords, and good honest agents. This must be acknowledged on all hands. But the majority, and the great cultivators and improvers of our native land, require and must have more security and more certainty in their terms, before they can have that confidence which is so essential to their own individual interests, as well as to those of this great and prosperous country. It must be remembered all are not rich nor good landlords, nor honest principal agents. Therefore, in strongly urging all farmers and landlords to make their interests mutual by good, safe, and equitable renewable leases, at moderately improved value, I am only uttering the strong feelings of thousands who would, if they dared, express themselves as one man, for equity for themselves and their families, as well as for their country. Every Englishman is interested in this great question of tenancy; and, speaking from large connexion with farmers with good leases, with no leases, and with old, miserable, worn-out, unjustifiable annual agreements (that cannot bear the light of reason or political economy), I feel sure that every landlord and tenant in our native land has only to look calmly and disinterestedly, to see that both have a larger share in mutual and good understandings than either of them have in the old, worn-out covenants now existing, and by meeting each other in a liberal and just spirit, by sound and well-improved equitable leases, this great producing and increasing population would feel the benefit of supply to an extent incalculable, and just in proportion to our increased knowledge and application of these artificial and valuable compositions, brought together by scientific discovery, of what is really required in the land to bring such vastly-increased productions to maturity, without exhausting the land for the following crop. Let, then, every farmer and landed proprietor, at the great agricultural meetings, discuss this important question, and, if a combination is really required, assist and strengthen one another. For what more righteous cause could a nation or a people combine? for it is for the true interest of this great country that equitable leases should be agreed upon, so that every holder of land may go on joyfully to "increase and multiply, and replenish the earth;" and it is high time those narrow, crude, and obsolete covenants should be swept away

by an enlightened, reasonable, and good understanding between both landed proprietors and their best friends—the farmers. Again I say, let all landlords look to their own interests, and show their readiness to grant liberal leases; so that Great Britain may keep the lead in agriculture and in commerce, and make this land one great productive garden, and the model farm of the world. It can, and must eventually, be done. We have the ways and means; and, therefore, let not the rusty old notions stop the enterprise. Only look at our improved implements. Ah, there was no restriction in the lease about these “great valuables!” Look again to the steam appliances—grinding, thrashing, reaping machines. Luckily, there was no impediment in the lease here. Look, again, at scientific discovery leading in the van of improved tillages, and replacing the exhausted ingredients which, with warmth and the natural elements and influences, brought that great prolific crop of wheat. Yes—sixty bushels an acre, and a second crop of sixty bushels an acre, in succession. Guano—that most useful and invaluable manure, brought thousands of miles—assisted in this second year's wheat crop. Look, again, at artificial guano, which will yet far supersede all the far-fetched. Only let science have its full play, exhaust Peru and you will create an artificial Peru here at home. It is so now, it will be more the case when farmers appreciate quality and concentration instead of bulk. Economy in tillages is and will be found in their handiness of use; concentration must take the place of clumsy and heavy inferior manures. It is a great fact that farmers cannot at present appreciate purely concentrated manure. Why? Firstly, because they cannot properly analyze them; and secondly, because they have occasionally been imposed upon, which is a grievous thing; for when a farmer pays a proper price for guano he ought, in justice, to have pure guano, or, if artificial, he ought to have the real concentrated element in the least possible bulk. It is not so yet. No; thousands of pounds per annum are paid for carriage of the mere vehicle of manure, the earthy or gravelly substance, which only accompanies the real essence, and which could easily be transmitted in 1-20th of the bulk and weight, and at an enormous saving. The chemists know it, but they dare not generally express the opinion openly. In answer to my many inquiries, “Cannot you concentrate your

manure very much more?” they say—“Yes, we can; but the manure is sold by ton, and we cannot make the farmer believe that we could give him every particle of value boxed or barrelled up in a cask for the small sum of £3 3s, what he now pays £6 6s. or £9 9s. per ton for.” No, no; the time has not arrived for such economy as this. A manufacturing chemist—of high standing, too—told me the other day that if they could not pay carriage and delivery perhaps 200 to 300 miles for their artificial manure at so much per ton, they could not compete with certain other parties without jeopardising their living and their connexion. I said, “Try concentrated manure, prove its worth, and be the first to establish economy in bulk and transit. What is the use,” I argued, “for a farmer to pay for carriage in nineteen cwt. at every ton more than he has a right to do?” “Oh!” says the manufacturing chemist, “we are like poor Stephenson, the railway-maker, before the House of Commons committee: we dare not say at what speed we could go, yet if we did it would be no go at all.” And so it was in the beginning with nearly every new fact, idea, or scientific discovery. The fact is, it is not fashionable yet to believe in discoveries at first. They must wait a little longer for the good time coming, when landlords, tenants, chemists, and all the people shall rejoice together, and know that they have a common interest in one another, and give up all petty attempts to take undue advantage of their separate special trusts and privileges; for after all, be it remembered, all our undertakings are but as a cobweb compared with the great Infinite, who knows everything and watches over all. His works are marvellous, and man's enterprises and inventions are prodigious and almost miraculous. Then let equity have its full and bright development; and what may not England, Ireland, and Bonnie Scotland achieve in the present century? Believe in right, ye owners of our native land, and ye shall be blessed with plenty by Providence for time, and trust to eternity for a good satisfaction. In conclusion, I may state that I am under a very poor and good landlord, and experienced agent, who have both outgrown, outlived, and given up their old and ill-contrived annual agreements.

I am, yours, &c.,

A TENANT AND AMATEUR FARMER.

Huddersfield Dec. 18, 1856.

## ON DRAINING CLAY SOILS.

SIR,—In a late number of the *Mark Lane Express*, Cecil, a well-known writer on the turf and sporting subjects, very confidently recommends to us farmers a plan for draining our clay soils. As his theory is directly opposed to the best authorities on draining—and he says, “I have not yet seen the plan tried, nor even heard of its being adopted”—his advice might be regarded as the haphazard conjecture of one not much acquainted with the subject, and as such not deserving of much notice. Appearing, however, in your pages, it acquires an importance to which its own merits do not entitle it; and although I have no serious apprehension that his “hope that it will be fairly tried in numerous instances” will be realized, I am fully assured that it must be productive of the most disastrous disappointment to any one who may be rash enough to adopt it; and as it may discourage some who are hesitating, I trust you will give me a little space to expose its futility. The substance of Cecil's recommendation is, not to drain clay lands deep, not so deep as four feet, and, whatever the depth, to fill the drains, to

within ten or twelve inches of the surface, with some perfectly porous material, such as burnt clay or ashes. In short, the whole of his argument proceeds from the long-exploded idea, that the object of draining is, as he describes it, “to draw off the water which descends in the form of rain with as much rapidity as possible,” whereas it really is, by furnishing overflow pipes to the water rising from below, to lower the water level, and thus to enable the rain water, charged with its own natural fertility and the manure through which it percolates, to descend into the earth as deeply as the roots of plants will penetrate. Singular enough, Cecil may find this, the true theory, most perspicuously explained in the article immediately preceding his own, in your last number, viz., Mr. Nesbit's lecture at Launceston. It was very clearly set forth, illustrated with plans and diagrams, in one of the agricultural essays of the late Mr. Gisborne, of Yoxall, published some years ago, having previously appeared in the “Quarterly Review.” Mr. Nesbit says, “The water never flows into the drains from the sur-

face: it sinks through the land, and rises to the bottom of the drain;" and proceeds to show, by a familiar illustration, the impossibility of getting a steady flow of water from a drain, except by the overflow. Doubtless shallow drains in clay, filled, according to Cecil's suggestion, with ashes to within a few inches of the surface, will, for a short time after heavy rain, carry off a considerable amount of water; but in grass land, open gutters would perform this very mischievous process more effectually; and for plough land, fancy ploughing-in twenty tons of dung per acre, to lie immediately on these porous drains through the winter! Mr. Meehi says that when he pumps liquid manure on his land, the four-foot drains run almost black; and the experiments of Professor Way, as reported in one of your late numbers, show that drain water, under any circumstances, carries off a vast amount of nitrogen in excess of rain water. We may easily, therefore, imagine what would be the effect all through the wet season if these porous, shallow drains lay in immediate contact with the manure. I trust I have now said sufficient to upset the whole theory of Cecil's rash and mischievous advice. I cannot, however, pass over his declaration, that he has "seen so many examples of total failure, where drains have been laid at this (4 feet) depth in strong clays," without a few observations. To a general assertion like this, unaccompanied with the circumstances, not even stating in what way the drains failed, I can only oppose my own pretty extensive experience in draining clay lands, which has brought me to a directly opposite conviction. Indeed, if I have rightly explained the principle, that drains act by tapping and drawing off the ascending body of water, not by catching it as it trickles from the surface, there can be no reason why deep drains should not have the same advantage over shallow, in stiff soils as in light. I have myself lately drained upwards of one hundred acres of clay land, having had some previous practical experience, and watched the operation of it pretty closely for the last twenty years or more. I began by draining to the depth of three feet, but latterly have always gone four feet, which I find much more effectual. I have invariably found, in clay land drained to this depth, that cold, wet pastures, covered with coarse sour grass, which nothing would eat, have, the first year after draining, been eaten off by sheep as closely as they could bite. I have seen this effect produced upon land by four-foot drains, which had been previously drained 18 inches with little or no apparent benefit. Sheep have been healthy upon land on which undrained I should have been afraid to place them; and it has been brought into a state for deep ploughing and improved cultivation which could not have been previously attempted. I regard all these as encouraging symptoms of success; but Cecil's sole test of good draining is the dryness of the surface; and if land is not to be considered thoroughly drained unless it will bear the treading of cattle through our long wet winters with impunity, I freely admit that draining alone, either deep or shallow, will not effect this. The improvement in this respect will be immense, much greater from four-foot drains than three; but we may as well expect to make a good road by draining only, as that even well drained land will bear the constant puddling and heavy tread of feet through a long course of wet weather. Again, if the land lies in hollows, pools are formed after heavy rains or snow, which puddle themselves by their deposit, especially if they are much disturbed, and will sometimes remain directly over drains for a considerable time. In this case, it stands to reason that water has a better chance of getting down to a shallow than a deep drain. But I have had some rather remarkable ex-

perience on this point, and am led to think that the escape of the water is prevented more by the consistence of the pan or basin of puddled clay immediately below it, than the depth it has to travel to the drain. Some years ago I drained a meadow, the lower part of which, by the side of a stream, had a subsoil of blue, sticky clay. There being no fall, I could not lay the drains here more than two feet deep. It was flooded, and some time after the water had subsided there remained, to my surprise, a large pool in a hollow which I knew was immediately over a drain. I concluded it was stopped, and got a man to dig a hole down to it, which he did till his spade scraped along the tiles—horse-shoe tiles on a flat sole. I then said "The drain is evidently stopped, but you shall leave it a little while till there is less water, and then open it." The pool, however, continued with little perceptible diminution for some days—two or three at least. I then told him to take up a tile and follow the drain down till the water ran off. To our surprise, on taking up the tile, the water ran off at once; the drain was perfectly clear, but the adhesive clay on the joints kept it out of the drain, or admitted no more than was supplied to the pool by the surrounding land. This circumstance, I must confess, rather staggered me at the time. Here, I said, is a considerable weight of water trying in vain to force itself perpendicularly down to this drain; how then can we expect that the sluggish under-current oozing through the subsoil should of necessity find its way into it? But if we reflect for a moment, we cannot but see that the same power which raises the great mass of water in its subterranean reservoirs is as powerful and irresistible, or rather infinitely more so, than that which takes it from the surface down below. Again it rises limpid, subtle, and penetrating, having got rid of the impurities with which it was charged in its descent. I have often dug a hole in an undrained land, and found no water, or even visible moisture; but returning to it the next day, have found the hole, though there had been no rain, half full of perfectly clear water. We may yet have much to learn as to the rationale of all this; but I have advanced nothing as a principle which has not been established as such by the test of experience, and I think few practical men will now be found to dispute the fact of deep draining being the most effectual means of getting water out of any kind of soil that has yet been tried. Cecil admits that, as far as his recommendation goes, he is not practical; he admits, too, that the deep drains which he accuses of failing continued "to emit water," so that I suspect they continued to do their duty faithfully, and that had all parties concerned done theirs, there would have been little cause for complaint. There are at the present time two grass fields on my farm, separated only by a hedge, both of which were drained four feet deep, rather more than a year ago. One, I am sorry to say, either accidentally or from mismanagement, has been sadly maltreated the last two months, which in my neighbourhood have been very wet. This field is a great thoroughfare: a field of swedes has been carted across it, some thrown down for cattle: a road across it in another direction has been stopped, to lay a hollow drain; hence it has been much trodden and ent by heavy carts in various directions. The consequence is that the appearance of this field just now is anything but satisfactory. 'Tis very true the cattle do not sink in up to their houghs as they would have done had it not been drained; but the surface is a good deal poached and trampled in places, and water has lain in the cart-ruts for days, and even weeks, immediately across the drains. A stranger, looking at this field, would very probably think that the

draining had completely failed; but looking over the hedge, would say that in the next it had been completely successful. Nothing has been turned into this since the wet weather set in. Now, I am not less sanguine about one than the other, believing that had they been treated equally well the result would have been the same in each. I know that in each the herbage has already been wonderfully improved; and in the autumn, when the undrained fields around them were the colour of rusty iron, these were of a healthy green. Deep draining was never intended to supersede good farming. I believe it to be a necessary preliminary to it; but if we will not follow up the advantages which it puts within our reach, and cultivate our land upon the most approved

principles, we have only to blame ourselves if we are disappointed. Impressed with these notions, I must have more full particulars, more tangible evidence, before I am convinced of the *utter failure* of four-foot drains even in clay lands. Of this I am satisfied by experience, that if they fail, shallower will not succeed. In the meantime I am content to be regarded as one of those wrong-headed beings, of whose existence Cecil professes himself incredulous, who, being permitted to think and act for themselves, have the hardihood, after the warning he has given them, "to persevere with the system."

I am, Sir, your obedient servant,

BATHOS.

## SELECTING CORN AND POTATOES FOR SEED.

"Like produces like," is an axiom often quoted in favour of the selection of the best seed for planting. Where a new variety—a new individual is to be produced, nothing can be more true. Every time, for instance, that seed is planted (and by "seed" we mean the ripened grains produced from flowers, as with corn, wheat, and turnips), a new and distinct individual is afforded from every seed planted; and if these seeds are liable to vary in their products (as with the apple), a new variety is produced by each. Some vary much less than others. The different sorts of wheat, for instance, produce the same when sown, for many successive generations, with scarcely a shade of variation. A very slow change, however, does actually take place, and a few rare plants may be found, among the millions in a large field, which have varied considerably from the seed sown. By selecting these rare seeds only, planting them, and then observing the same course with their product, new and distinct varieties are obtained.

The same result takes place by the careful selection of the seed of corn. By continually selecting the ears soonest ripe, early sorts are procured; by choosing the largest ears only, large varieties are obtained; and by taking those exclusively where several ears are found on a stalk, prolific sorts become permanently established. It is much easier to select seed corn, in this way, than seed wheat; and the practice should be adopted by every farmer.

Reasoning from analogy, many suppose it to be equally important to select large potatoes for "seed." But a great point of distinction is here overlooked. In planting a crop of potatoes, new individuals are not yielded. The tubers, which are only an enlargement of that portion of the stem beneath the soil, furnish eyes or buds, and the same variety or individual is increased and extended, but no new one is produced. A pink-eye potato was in the first place obtained from seed taken from the ripened balls. It thus became a distinct variety or individual. But the operation of cutting and planting the tubers is only an extension or multiplication of the same individual—the result is still pink-eye potatoes, without the slightest shade of variation—no more than if the original plant was allowed to grow without disturbance, until it had become a large stool of many plants.

An Isabella grape may be multiplied by layers; but every plant thus produced is only a portion of the parent. It can never, by this process, become a new sort. The same result takes place in budding or grafting. A Baldwin apple tree may bear ten thousand buds. These ten thousand buds may be taken from it, and each inserted into a separate stock or seedling, and thus ten thousand Baldwin trees be obtained. But every one will be only a portion of the same original tree, and no variation whatever will take place in any point of character from the parent. But if seeds from the apples be sown, new individuals, new varieties are at once obtained.

For the reasons already given, it is far less important to select large potatoes for planting, than to make selections of the best ears of corn. In one point of view, it is of no consequence whatever, whether large or small potatoes are planted. We know several skillful cultivators, who have supplied the market for many years with the largest and finest potatoes, who say there is no difference whatever. We think, however, there may be a difference; and it sometimes becomes of some importance. Small potatoes, for instance, under ordinary management, will yield stalks more abundantly from their more numerous eyes; and the product will consequently be more in number, and smaller in size. Again, when the ground is very dry, large tubers will furnish a longer supply of moisture to the young plant, giving it a more vigorous start. A variety likewise may, by long-continued bad cultivation, become constitutionally enfeebled, just in the same way that a tree may become stunted, and require some years and favourable influence to restore it. We think, however, that the result is very small or very rare, so far as the potato is concerned.

On the whole, therefore, while we would urge, as of great importance, the practice of choosing the largest or earliest ears of corn for seed (and in fact the best of any grain or seed produced from flowers) we are compelled both by theory, and from the practice of many experienced and skillful cultivators, to regard this practice as relates to potatoes as of far less importance; and by avoiding too thick a growth of stalks, or a dry soil, of very little consequence whatever.—  
*Country Gentleman.*

## THE PRESENT PRICE OF GUANO.

Another rise in prices! And that worthy man, the British farmer, is pictured tumbling head over heels, standing glasses round to whoever will drink them, buying new bonnets for his wife, a hunter for himself, and committing all sorts of such warrantable extravagances. Another rise in prices! The yield is found to be getting worse, or foreign supplies are not coming in, or war is breaking out, or something or other has happened to give him another turn. A rise in prices may not, perhaps, be all one way. A rise in rent and labour may sooner or later be "the accompaniments." Still, if there be another rise, the world is always ready to make the most of it; and John Browdie is complimented and envied and abused accordingly. It is astonishing how willing people are to believe their neighbours are making fortunes.

Another rise in prices! Not in wheat, most attentive of readers; nor in barley, not even in beans, that we care to speak of. Another rise, most interested of publics, not in corn, but in that which produces, or multiplies the production of corn. A rise, in fact, against the farmer instead of for him; and not only against him, but against you and us, one and all, whatever our lot may be. Despite all heaven-born orators have said, the more this country can find for herself the better will it be for her. Everybody knows this now. The Government and the people—the consumer and the producer—alike admit the force of the argument.

In thus increasing our own resources, we have of late years learnt to rely very much upon one especial agency in accomplishing this. The advance of modern agriculture is closely associated with the use of extraneous, or what are called "artificial" manures. We employ every available means to obtain them. We tax our invention, harass science, test practice, and start more adventurers in life than ever so innocent an occupation could have previously even dreamt of. The encouragement, moreover, which we offer is the most sound and substantial. We give a good price and a handsome profit to those who will serve us fairly. There is scarcely any new branch of business on record where money has been made more certainly than in the manufacture or sale of this extraneous manure.

We do not, however, give enough. With one wave of his baton, the mighty Jullien stills his audience, and commands the anxious attention of his hundreds of fiddlers. With one dash of the pen do the Messrs. Gibbs achieve as grand an effect. Without even the gradual warning of an overture, we come at once to the crash. It is striking enough. To adopt a somewhat common phrase, "it quite takes the breath out of us." Audience or musicians, customers or agents, are alike aglashed. Everybody uses, and everybody in the trade deals in, guano. And hey, Presto! up goes guano two pounds a-ton in a moment!

It is a very well-recognized principle, in a commercial country like ours, that a man should be allowed to make the best of his business; or, that if he have the game in his own hand, he should be permitted to play it out. More than this, it is known that the Messrs. Gibbs do deliver the genuine article they profess to, and that the excellence of their wares is unquestionable. It is equally palpable, however, that they rule with the iron hand of a monopoly. If twelve pounds a ton was a fair remunerative price for Peruvian guano last season, why should it not be this? Or, if some other deposit were discovered, would it not be? It is, in fact, to this we are coming. This rise to fourteen pounds, as far as we can understand it, means to say that the Peruvian supply is becoming gradually exhausted, and that for what there is left we must pay more money. Again we recognize a commercial principle; just as we should have to pay more for bread when we were short of it—for wine, wool, coal, or whatever it might happen to be.

Peruvian guano, then, will not last for ever. To many of us even before long it promises to be an unattainable luxury. How then are we to go on? Can we do without guano, or can we find any more of it? Let us consider this last point first. From time to time we are continually hearing, by letters and paragraphs in the papers, that new deposits of guano *have been* discovered. We are assured of something more than there being only a mere hope of such a store. And this is all we do hear, or are assured of. There have been some difficulties to encounter, and these have not been encountered. In a word, we believe the subject has not received half that attention its importance deserves. We publish in another column a letter from a firm at Lincoln, pointing to certain other islands having an extensive deposit of good guano, which appears but too likely to be lost to us. We repeat, it is a matter much neglected so far by our own Government—the only quarter, after all, to which we can look for redress and assistance. Considering the important item guano has now become in the cultivation of the soil, there should not be a rumour or likelihood of its existence but that should be thoroughly and determinedly inquired into. Does it stand to reason or sound probable that because there is guano on some of the islands of Peru, there should be none elsewhere? On the contrary, we believe that time, with a little more energy and activity on the part of our rulers, will prove there is more to be had; and that, as a consequence, this rate of a fourteen pounds is not exactly a necessity.

There are good farmers yet, who will tell us that a farm may still be made self-dependent for its own supply of manure. If a man will only use his "other corn" liberally on his land, he may grow as great crops, and have the soil to continue in a far better con-



dition than he ever can hope to by the use of artificial stimulants. We need not stay, however, to argue this now. The Messrs. Gibbs will tell us, no doubt, that the farmers must and will have their manure. The only question with us is, whether they must and will have it *at any price?* According to precedent, £14 to £15 a ton looks by no means the ultimatum. Reversing the tactics of the peipatetic auctioneer we appear to be only and surely reaching a higher and a higher rate. The further we proceed on the ascendant, the more cause shall we have to consider two points that it would be just as well to try and answer at once—Can the farmer do without guano? or can he, or the Government, or any one else, get it elsewhere? We have been pausing too long for a reply.

At the first meeting of their new year's session, on

the first Monday that is in February, the members of the Central Farmers' Club are again to discuss this question of manures, both farm-yard and artificial. Mr. Baker, of Writtle, has undertaken to introduce it, and no doubt he will avail himself of "the opportunity which now occurs." The Royal Agricultural Society, again, though nothing may have come of their thousand pounds reward, may still aid us here. With the return to health of Mr. Way, we trust again this spring to hear one or two more of his able lectures on the subject, and to see them at once distributed throughout the land on which they may do so much good. The more and more the farmer knows about manures—scientifically or practically, artificial or home-made—the better will he be able to deal with guano at four teen pounds a ton.

### GUANO.—EXHAUSTION OF THE PERUVIAN DEPOSITS—NEW SUPPLY FROM THE KOORIA MOORIA ISLANDS.

SIR,—The recent advances—amounting to £2 per ton—upon the already high price of Peruvian guano, are, we fear, but the forerunners of a further rise. At this moment the agriculturist of this district, requiring less than 30 tons in one lot direct from the importers, cannot obtain his supply at much less than £15 per ton, carriage, &c., included. The reason assigned for these advances is that the supply is very considerably less than the demand. The monopolists will therefore naturally exact the extreme price, especially as it is now clearly ascertained that the whole quantity of guano remaining in Peru must soon be exhausted at the present rate of consumption.

The agriculturists are therefore anxious to ascertain what prospects there may be of obtaining a future supply of this valuable tillage; and, from the very numerous inquiries at this institution upon the subject, we have reasons to assert how great was their satisfaction on learning, through the medium of your columns, that her Majesty's Government had obtained the cession, and taken lawful possession of, certain islands known as the *Kooria Moorina* group, upon which very extensive deposits of guano had been found. We have by accident had the opportunity of knowing the quality of the guano from this new source, and, as practical chemists, we say, without fear of contradiction, that upon the whole it will amply compensate for an entire cessation of the Peruvian supply, assuming the quantity to be large, and of which we are assured upon undoubted authority; and more especially could the supply of Peruvian guano be dispensed with, since the latter has reached a price exceeding its agricultural value.

General hopes were entertained that ample specimen cargoes would have reached England this season, and numerous have been the inquiries at our several places of business, since the announcement, of the almost improbable cause of delay. The public are now given to understand that the parties duly authorised by our Government to bring this guano from Kooria Moorina were forcibly expelled from thence by an armed band of piratical Arabs, and that the discoverer, Captain Ord, and his people, were thus compelled to return to their ships without a cargo; and, if we are not misinformed, at the very same time ships under American colours were absolutely loading from these very deposits upon the islands in question.

If we remember that these islands, although unprotected by any military or naval force, are *de facto* an integral part of the British Empire, having formally been ceded to her Majesty by the Imaum of Muscat, their former sovereign, the conduct of both the Arabs and the Americans will appear in its true light, viz., as an outrage on our national flag, and a grievous injustice to the discoverer and his copartners as British subjects.

We gather from a notice issued by the authorities to the collectors of customs at the various ports of the United Kingdom, that the last-mentioned gentlemen have obtained a lease or grant empowering them to remove the guano from these islands under certain restrictions made by her Majesty's Government, extremely favourable to the agriculturists of the United Kingdom. We have also ascertained that in compliance with these terms vessels have been fitted out, and that great expense has been incurred in completing the arrangements to bring home this valuable commodity. If so, surely our Government will never permit such an insult to our flag to go unpunished.

A small ship of war detached from the Indian navy, or the grant of a letter of marque to the lessees of the island (who have undertaken to bring home the guano) to arm a vessel for the protection of this valuable property, would effectually prevent the recurrence of these piratical "fillibusterings."

Although the casual failure in this important and desirable undertaking is to be regretted, the ultimate success of the whole matter is one involving very considerable interests, and consequently worthy the prompt attention of the authorities. As the matter stands, it involves both public and private loss and injury. It is, however, not too late to do all that is requisite for the future.

Looking at this matter as important to an influential body of shipowners, who can from these islands always insure a valuable return cargo from Bombay, &c., and considering the vast importance this guano will be to the landowner, the tenant farmer, and the country at large, it is to be hoped that prompt and efficient measures will be taken in the premises with the prosecution of such measures as may be needed.

Without wishing to recommend any particular course to be

pursued, it would not be unadvisable to give intimation of the foregoing outrage to our various consuls in America, instructing them to look out for vessels arriving with guano; and if the parties engaged in removing the guano from the islands should by such means be obtained, we are assured they would be subject to punishment by civil process in America, as in

England, if they were not more severely handled by the criminal laws of all civilized nations.

We are, Sir, yours very respectfully,

FOX & SLATER, Analytical Chemists.

Northern Analytical College, Agricultural Branch,  
Corn Exchange, Lincoln, Jan. 6th, 1857.

## THE METROPOLITAN SEWAGE QUESTION.

I had begun to feel some risings of envy in my breast on comparing the happy and enviable position of the farmers along the valley of the Thames, its marshes, and the other similar districts, for whose more especial profit the London sewage was about to be made available. I was about to estimate the immense advantages that must necessarily accrue to all lands which were to be supplied with the copious fertilizing showers communicated through the hydrants of the Metropolitan Board of Works or other sewage commissioners. My speculations ran upon the astonishing root and esculent crops to be produced (large they must always be, and know no ending, for this rich flow of liquid manure, so plentiful and continuous, would not only keep up, but enhance the fertility of the soil enormously). I sanguinely looked forward to the heaviest and most productive crops ever seen of potatoes, parsnips, carrots, cabbages of every variety, turnips, mangel-wurzel, celery, and all kinds of minor esculents and herbs. Again my mind reverted to those many plants of great marketable value, but requiring either more expensive cultivation or greater fertility in the soil. This sewage provides abundant food for each and every one of these, *i. e.*, brown mustard, every variety of turnip, mangel-wurzel, cabbage, carrot, or any other vegetable or esculent may be cultivated here for their seeds, and with the most assured prospect of success. In pursuing my theme, I thought again of what immense value these lands might be made to the chemist, the dyer, or the confectioner; what surprising crops of chicory, woad, madder, liquorice, caraway, coriander, or even roses, lavender, and the like, might be cultivated! or, again, what abundant and beautiful crops of hemp and flax might be raised for manufacturing purposes! My mind could not dwell at all upon ordinary corn crops: the soil would be by far too highly fertilized to bring corn crops to perfection: no; henceforward all lands, to undergo the periodical besprinkling of this highly-charged sewage, will be too rich for cereal crops, and must be devoted to the more valuable root or esculent crops, so greatly in demand near the metropolis. Still pursuing the subject, I was led to view as arising in these districts many manufactories for the manufacture of beet-root sugar, peppermint, and other distilleries, oil mills, flax reteries, &c., &c., &c.; in fact, I could not set bounds to the productive powers of soils rendered inexhaustibly fertile by the *ad libitum* application of town sewage. On the contrary, I looked upon such soils as being constantly in a progressive state, and never likely to require other replenishing; and such I

believe will be the actual accomplishment by the application of town sewage.

I had for several weeks been indulging myself with speculations of this kind, and promising myself, at no distant period, a visit to these favoured districts, for the purpose of witnessing the wonders wrought by such a wondrous application, and feasting my farming appetite upon all the good and great things opening before me; proposing also to introduce into my own practice, as far as possible, whatever I might be able to make available. Judge, then, of my disappointment upon finding all my fine hopes and long-cherished ideas crushed in the bud by the Metropolitan Board of Works, who have determined to present to the Chief Commissioner of Her Majesty's Works a scheme for discharging the London sewage into the Thames; and I find, further, that the determination appears to meet with favour, or be sanctioned by the result of the discussion which has so recently taken place by the Society of Arts upon "the utilisation of town sewage," the great tendency of the discussion being to show that deodorization of this sewage was of little value as a manure, and the liquid distribution dangerous to the health of the inhabitants residing near to the places of distribution. I am extremely unwilling to give up to the German Ocean such immense stores of fertilizing matter; surely some talented chemist will be found to discover a method of fixing the ammonia in some substance of convertible use. To permit three millions of annual value to escape into the Thames without some greater effort to retain its valuable components is deplorable. I have witnessed the mode of deodorization by milk or cream of lime. The effect is perfect as a deodorizer; but I care nothing for deodorization, provided I could have the sewage in a portable convertible state. Who ever objects to Peruvian guano because it is not inodorous? The grand desideratum is to fix the ammonia contained in town sewage in a substance or liquid of ready portable shape. The man who does this will rank with his country's greatest benefactors; this would entitle the discoverer, I presume, to our Royal Agricultural Society's prize of £1,000, as a substitute for guano. I am sanguine enough to predict that it will, ere long, be done.

The subject is of such paramount importance, that I beg to refer to the discussion by the Society of Arts of Dec. 10th last. Mr. Fothergill Cooke read the introductory paper, detailing the course pursued in collecting and deodorizing the sewage of Leicester, from which

I gather the following facts : that the population of 65,000 yielded 6,000 tons of solid matter between May 1855 and December 1856 from 8,000,000 tons of sewage; that London sewage annually contains about 10,000 tons of ammonia, equal to the requirements of 320,000 acres of land, and the market value of this quantity of ammonia is £600,000; that this sewage can be deodorized and converted into matter at 3s. to 4s. per ton; that this solid sewage "contains the debris of every description of animal and vegetable matter mixed with some valuable mineral substances"; that the deodorization is effected by the aid of cream of lime, "which deprives it of all odour, and precipitates almost all the salts and solid matter to the bottom"; and that when so deprived of ammoniacal odours, it is, notwithstanding, a cheap and useful manure of the value of £2 to £2 15s. per ton. Dr. Lyon Playfair thought it was not a wise policy to send away all the metropolitan sewage to feed sea-gulls and sea-lions; that the effete matter of a population was just the manure to be applied for providing food for that population. Mr. J. B. Lawes said this sewage deposit was no longer a valuable artificial manure, but it was to be ranked with lime, chalk, clay, &c., &c.; that lime would not precipitate

ammonia or its salts from the liquid containing it; that it was impossible to assign any money value to the Leicester solid sewage; that if no district could be selected for the fluid deposit, he would "away with it to the German Ocean." Mr. Chadwick spoke of danger in a sanitary point of view. Mr. Mechi advocated the application of sewage in a liquid state. Other gentlemen spoke upon the subject; and from the general tenor of their remarks, I gather that the conversion of town liquid sewage into solid sewage is of very little real manure value applied to the soil, owing to its being deprived by the lime of its ammonia. This, then, we repeat, is the grand desideratum—a process to fix the ammonia in solid sewage. Are there no earths, no soils, which could be applied to arrest and retain the ammonia? Could clay, peat, coal ashes, soot, gypsum, or other substances said to be useful in fixing ammonia, be made available? The imports and exports of any substances for thorough impregnation to any works for deodorization of sewage is of comparatively little moment. QUERY—What quantity of any of the substances named above would be required to arrest and imbibe the 10,000 tons of ammonia created in the metropolis annually?

*December 22, 1856.*

#### A VISIT TO THE LOWESTOFT FISH MANURE FACTORY.

DEAR SIR,—Being on a visit in Suffolk this Christmas, and within a few miles of Lowestoft, I availed myself of the opportunity of riding thither, to take a look at the fish manure factory recently established by Messrs. Molon and Thurneyson, the spirited proprietors of similar works at Concarneau, on the west coast of France, and at Newfoundland; the latter of which is upon a grand scale.

I regretted to find, upon inquiry, that neither M. Thurneyson (the managing partner), nor the gentleman who superintended in his absence, was at home; the former being at Paris on business, and the latter out for the day. I however found the engineer on the spot, who politely afforded me every opportunity for inspecting the different departments of this very simple, but very effective manufactory, which I shall now proceed to describe.

The factory itself exhibits on the outside a plain, substantial, but inexpensive building, adapted in every respect to the purpose for which it was intended, but quite destitute of those attempts at ornament displayed in too many of our English public buildings, and which are as much out of taste or character in places of business as would be a gay and gilded hearse at a funeral. This will especially apply to our railway termini, on many of which money has been squandered with a profusion that leaves the gulled shareholders nothing but regret at having trusted it to neglectful or dishonest directors: whilst the accommodation to the travellers and supporters of the concern is of the most miserable description. A splendid columnar building to pay your money at, and a cattle-pen to travel in, is the general

rule with the railway oligarchy, who, having established a monopoly of the road, treat their customers more like bullocks or pigs than human beings on whose patronage they rest for support.

But let that pass. Messrs. Molon and Co. have acted wisely, and set a good example, by expending their money so as to secure perfect efficiency at the smallest expense. On entering the building, the first thing that struck my eye was a revolving boiler, of a cylindrical form, in which the fish are subjected to steam for a sufficient time to decompose them enough to render the separation of the water by pressure more easy. This process is accomplished, by hydraulic presses, in bags made of two flat, circular pieces of mat, apparently of Indian hemp. These mats are sewed together at the edges, the upper one having a hole in the centre to put in the boiled fish. Being filled, they are placed under the press, with a plate of zinc, the same size with the bags, between each. When the requisite number are placed on the table of the press, it is set to work; and in a short time, by repeated squeezes, the greater part of the moisture is expressed from the mass. In the meanwhile, the liquid which flows from the press runs, by pipes, into cisterns placed in the basement. These have steam-pipes laid on at the bottom, in order to preserve heat, which facilitates the separation of the oil from the water. Two qualities of oil only are at present made, the best of which is very pure, and sells readily. The inferior consists of the dregs, with a portion of the best oil, and, I apprehend, might be purified by a proper apparatus, so as to render the whole available, except the solid matter, which would

still be valuable to the soap-makers. When the oil has all risen in the tanks, it is drawn off, and put into casks.

The pressed fish, which are converted into a hard cake, are thrown out of the bags and broken up. They are then subjected to heat in the stove, in order to divest them of the remaining moisture. The stove is a long square structure, divided into compartments, and heated by steam pipes; they are fitted from the top to the bottom, with ledges placed at short intervals on each side, to receive the slides on which the pressed fish is spread; these slides are not more than two or three inches deep, with a canvas bottom and wide enough to fit exactly the compartment. The mode of charging the stove is simply placing the first on the slide, and then shoving it forward with the second, and that with the third, and so on till the compartment is filled; the rest being charged in the same manner. When the drying process is completed, which requires some hours to effect, the slides are shoved out at the opposite end from which they are put in, by others containing a fresh charge; and thus no time is lost in charging and discharging the stove, which contains about half a ton of the dried fish.

The next process is the reducing the dry matter to a powder, which is effected with a pair of Cologne or English stones (I am not certain which), from which it comes out perfectly pulverized, and is then put into bags holding about half a hundred weight, which is the last and finishing process, it being then ready for sale. The whole of the processes are effected with the aid of one steam boiler of from twenty-five to thirty-horse power.

Nothing can be more simple or more complete than the way in which this manufacture is carried on; but it is a question with me whether the desiccation could not be effected *without the boiling process*, by merely

passing the fish in the raw state through the hydraulic press, so as to extract the oil and water, and then drying it in the stove. By this means not only would the oil be better, from being *cold-drawn*, but the manure itself would be thereby improved by the retention of the grosser parts of oleaginous matter, which is now separated by the boiling process, in a liquid form, and run off with the fine oil. That the retention of any part of the fish, but especially the oil, would improve the manure there cannot be a doubt; and probably the refuse of the oil, which would alone be retained, would, by saving the boiling process, be sold as profitably in the form of manure as it now is in that of inferior oil. This is a consideration we throw out by way of suggestion only, having no other data to go upon than analogy. We know that *cold-drawn* whale and seal oil is more valuable than that extracted by boiling; and that rape-cake for manure is prized according to the proportion of oil it contains. It therefore follows that any kind of fish oil must be better cold-drawn than after boiling, and that fish manure would be improved by having the grosser oleaginous matters left in it.

I am glad to hear that the London and West of Ireland Fishing and Fish-manure Company have commenced working, and heartily wish them all the success they can desire. They had a stormy commencement; but I do not hear that their shipping has sustained any material damage. They have an experienced man in Captain Symonds at the head, who is too cautious to run unnecessary hazards, but at the same time will keep the concern at work.

I am, dear sir, yours truly,

AN OLD NORFOLK FARMER.

London, Jan. 1.

## SALE OF CORN BY WEIGHT.

### MEETING AT GLOUCESTER.

A public meeting of farmers, merchants, millers, and others interested in the corn trade, was held at the Bell Hotel, Gloucester, on Saturday, Dec. 27, "To consider and recommend such regulations as to the sale by weight at the new corn market as shall appear most conducive to general convenience." The subject apparently excited a good deal of interest. The chair was taken by J. C. Hayward, Esq.

The CHAIRMAN, in opening the meeting, stated its object, and pointed out the desirability of coming to a perfect understanding as to the mode in which corn should be sold for the future, in Gloucester market. Referring to the meeting of millers and others held a fortnight previously, the resolutions of which meeting had been published in the Gloucester papers, the Chairman said, that without saying whether he agreed with the resolution adopted at that meeting, he thought it very desirable that the millers and farmers should come to a mutual understanding on the matter. He agreed with those parties that weight was a desirable standard, but that meeting was not in the nature of a public meeting, and there were a great number of buyers and sellers who had not had an opportunity of attending it, and he thought that was not the proper way

to settle the question. It would not do for buyers to come to a resolution to sell by one standard and sellers to sell by another. Mr. Hayward pointed out the inconvenience of having different standards of the bushel in various markets of the kingdom, and expressed his opinion that weight was a better standard of value in grain than measure. But they found that Government had adopted a scale of measure: all grain was calculated by the imperial bushel, and the tithe averages were calculated upon it. When this plan was adopted by the Government the object was to get rid of the various local measures in use in the country. He thought they should go as near that as they could, and the best means of doing so was to get at the weight of a bushel of grain as near as they could: this of course would vary in different parts of the country. The farmers of this county considered 62 lbs. was considerably above the average weight of wheat per bushel: it exceeded the average weight in the vale, and greatly exceeded it in the hill district (Hear). He fancied that about 61 lbs. was the average weight of the bushel of wheat in the vale of Gloucester, and he had the opinion of an experienced miller, which confirmed his own

that point. Another miller had put the average weight of the hill wheat at 59 lbs. the bushel: therefore the medium would be 60 lbs. At Bristol market wheat was also sold by the 60 lbs., and he found that the Government stated 60 lbs. as the weight of the bushel in making the tithes averages, &c. He was told that it was a general practice to sell at 62 lb. the bushel. Now if it was the general practice throughout the country he would at once yield, but he did not find that it was anything like universal. At Birmingham wheat was sold by the 62 lbs., but he was told that at Worcester English wheat was sold by the bag of 3 bushels and 9 score and 10 lbs., which was 63½ lbs. per bushel (A voice: "No, it is 62 lbs.") He (Mr. Hayward) was told that it was 63½ lbs.: they sold by the bushel, and the farmer made up the weight to that. He thought that was a bad practice. The Chairman concluded with some further remarks on his experience of the sale of wheat by weight, and by expressing a hope that every speaker who addressed the meeting would be heard with patience, and would confine himself strictly to the object of the meeting.

Mr. D. LONG said it would be necessary, in order to understand their present position, that he should refer to the formation in Gloucester of a "Society of Millers," and to what steps had been taken by them. He must say that he did not agree with the manner in which they had conducted their recent meeting. At that meeting, to which a few farmers had been invited by circulars, it was resolved that 62 lbs. should be the standard on which they would buy and sell wheat. But he would say that that was not a public meeting—(Hear, hear)—or he would not quarrel with the decision which had been come to.

Mr. W. JONES: Query. The farmers did not agree to that resolution. I was there.

Mr. LONG continued: He believed 62 lbs. was beyond the average of the market, and if they adopted that weight they would exclude the Cotswold growers from the market. As a proof that the Government considered 60 lbs. to be the average of a bushel of wheat, he would read a letter which he had received from Mr. Willich, in reply to an inquiry which he (Mr. Long) had addressed to him. This letter, which was dated "London, 1st Jan., 1857," contained the following passage:—"In reply to your letter of the 27th, I beg to state that I understand that when wheat is sold at 70 lbs. to the bushel, or 62 lbs., it is reduced to bushels at 60 lbs. for the purpose of the averages." This was not only so, but he (Mr. Long) believed that 60 lbs. was adopted as the weight per bushel in nearly all the ports of this country except Liverpool. That, he thought, was a good reason for establishing it at Gloucester. He believed the Cotswold-hill district average would not exceed 59 lbs. After some further remarks Mr. Long moved:—"That if weight be substituted for measure in Gloucester, the meeting recommend the scale adopted by the merchants of this and many other ports, viz., wheat 60 lbs., beans 65½ lbs., barley 50 lbs., and oats 39 lbs., as approximating as nearly as possible the average of 8 gallons imperial of different kinds of grain throughout the country."

Mr. KIMBERLY suggested that it would be desirable first to settle the question whether they should sell by weight or measure, before deciding upon the actual weight, and proposed a resolution to that effect, which was agreed to without discussion.

Mr. Long's resolution was then altered by omitting the first nine words, and was seconded by Mr. Stallard.

Mr. REYNOLDS defended the course adopted at the meeting held a fortnight previously. The gentleman who said the farmers did not agree to the resolution passed at that meeting he believed was one of those who had actually signed the reso-

lution. It had been asked of the millers why they wanted weight to be the standard, and he would answer that if farmers would bring their sacks of wheat to market, and let them put their hands into the bulk, he for one would not ask any one's judgment as to the weight of the corn. But they could neither judge of the weight or the quality of a bulk of corn from a sample of less than an ounce, and which had been carried in the pocket of a man riding on horseback to market, and afterwards, perhaps, sitting before the fire, which must cause it to dry. Then as to the reason why they wanted the weight fixed at 62 lbs., he would answer that all their engagements in reference to freight, tonnage, sack hire, and portorage, were calculated at so much per bushel, and the difference between fixing it at 62 lbs. and 60 lbs. would affect them very materially. Then he maintained that it made no difference to the tithes or rents of the farmers whether they sold by the 60 lbs. or the 62 lbs. As to the custom in other places, in Lincolnshire generally, the weight was 63 lbs.; at Worcester, Stourbridge, Ross, Hereford, Birmingham, Tewkesbury, Monmouth, and the South Wales markets, all had 62 lbs. as the standard; and he was told that even at Tetbury-on-the-hill district, the average weight was 61 lbs. (No, no.) After some further remarks, Mr. Reynolds wound up by saying that in a meeting like that a show of hands would not represent the arguments of the question, and therefore he did not mean to take one, but he had stated his case, and submitted it to the consideration of the meeting, thanking them for the kind attention which they had given to his remarks.

Mr. FEWSTER and Mr. FRIDAY followed on the same side, expressing themselves favourable to fixing 62 lbs.

The CHAIRMAN said it appeared from Mr. Willich's letter that whatever weight wheat was sold at, it would not affect the tithes averages; but some rents were fixed according to the average of the Gloucester market, and not according to the imperial average, which would be of importance. It was also desirable to influence other markets: it would not be well for Gloucester to take an isolated position.

Mr. T. M. STURGE said the fixing of the general average at 62 lbs. would be convenient to his firm, because they sold at that weight in many markets. They sold at 62 lbs. in Gloucester, Birmingham, Worcester, Wolverhampton, and other places; 75 lbs. at Shrewsbury, 80 lbs. in Monmouthshire, 70 lbs. in Liverpool and Hull, and other markets 63 lbs. He wished it to be understood that he had no bias in favour of the millers on the one side, or of the agriculturists on the other; but he rejoiced to see that the meeting was in favour of weight over measure, on account of the continual disputes which arose between the agriculturists and the millers when corn was delivered by measure, and it proved some pounds per bushel less in weight than the miller supposed he would receive. He thought it would be highly desirable if a uniform weight could be established by the legislature throughout the country, for he considered such a step could hardly be deemed an undue interference with the liberty of the subject. What that uniform weight should be he would not suggest, but would leave it to the discussion of the legislature.

A letter from Mr. PHILLPOTTS was read, expressing an opinion that the fixing the weight at 60 lbs. would prevent millers attending the market.

Mr. J. LONG arranged the management of the meeting of millers. He could not as an individual farmer have set himself up as an authority for the whole of the county. He considered 60 lbs. would be the fair average of the growth of the county of Gloucester: the weight on the hills did not exceed 58 lbs. He proposed that if the millers would not buy their

wheat at 60lbs, they would be pleased to allow them to sell it to others.

Mr. S. SIMS maintained that the average of wheat brought to Cirencester market was 60lbs. The millers who attended the previous meeting intended to buy wheat at 62lbs, whatever others might do. They might sell it if they liked at 60lbs., and the millers would buy it of him at 62lbs., and no doubt he would get a good profit by it.

Mr. LLOYD BAKER said it appeared to him there was very little behoven them now that they had ascertained that the weight would not affect the tithe averages. There was, however, one point brought forward by the millers which he could not hold with—he meant their argument about their arrangements with other parties. He would ask them, did not they think that the railway companies, the sack-owners, and the warehousemen would find out whether the bushel was 62 or 60lbs.? But it was not worth making a great stir about on

either side, and he should almost propose to toss up a half-penny and settle the matter that way. But 60lbs. was the Government weight, and the weight adopted at most of the ports, though there were a great many important towns where 62lbs. was the weight. What he hoped was, that the whole country would come to adopt a uniform standard value; and if so, he thought it most desirable to adopt rather an even number like 60 than an odd one like 62lbs.

The CHAIRMAN impressed the desirability of having a mutual agreement between the farmers and millers, and asked if any amendment was proposed.

No amendment being moved, the Chairman put Mr. D. Long's resolution, which was carried by an overwhelming majority, only three or four hands being held up against it.

A vote of thanks was then passed to the Chairman, and the meeting broke up.

### THE HOME AND FOREIGN SUPPLY OF TALLOW.

While purchasers occasionally complain of the extreme fatness of the class of domestic animals now raised for the shambles, we nevertheless hear of no surplussage of tallow. The price of animal fat keeps up; and the demand is more extensive than ever. The housewife finds she has to pay a large price for the suet for her Christmas pudding; while the cook obtains a remunerative market for her kitchen-stuff.

What the home production of tallow is we cannot tell; but, in addition to the fat of the large stock of cattle and sheep slaughtered in the kingdom, we import, on the average, about 50,000 tons per annum.

Ingenuity is taxed in various ways to augment the supply of animal fat and oils required for commercial purposes. In Paris, where the recent imposition of a dog tax caused the slaughter of a large number of the canine race, the bodies have been boiled down for fat, which fetches nearly 1s. per pound, it being used in the preparation of kid-gloves, especially straw-coloured ones. It is a pity the pariah dogs of Turkey and India could not be converted to a similar useful purpose. In the Argentine Republic, mares by thousands are yearly butchered merely for their grease. The hides are preserved, and the carcase steamed, to produce oil. General Rosas, while in authority as President at Buenos Ayres, prohibited the killing of mares, in order not to decrease the number of horses, which in that country constitute the right arm of war in the defensive forays against the surrounding Indian tribes of Patagonia. Horses, however, in the Pampas are counted by millions; and until lately, we believe the city of Monte Video was lighted with gas made from mares' grease.

In olden times the common tallow-candle was in general use; and one of the indispensable duties of the farmer's wife, in the beginning of the winter, after the ox had been killed and the tallow tried out, was to make up the year's stock of tallow-candles. Oil and gas are now more generally used, and give a much better light. Still many prefer candles; but these are seldom manufactured now of tallow, nor are many even made

of wax; but palm-oil, cocoanut, and other solid vegetable oils, come largely into consumption for the manufacture of the hard composite candles, as they are termed; and also for soap, for which tallow heretofore was chiefly in demand.

But there is another large and important use for grease, which is for lubricating machinery and oiling the axletrees of railway carriages and trucks. In Great Britain we have somewhere about 15,000 steam-engines employed. There are 5,000 locomotives running on our railways, and 150,000 cars and trucks also traversing them. More than 5,000 steamers annually enter and quit our ports, and each of these must use about 25lbs. of grease a day, or more, according to the size of the vessel.

Railway-grease in this country is composed chiefly of tallow, palm-oil, soda, and water, in proportions suited to the period of the year. In the United States sperm-oil is chiefly used; and the cost of the oil used in 1,012 miles of railroad in the State of Massachusetts in 1851 was £15,460. Reckoning the cost of the oil on the 23,342 miles of railway now open in America at the same ratio, of about £15 per mile for the year, we have the large sum of £350,130 a year paid for lubricating railway-axes, exclusive of fixed machinery and marine engines. If we were to take the same estimate for our 8,000 miles of railway (including sidings and double lines)—although with us the consumption is probably much larger—we have £120,000 paid for railway-grease.

The abolition of the duty on soap has led to a more extended manufacture, and a larger home consumption and foreign shipments. The quantity now exported is just double what it was six or seven years ago. The foreign shipments in 1855 amounted to 203,503 cwt. What the total home consumption of soap is now it were difficult, in the absence of any data, to determine; but as the quantity charged with duty in 1851 was nearly 100,000 tons, it may be fairly estimated, taking the consumption at the ratio of 10lb. per

head per annum, and adding the quantity exported, that it is at present 133,500 tons; especially as the consumption must have increased, now that it is free of duty.

In examining the statistical returns of the last fifteen years, we find that in fish-oils—whale, and spermaceti, &c.—there has been, if anything, a decline, the annual imports having ranged from 24,000 to 16,000 tons; but in the vegetable oils the increase has been enormous. The supply of palm-oil, we believe, has doubled; cocoanut-oil has risen from 33,262 cwt. in 1841, to 252,550 cwt. last year; and our imports of olive-oil have increased sixfold: besides the extra quantities of nut-oil, rape, and other seed-oils.

Our foreign supplies of tallow have not, however, increased proportionately; for, instead of one million and a-quarter to one million and a-half hundred-weight which we were in the habit of receiving some ten or fifteen years ago, in the last four years the imports have not averaged a million hundred-weight. The war with Russia had, no doubt, much to do with this deficiency; but still it is evident that the vegetable solid-oils are taking the place to a considerable extent of the animal fats and fish oils.

This will be the more apparent by an examination of the following figures, from which it will be seen that, while the supply of vegetable oils has more than doubled in the last ten years, tallow and fish oil are nearly stationary:—

IMPORTS OF OIL INTO THE UNITED KINGDOM.

	Eleven months,	
	1846.	1855.
Cocoa-nut.. cwt.	48,322 ..	252,550 ..
Palm .....	366,852 ..	810,394 ..
Olive .....	8,532 ..	25,449 ..
Seed-oil....	— ..	7,365 ..
Fish-oil....	16,834 ..	17,357 ..
Tallow ....	1,111,818 ..	955,224 ..

The year 1846 being that following the abolition of duty on the oils, forms a fit period for comparison; but it is only of late years that palm cultivation for the production of oil has been carried out to any extent on the West Coast of Africa, and in Ceylon and India. It is several years before the tree comes into bearing.

A glance at the imports of 1855 will show the countries to which we are chiefly indebted for our supplies of foreign tallow. Russia, however, owing to the war, figures very disproportionately to former years; but the shipments came through Prussia.

IMPORTS OF TALLOW IN 1855.

Prussia .....	644,695 cwt.
Buenos Ayres .....	93,352 ..
Australia .....	52,481 ..
Russia .....	47,214 ..
United States .....	20,401 ..
Uruguay .....	21,787 ..
Hanso Towns .....	19,453 ..
Turkey .....	17,239 ..
British India .....	11,460 ..
Austrian Italy .....	6,071 ..
South Africa .....	2,798 ..
Other parts .....	15,371 ..

Total ....., 952,322 ..

To Russia and to South America we must chiefly look for our future supplies of tallow, for Australia is failing us, and she now manufactures a large proportion of her own candles and soap. While we imported 9,000 tons of tallow from New South Wales in 1850, in 1855 we received but 2,100 tons; and from all the other Australian settlements the quantity shipped scarcely exceeded 500 tons. The decline is shown by the following statement of imports from Australia:—

1850 .....	173,744 cwt.
1851 .....	174,471 ..
1852 .....	159,333 ..
1853 .....	125,186 ..
1854 .....	73,286 ..
1855 .....	52,481 ..

The increase of population in New South Wales and Victoria, consequent upon the gold discoveries, has checked the production of tallow for export, it being unnecessary now to boil down cattle and sheep for tallow alone, the flesh being also in demand for food for the increasing population, while labour is also more readily obtainable for the pastoral districts. In the nine years ending with 1852, 1,787,960 sheep, and 340,353 head of cattle were sent to the melting-pot in New South Wales alone. The numbers slaughtered for tallow in 1852 were 292,000 sheep, and 74,194 head of cattle, which yielded 147,947 cwt. There were then 72 boiling-down establishments in full activity in the colony. In the following year, 1853, the number of boiling-down establishments had diminished to 39, only about 97,000 sheep and 30,000 cattle having been boiled down, producing 64,485 cwt. of tallow. We have before us a statement of the averages realized by boiling down at the large establishment of Mr. Fleming's, at Moreton Bay, in 1853. The sheep, 8,868 in number, averaged about 23lbs. of tallow; the cattle, 5,551, yielded on the average from 111 lbs. the lowest, to 337½lbs. the highest. These figures are interesting as showing the general condition of the sheep and cattle boiled down in the district.

It is something unusual to cattle breeders and sheep farmers in this country to hear of such large flocks and herds being rendered into tallow, and their flesh wasted, except for the purposes of manure. Now, however, this sacrifice, except as regards a few diseased animals, may be said to be at an end.

Our supplies of Russian tallow come chiefly from the northern ports, but even before the late war they were decreasing. In the five years ending with 1840 we received from Russia about 60,000 tons annually. In 1849 we imported from thence but 48,730 tons; and in 1853, 42,295 tons, out of 50,200 tons, the whole quantity exported from Russia. Twenty years ago we only received from the States of the River Plate 210 tons of tallow: of late years Montevideo and Buenos Ayres have sent us on the average 8,500 tons annually. Still the supply from thence is very fluctuating, and evidently rises and falls with the ruling quotations of the English market. A consideration of the figures we have given will prove interesting both to speculators in tallow, and to cattle breeders at home and abroad.

## THE CONDITION OF THE LABOURER—PAST AND PRESENT.

The condition of the agricultural labourer, during the first two of the four periods of agricultural progress in the past century, was adverted to on a former occasion, shewing how it began to deteriorate with the consolidation of farms, the banishment of the labourer from the farm-houses, and the depriving him of all land. The completion of his ruin during the second period, by the system of relief in aid of wages, was also adverted to, as well as the hardships entailed upon those labourers who had surrounded themselves with families, in reliance on parochial relief, when that relief was taken away by the amended poor-law, without their being able to obtain an equivalent in wages. Let us now consider the position of the labourer rather more in detail, during the period of low prices and agricultural distress. Was he a gainer or a loser by those low prices? The great argument then urged in favour of protection was, that it was not for the benefit of the landowner or the farmer, but of the labourer. The opinion had become very general, even among the labourers themselves, in some of our rural districts, that high prices were beneficial to them because they got higher wages. The fact, however, was, that though the pay of the labourer might be increased from this cause, in districts where they professed to regulate wages by the price of flour, high prices were only beneficial to the single labourers, or labourers with small families, who were comparatively small consumers of bread. To the married labourers with large families low prices were advantageous. On the whole, therefore, the labourer gained by low prices in those districts where there were farmers of capital capable of employing them. It was in the backward districts, where the farmers possessed neither the necessary means nor energy, that they suffered from low prices. We have adverted, also, on former occasions, to a concurrence of circumstances which have placed the labourer, of late, on a more independent footing, as regards the value of his labour, than he had previously enjoyed—namely, the absence of Irish labour, consequent on the emigration produced by the potato blight, and the emigration of English labourers, caused by the discovery of the Australian gold-fields, as well as by the demand for labour of all kinds arising from the prosperous state of trade and manufactures, which resulted from a variety of causes. Among these causes may be enumerated the large exports of produce and manufactures to the gold districts, as well as the large exports consequent on large importations, for it does not admit of a question that the one follows the other as a natural consequence. Upon the whole, therefore, the present may be regarded as the most prosperous condition of the rural labourer, as far as wages are concerned, which he has enjoyed since the commencement of the march of agricultural improvement. At the same time it does not admit of a question, and we

confess with sorrow, that the moral and social position of the rural labourer has deteriorated most lamentably since the disappearance of small farms and the introduction of those improvements, with all the increased produce, which have resulted from the application of capital to the cultivation of the soil. There is no longer that community of feeling between the employer and the employed which prevailed when they were more on an equality, lived and worked more together, and were not unfrequently connected by ties of consanguinity or alliance. None know better than the clergy the mutual want of confidence which prevails at present between the farmer and those whom he employs.

It is admitted, by all who have paid attention to the subject, that one of the greatest evils which the labourer suffers arises from the want of a dwelling, in which a family can be accommodated without violation of the decencies of life. Are any efforts being made to remedy this evil? We fear it must be confessed they are few. On the contrary, are there not many districts where the clearance of cottages is systematically carried on, in order to save those who have benefited by the toil of the labourer when in health, from the burthen of giving him that support in sickness and old age? A claim which the law admits, but which he ought not to require, under a proper system of wages and a better system of relationship between the farmer and the labourer, accompanied by the return of those provident habits, and that feeling of independence and dislike of parochial relief which once distinguished him? Nothing can be more shortsighted policy than the banishment of the labourer's residence from the scene of his labours. It is well known that in many districts they reside in towns, or villages, four or five miles from the farms on which they work. The farmers complain of this with justice, and blame the landlords for it. It is a loss to both parties. The farmers, of course, cannot obtain so much work from a labourer who performs the labour of half a day, at least, in going to his work and returning from it, as from him who resides upon the farm. As a matter of policy, therefore, putting higher considerations out of the question, cottages of sufficient number to accommodate all the labourers which the particular kind of husbandry pursued in the neighbourhood requires, ought to be considered quite as much a portion of the farm-buildings necessary for the proper occupation of the land, as barns, stables, or cattle-sheds.

The moral advantages are no less important. What a check it would be on that drunkenness, which is so often denounced and deplored as the besetting sin of our labouring population, if they resided under the immediate eye of their employer, always supposing the latter to be—as we are persuaded that he would be, in the majority of cases—a sober man himself! How



much friendly intercourse, how many little good offices must arise out of such contiguity!

Another step, in all attempts to improve the condition of the farm-labourer—scarcely less important than the furnishing of decent and comfortable dwellings—is the connexion of good cottage-gardens with those dwellings, and the restoration to the labourer of that interest in the land arising from the possession and cultivation of it on his own account, and of which he was deprived at the commencement of the present century. It was then we saw every cottage-garden thrown relentlessly into the large farm, either to square its boundaries, or because the possession of land was deemed detrimental to the labourer's honesty, by tempting him to steal his master's produce. This is a prejudice which has not wholly subsided, though it is fast diminishing. The best security for the labourer's honesty would be to teach him the duty of being honest, rather than to deprive him of land in order to keep him so. The modern system, however, of thrash-

ing by machinery obviates this objection by the celerity which the operation is performed in public, and the produce secured in the granary.

With respect to dwellings for the labourer near his work, and the possession of a small portion of land, the landowners and the farmers are on opposite tacks. The farmers, for their own sakes, wish his dwelling to be near his work, but do not approve of his holding land. On the other hand, the landowner, while he pulls down the labourer's cottage and drives him into the town, denounces the jealousy, entertained by the farmer of the cultivation of even a small portion of land by the labourer. Between the two, and the exertions of the clergy, has arisen the much vaunted allotment system. As a palliative it is admissible; but it is a very poor substitute for the cottage-garden, with its fruits, its flowers, and its bee-hives, and all their moral influences. It is the want of these, and other innocent recreations for his hours of leisure, which drives the labourer to the beer-shop.

## FACTS CONCERNING THE WORKPEOPLE OF EUROPE.

Much in our day has been, and is, both written and spoken concerning social science. The bearings of the subject seem to be infinite; and this is so because every progressive movement is attended with new and unforeseen evils. As we advance in civilization we are again and again reminded that no human state can be a perfect state. Our very reforms have counter-disadvantages, needing in time to be themselves reformed; frequently they open up difficulties we never dreamed of. For instance, when one looks abstractedly at the Enclosure Act, it appears to be almost an unmixed good; but, viewed from its actual effects, it is very far from deserving such a character. Farms are larger, and perhaps more productive; but this doubtful good develops an element of danger amongst us. That gradation of ranks so essential to a thriving community is being done away, and all classes are becoming merged into two great divisions—the few capitalists, immensely rich; and the many labourers, hopelessly and pitifully poor. Our student of social science has, therefore, to compound an antidote for this new danger to the Commonwealth; and in dealing with this the statesman will probably start a fresh one, so that in truth the pen of the thinker and the tongue of the speaker shall never be able to say, “now is my work completed.”

What an amount of pamphleteering has the labour question given rise to! Let any one go to the British Museum, and I will venture to say that he will find one-fortieth of the ten miles of book-shelves occupied by works bearing directly or indirectly on that subject. Consult Hansard, and dreary will be the vast wastes of speechification over which you will have to travel.

Now, we are of opinion that, in spite of all this written and spoken wisdom, there yet remains much to be said on the conditions and modes of human labour; and as these must perpetually change with a progressive

civilization, the social practician and theorist will never want a subject.

It strikes us that some profitable theories might be elucidated from what is known of the industrial facts concerning the workmen of Europe. We imagine an observing man passing from one country to another, acquiring in each an intimate knowledge of the relations masters and servants, capitalists and labourers, hold to one another, and much more information of this sort; and then founding on these facts, by a species of induction, certain general laws. This process we have never seen; and we cannot but think that, carefully undertaken, it would go far to assert the truth of certain principles we are in constant danger of over-riding, to our imminent peril, and would also establish social science more firmly in public estimation.

In a brief way, let us just see how this subject might be treated.

We observe, in the first place, on the degrees that now exist in the industrial hierarchy, commencing with that of domestic labourer, and ending with that of proprietor. The possible development of each grade is absolutely limited, and examples of all are found in Europe. There seem to be four systems to which the industrial classes belong. First we have Nomades, the primitive form of society, represented by the inhabitants of the Oural Mountains, the plains of Sahara, and the countries of the Caspian. Secondly, we have the *adscripti glebæ*, or compulsory engagements: examples of these we find in Russia, in Turkey, and in Hungary. Thirdly, there is the voluntary permanent engagements of Scandinavia and Germany. And, lastly, what may be called the momentary engagement, or complete individual liberty, now found in England and France.

These systems are all now at work, so that we need

not go back in order to ascertain their peculiar advantages and disadvantages; for, doubtless, they all, in common with every human arrangement, possess them both. Examples of every grade of labourers are to be found in each system; and as it is the function of the statesman to discover the principles which tend to elevate workmen from the lower to the higher steps of the industrial hierarchy, it is no less his duty, and the duty of all employers of labour, to examine the different changes which the social systems of Europe have undergone, that society may lose nothing of the past which is beneficial, but carry through its more advanced stages everything of tradition calculated to promote the well-being of the population.

So late as 1788 the *tiers état*, or common people, of France were in a very depressed and miserable state. They were liable to be called to work on the high road a certain number of days in the year, and were in different ways subject to the nobles, who continued to hold their ancient manorial or patrimonial jurisdiction. The common people being anciently slaves, had obtained their freedom upon different conditions. In many places they and their posterity remained bound to pay a perpetual tribute to their feudal lords, and such tribute formed a considerable part of the revenue of many of the provincial nobles. And from this Russian system of communal labour and permanent contract between the labourers and the lord of the soil, France has not long broken away. A good authority tells us that the community of Jault experienced this system so late as 1840. We add, too, what may be more amazing, that so recently as the latter part of the eighteenth century the colliers of Scotland were bondsmen, their services being bought and sold with the soil they vegetated on. There was at that time even a law current, that dealt with a mere truant as with a common malefactor!

Now the inquiry as to the circumstances or influences carrying England and France away from this species of servitude must be interesting, as well as those which at the same time preserved it in Russia. In other words we cannot fail to derive instruction from observing what principles there are at work forcing society through this cycle.

A little thought must convince us that the Nomade tribes belong rather to Asia than to Europe. There are geographical as well as physical reasons for this. Judging from the similarity that exists between the communal habits of these tribes, and those of the Russian serfs, they are destined to coalesce with that power. The lines of the Russian territory have been extended in consequence of a process of absorption that has been vigorously going on—a process that reminds us of the force of the attraction of gravitation exerted by a large body over several smaller ones placed within the influence of its power. We can see how extensively Russia has operated on those tribes, when we consider the position of her south-eastern boundary, in comparison with what it was. It is constantly the case that Tartar tribes and distinction of race are being lost along her frontier lines. Over them she extends the Ægis of her laws, and they gratefully in return own her protection, and to ratify the bargain, perhaps, make her a present of a sheep per

family. The Nomades on this side are, therefore, soon likely to be absorbed, and throwing off their vagrant habits, to subside into the one uniform Russian system of compulsory engagement. This appears to be the first step in the process of civilization, and it seems strange that Russia who has done much to uncivilize Europe in certain parts, should be initiating the Tartar tribes into the first forms of it: *Aggrandizement*, however, is her motto, *not civilization*.

The Tartars live in considerable bodies, supported by their herds. When several tribes unite, as is the case when one chief has subdued many others, they often set out with the design of making a great conquest in some empire to the south. It was one of these re-unions and armed descents that formed in old Muscovy the nucleus of the present Russian empire. This northern migration was attended by a necessary process of infudation, growing subsequently to the power to achieve great conquests. The Tartars never conquered as *freemen*, but as slaves; for by particular circumstances of life they are involved in a political slavery, common to eastern populations; and although their habits were gradually mitigated by occasional contact with the generous Goths, they yet retained an inherent love of governing by the cudgel and the whip. This Asiatic spirit of tyranny in the masters and servility in the people is yet very manifest, and is abhorrent to the instincts of Europeans, who regard as outrageous abuses what eastern people term punishment.

Land was bestowed upon individuals as a species of benefice for military tenure, and on communities in return for certain manual service. This latter was sometimes exacted without the assignment of territory, the allodial proprietor engaging only to provide for the social welfare of his serfs. The great German hordes employed precisely the same means, followed by results differing only by reason of the difference in character between the Tartar and the Goth, and hence the system of compulsory engagements became general over Europe. The advantages and disadvantages of the system are very apparent. The commonly, while possessing a certain degree of physical comfort, are dead in the eye of the law. The will of their masters in all things is an inexorable law to them. No arrangement, supposing the proprietors to be benevolent and the serfs improvident, could be better; while no worse arrangement could be imagined, supposing the proprietary unconscious of responsibility and the serfs self-reliant. The idea is quite antagonistic to Nature. Moreover, where the lord and the serf occupy the relative position we have last supposed, there must exist peculiar danger to the form of government that perpetuates the injustice; and it is the fear that the principles of liberty and independence existing elsewhere may be infused into any large body of the serfs, that renders Russia, &c., so anxious to distance constitutionalism and deter foreign intercourse with its people. Under a system of free labour there is distress enough, we know; but there is an open path to every man desirous to mount to any position in society to which his abilities can convey him. But under the compulsory system of engagement, though distress is modified and pauperism is unknown, men cannot stray out of the orbit in which they are born. Once a slave always a slave, is the common rule, to which there are but few exceptions. F. R. S.

## ANNUAL REPORT OF THE LINSEED AND OIL-CAKE TRADE.

Str.—The past year has been one of such surpassing interest as regards the article of Linseed and its products, that we feel sure our present annual circular will prove worth your attentive perusal and consideration; the trade presenting an enlarged aspect every season, owing to the growing mill power, which has quadrupled within the last fourteen years. When we had this pleasure twelve months since, we were at war with the country usually supplying three-fourths of the entire growth of the world, and to judge from the warlike preparations then making, were likely to be dependent on our East Indian possessions for our wants until now. The unexpected acceptance by our enemy of the proposed conditions of peace staggered us all for a time; and although we then believed, and named to our friends also, that the disorganization of her resources must curtail our chief Russian supply for this season's use, all considerations, except that of getting out of stock, seemed disregarded, and the immediate fall in prices, rally, and subsequent panic which ensued, together with the gradual and permanent return to nearly previous rates, render the year 1856 a memorable one in the history of seed-crushing. The losses in the first six months must have been most serious; but following on prosperous times, and succeeded by a usually profitable working season up to this date, the trade was probably never in a healthier condition.

Our retrospect is interesting, from the various fluctuations which have occurred, and we wish we could add also that the prospect of future supply was a subject for congratulation; but from all we can learn, and which we particularize hereafter, we fear the prospects for 1857-8 are anything but encouraging for the manufacturer.

We purpose this year to continue Calcutta seed as the standard of price, and also to subjoin, instead of prefacing, the customary statistics of imports, &c., as heretofore; we beg at once, therefore, to call your attention to

**LINSEED.**—The year opened with a light stock, and a quiet but firm market, at 76s.; and but for the perplexity as to political matters, there was a disposition on the part of crushers to purchase at that rate. Their doubt was of short duration, however, for by the middle of January the important announcement had been made, and the prospect of peace sent the market instantly to 70s., and before the end of the month to 62s. Each succeeding sale marked a lower price, and it was not until we had reached a value similar to that touched in 1855 (when the news of the Czar's death arrived)—namely 56s.—that there was any return to confidence. A gradual improvement afterwards followed, up to 60s. per quarter, and for several weeks we had a steady business doing at that figure. Early in April, the serious fall in cakes and oil which had occurred (equal to 25s. per qr. for seed), together with the unfortunate failure of one of the largest holders of seed, caused a perfect panic in prices, and as low as 47s. was accepted to realize some of the seed upon which advances had been made. This was hardly to be wondered at, as the season might then be considered over, and for the one ensuing contracts were offered, and several entered into, at the same price for autumn arrival. Presently, however, seed on the spot was found very scarce, and an immediate reaction to 50s. followed, and was well sustained throughout April, May, and June, with a strong tendency to further improvement. In July the anxiety to provide for future wants showed the soundness of the market, and before that month closed we had advanced to 57s., which price, with very few fluctuations, was maintained until the middle of October. At this period the decreasing shipments from India, and now apparent short supplies from the south of Russia, caused a very speculative demand, and 63s. was realized on the spot, and 65s. to 66s. for floating cargoes of Black Sea. The market has scarcely varied since, except prices for arrival, which have been flat at 1s. to 2s. decline, whilst seed on hand has been firm at same rates. The depression in oil and cakes has deterred speculators from continuing their operations, and crushers could hardly be expected to compete with them whilst there was a certain loss of 3s. to 4s. per qr. at the relative value for crushing. The lowest forward contracts of the year were of Archangel seed, free on board at 34s. to 35s.; good

crushing Riga, 33s.; and Morshansky, at 39s. to 40s. Black Sea seed has followed the value of Calcutta, and being in cargoes available for export delivery, it has generally obtained a preference of 1s. to 1s. 6d. per qr. In East India seed very little has been done until arrival, merchants being most reluctant sellers in the face of the heavy loss accruing on all this year's imports from that quarter. We have a critical period before us, both in respect of the remainder of this season and of the next. We have about 140,000 qrs. in stock here and at Hull, and nearly 150,000 qrs. afloat, to supply the demand until May next. As, however, we have imported above 300,000 qrs. during the last six months, the majority of crushers are well supplied, and, notwithstanding the great consumption within that period, hold above average stocks for the time of year. The very discouraging prospects for 1857-58 must, however, exercise a great influence even on present prices; for, we regret to say, from no one district in Russia is the crop well spoken of, but, on the contrary, everywhere are we led to expect short supplies, and, owing to the heavy rains during the late harvest, indifferent quality also. At the East Indies the competition of the Americans for their yearly-increasing wants makes us hope for but little to this country, unless it should happen that the higher foreign values induce the natives to supply their markets more freely again, and that our improving prices, setting off against the decline in America, may divert the shipments to this channel. The export at Calcutta since May last consisted of 160,000 qrs, to America against 20,000 qrs. to England, or eight times as much; whilst in 1855, during the same period, our supply was nearly double theirs, or 200,000 qrs. to 100,000 qrs. So striking a fact requires no comment beyond the simple relation of it, and we leave you to form your own conclusions as to what must be the eventual result. In the autumn profitable transshipments of seed took place from here to New York, and, from the tendency of their markets (according to the latest quotations), it is not improbable they may very soon return the compliment.

We can scarcely expect to see our home trade remain much longer in its present very anomalous condition, for with the probability of dear seed, speculative sales are making of oil, so that if cakes are to continue at their present value, and that article is not to mend, there will be no choice left to those crushers who are unsupplied with seed but to close their mills, unless they are enabled to purchase it on more favourable terms than at present seems likely to be the case.

The quality of the Calcutta seed was a trifle better than that of the previous year. Bombay maintains its high character. Black Sea has been various, the bulk consisting of old seed and being but indifferent. Fine Petersburg has been very good, but the secondary sorts of a most unsatisfactory description. Riga and Archangel quite up to their former averages.

The present stock in public warehouses here consists of 49,500 qrs.—namely, 21,000 Calcutta, 15,000 Bombay, 8,000 Black Sea, 2,500 Archangel, and 3,000 Baltic, &c. At Hull it is said to be 90,000 qrs.

Afloat, the quantity already named consists of 100,000 qrs. Black Sea and Mediterranean transshipments, 10,000 qrs. Calcutta, 6,000 Bombay, 8,000 Alexandria, and 10,000 Baltic, Archangel and sundries.

The import into London is somewhat under that of 1855—namely, 265,113 qrs. against 306,245 qrs. The aggregate into the United Kingdom amounts to more than 1,100,000 qrs., being almost one-half greater than last year, or the average of the preceding seven years. The comparative official returns are as follow—say, from January to December:—

Qrs.			Qrs.		
1841	...	363,461	1849	...	626,490
1842	...	367,600	1850	...	608,984
1843	...	470,539	1851	...	630,471
1844	...	616,947	1852	...	799,402
1845	...	656,793	1853	...	1,035,335
1846	...	506,141	1854	...	828,513
1847	...	439,512	1855	...	756,950
1848	...	799,650	1856	about	1,100,000

The season's import—that is to say, July to June—was as under, namely—

1848-49 } .....	700,000 qrs.
1850-51 } .....	
1851-52 } .....	
1849-50. ....	600,000 "
1852-53. ....	825,000 "
1853-54. ....	1,030,000 "
1854-55. ....	1,006,000 "
1855-56. ....	644,000 "
1856-57 will probably be. ....	1,250,000 "

The supply to this port consisted of 162,000 qrs. from Calcutta, 55,000 qrs. Bombay, 20,500 qrs. Black Sea and Mediterranean shipments (including the early imports of Bessarabia sent by way of the Danube), 3,000 qrs. Alexandria, 8,000 qrs. Archangel, 16,500 qrs. Baltic ports and sundries.

The aggregate import to United Kingdom again shows a marked alteration in our sources of supply, the East Indies having fallen off one-fourth, whilst the Northern Russian ports have furnished the deficiency, and likewise added a surplus, which brings the import 400,000 qrs. in excess of 1855. It was made up of about 225,000 qrs. Calcutta, 85,000 qrs. Bombay, 260,000 qrs. Petersburg, 68,000 qrs. Archangel, 125,000 qrs. Riga (15,000 qrs. sowing, and 110,000 qrs. crushing), 140,000 qrs. Memel, Königsberg, and sundry Baltic ports; 35,000 qrs. from Alexandria, and 184,500 qrs. Black Sea, the latter discharging as follows:—Hull, 50,000 qrs.; Liverpool, 28,000 qrs.; London, 20,500 qrs.; Grimsby, 14,500 qrs.; Southampton and Ipswich, 13,500 qrs.; Dover, 12,000 qrs.; Yarmouth, 8,500 qrs.; Lowestoft, 7,800 qrs.; Rochester, 5,100 qrs.; Newcastle, 3,800 qrs.; Lynn, 3,000 qrs.; Gloucester, 2,600 qrs.; Dublin, 1,700 qrs. Belgium likewise took nearly 30,000 qrs., Holland 10,000 qrs., and France 2,000 qrs.

The re-export, which nearly all took place in the early months of the year, amounted to about 45,000 qrs., against 130,000 qrs. in 1855, 70,000 qrs. in 1854, 55,000 qrs. in 1853, and 30,000 qrs. in 1852; St. Petersburg also sent direct to the various continental ports 110,000 qrs.: Archangel, 50,000 qrs.; Riga, 45,000 qrs. of sowing, and 55,004 qrs. of crushing seed. The Lower Baltic shipments for the same destinations must likewise have been heavy.

LINSEED OIL has remarkably fulfilled our expectations in the course it has run since our last annual circular was issued, and the causes of the fluctuations have been more definable than for many previous years. Our market in 1855 closed firmly at £12 10s., and with so continuous a demand, short stocks, and probable small supply of seed, we considered "an immediate peace would not be likely permanently to depreciate its value for some months." The correctness of that view was fully borne out by the end of September, when oil again realized that price; and it would not surprise us now, owing to the various influences at work, to find it similarly quoted before we again have this pleasure. Directly the year opened, prices advanced to £14 on the spot, with buyers for future delivery at £15; but as the then demand was chiefly speculative, the value was hardly maintained after the first few days, and a decline of 10s. to 15s. per ton occurred. The notable announcement of the 17th January upset the market most effectually, and the first transaction was £10, the second at about £87, and the market continued to decline until it touched £33, the middle of February. So sudden a fall of 25 per cent. encouraged purchases, and by this time also a great clearance having been made of the stocks of speculative holders, the price steadied to £36 towards the end of the month. The improvement was not maintained, for no one would buy a gallon more than he could help (with forward oil offered at £6 per ton less!) and we relapsed to £34 in the month of March. The demand was all along good, and oil very scarce. Early in April some failures occasioned several parcels to be suddenly thrown upon the market, and a similar panic to that in seed ensued, £29 being a current price at the end of the month. At this period also, several crushers having secured cheap seed, realized their oil at £28 to £30 for autumn delivery, and were followed by speculative sellers at 20s. to 30s. per ton less money. When May came, the diminished make of the previous month began to tell, and, with a fair export trade, we improved to £32. During June, the paucity of stock again became more apparent, and we improved a further 40s. per ton. In July, although buyers held off until

the latest moment, it was scarcer than ever, and the closing of the "Bear" operations for future delivery just alluded to improved it to £38, and even £40 for some contracts. August prices were £38 on the spot, £33 last three months, and £31 10s. for 1857 deliveries, and at each price in great request. In September the continued export and home demand improved the value of £42 10s., but the market was very unsteady, being much influenced by the speculative account then open; and the same remarks apply to October, during which month the value fluctuated between £37 10s. and £41. The forward price had improved by this time to £39 for November and December, and £38 for first three months' delivery. In November the market was quiet, at about £38 10s., but oil even then unquestionably scarce; and last month, notwithstanding an evident disposition on the part of the trade to go into stock, as low as £37 was accepted. The latter result was occasioned chiefly by large speculative sales for spring delivery, at about the same price; and it was only natural that consumers should prefer such purchases, and so save the cost of holding. The high value of seed deters crushers from entering into such contracts; and if the present export holds, we may see as great a reaction when the period for delivery arrives, as we did a few months since.

The exportation has been enormous, the bulk of it having gone to Germany, and chiefly in substitution of fish oils and tallow, both for soap-making purposes and burning. As it is still relatively cheaper than either of these articles, as well as rape oil, a continuance of shipments is very probable.

The progressive increase is deserving marked attention. In 1848 it was only 11,000 tons; in 1851, 13,500 tons; and in 1854, 15,500 tons; then 17,500 tons; and last year, the extraordinary quantity of nearly 30,000 tons.

LINSEED CAKES require but little comment. Prices have been chiefly regulated by the value of seed, and are likely to be so more than ever, we believe, in the ensuing season. The demand hitherto has been very regular, and consumption fully up to any previous season. £13 per ton was the opening price in January, about £12 directly the peace news came, and it afterwards dwindled to £10 in April, and continued so until seed had partly recovered the decline, when it improved to £10 15s. to £11 per ton: since November, however, it has been flat, and above £10 10s. scarcely obtainable. With regard to the future course of prices, it is most difficult to give an opinion. We can only refer back to our concluding remarks on the article of linseed.

OF FOREIGN CAKES the import last year was about on a par with that of the two previous ones. The trade opened in January with a good demand, at £14 per ton for barrel American, £13 10s. bags, and £12 10s. for Marseilles. This continued throughout the month; but early in February prices began to recede, and continued to do so until the end of May, when they touched bottom, the decline then being fully £3 10s. per ton upon the opening rates. About this time, and early in June, the dealers came forward freely to supply future wants, and several large contracts were entered into for shipment to the end of the year. cargoes, Marseilles, October to January shipment, were done at £5 5s. to £9, cost, freight, and insurance, barrel American £10, cost, freight, and insurance, and bags £9 5s., cost, freight, and insurance. At the end of June, the demand continuing, sellers were enabled to advance their prices 20s. per ton, at which a good business was done; and by the middle of July a further 10s. per ton was obtained. In August, we had a fair demand, at a trifling advance on previous rates, which continued with a steady trade, at same figures, until November. Last month, in consequence of the heavy arrivals and importers' desire to realise, a reduction took place of about 15s. per ton, and dealers bought freely thereof. The market shows again signs of increased demand, and prices are to-day a trifle firmer, say, best New York, brls. £11 5s., bags £10 5s., and Marseilles £9, cost, freight, and insurance.

Rapessed and other oil seeds are again greatly in excess of last or any previous year, being 225,000 qrs. into this port alone, and into the United Kingdom about 260,000 qrs. The re-export, however, amounts to nearly 150,000 qrs., against 96,000 last year, and 17,000 qrs. in 1854; so that the quantity left for home consumption has not varied much.

The year opened with a quiet market at 73s., and it very quickly dropped to 65s. on the first announcement of peace. By March it had receded to 60s., and at that time good-con-

detailed seed was so scarce, and so necessary for working up the immense quantity of heated sorts on hand, that it rallied to 64s., and was afterwards steady for some time at about 62s. After April it declined very rapidly, and some sales occurred as low as 53s.; a sharp re-action followed, and it again recovered to 65s. in July, since when we have had dull markets at 64s. to 62s. The value of to-day is 63s., with a fair stock, and only moderate demand. In the spring of the year nearly all the Calcutta seed arrived in a heated state, and the grain, which to outward appearance was sound, was, on breaking, found burnt and discoloured to such an extent as to depreciate the value from 25 to 50 per cent., and considerable sales were made at those reductions. Fine Bombay seed has realised 3s. to 5s. per qr. more than the best Calcutta, and is still much in favour. On arrival, the value has generally been a trifle below that current on the spot. The stock now in warehouse consists of about 30,000 qrs., against 5,000 qrs. in 1855. On the other hand, however, the quantity afloat is only 35,000 qrs., whereas then it was 130,000 qrs.

Other oil-seeds bear the following quotations:—Sesame, teal, and gingelly, 58s. to 63s.; poppy, 62s.; niger, 46s., with moderate stocks on hand. Rape-oil, the import is about the same as during the previous year, and the trade has been unusually steady.

The value of English refined at the time our last circular was published, stood at £60 per ton. In common, however, with all articles influenced by the cessation of the war, that quotation very rapidly declined to £19. It rallied back to £53, in March, and by May (that is, at the close of the season) had declined again to £45, and even £44. In July it had again run up to £53, and the fluctuations have been but trifling ever since—that price, up to £54, being our quotation to-day.

RAPE CAKES.—The course of prices has closely followed that of linseed-cakes, to which article it seems constantly now to bear a relative value. £7 10s. was the value in January, and it receded rapidly to £6 before March. At the close of the season £5 was the price, and even £4 was accepted for indifferent qualities made of heated East India seed. Until October no change took place, but we have since gradually improved, and £6 to £6 10s. is to-day's price for fine green foreign makes.

FISH OILS have again experienced considerable fluctuations, and in the case of SPERM OIL a very serious decline. £127 was January's value, and it has declined steadily, month by month, until it now marks only £88 per tun. PALE SEAL

opened at £57, declined to £48 by July, recovered to £61 in November, and has since barely supported that value. SOUTHERN.—The present price is £51, it was the same last January, and has been nearly as dear throughout the year, the exceptive months being March to June, when it realized only £46 to £47. COD OIL also marks the same value as at this period in 1855, namely, £49. In April it was as low as £42, but gradually improved up to November, and was once quoted £52, but this figure has been barely maintained since.

SPIRITS OF TURPENTINE was a dragging sale during the past year, at from 31s. 6d. to 35s. 6d., being quoted lowest in May and July, and highest in February. Within the last few days, however, a speculative demand drove it rapidly up to 49s. 6d., but this price has not been supported, and the nearest value to-day is 47s. 6d.

TALLOW.—We need hardly say that tallow, at all times one of the most speculative articles of commerce, has been peculiarly so during the past twelve months. Scarcely a week has elapsed without violent fluctuations; and even now, when we might have expected them to subside, they are as frequent, although perhaps not so heavy, as when we were in a state of war. £68 was January's earliest quotation, £56 a few days afterwards, then £60, and at the close of the month £53 sellers. During February it ranged from £57 to £61 10s. for P.Y.C. (sorts, however, selling at very disproportionate prices). The value of P.Y.C. was kept up by the combination of a few speculators to take *all* the tallow previously contracted for; and as it was known to be a heavily over-sold account, they expected to run prices to such a pitch as to compensate themselves for the certain decline after the time-bargains were closed. The speculation broke down, however, before March closed; and there was scarcely an intermediate price between £57 and £47. During April, May, and June, it declined to £45. In July it was £47 to £53; August, £51 to £54; September, £50 to £53; October, £51 to £57 10s. In November it was daily quoted differently, ranging from £55 to £59 10s.; and last month, the lowest price touched was £57. The market continues in a most feverish condition, £59 having been the quotation on Monday, and to-day's price is £58. The stock is but small; and, heavy speculative contracts remaining open for spring delivery, we shall probably have very irregular markets for some time to come.

London, Jan. 1.

EDWARDS, EASTY, & CO.

## TRADE OF THE PORT OF HULL.

### REPORT FOR THE YEAR 1856.

With the issue of the Annual Report it must be remarked that the past year has been characterized by an extraordinary increase of the trade of this port, and founded on such a legitimate basis as to give every prospect of a progressive continuance. Articles of annual produce must naturally be governed by results of harvests, but the consumptive demand of this country is certainly proved to be enormously increased, and must be supplied either by home or foreign produce. The requirements of foreign nations for many articles of the manufactures of this country have likewise shewn themselves beyond any former precedent, and greatly of those articles which this country has the advantage of producing more favourably than any other, and for the export of which this port offers the greatest facilities.

The return of peace after the two years' war with Russia has materially led to a great extension of business between this port and that country. Certain of its products, which could bear the charges of transport, such as flax, hemp, and tallow, having been allowed by our government to reach us through Prussian ports, may be considered as exceptions, but grain, linseed, iron, deals, tar, and other articles which did not find their way across the frontier, have been largely imported here during the year.

The tonnage entering the port during the year amounts to 1,076,787, against 782,411 last year, and 850,229 in 1854. The number of ships and vessels reported inward on foreign voyages is this year 3,157, and tonnage 743,517, whilst last year

the number was 2,123, and tonnage 468,047, shewing an increase of 1,034 vessels, and 275,470 tons. The tonnage of steam ships in the foreign trade was, in 1855, 14,392, whilst this year it amounts to 28,229, shewing an increase of 13,837 tons, or nearly double the previous year's steam tonnage.

The necessity of further dock and shed accommodation has induced the dock company to apply for power to enlarge their works, and it is expected that no time will be lost in entering upon their construction.

It may be allowed here to call the attention of our merchants and shipowners, as well as the more important agricultural and manufacturing interests of Lancashire, Yorkshire, and the Midland Counties, to the reported, and it is to be feared too successful, attempts on the part of powerful railway companies to possess themselves of the great inland or canal navigation of these districts. The interests of commerce generally demand that the great carrying trade of this country should not be placed in the hands of any single body of men, however able and honest they may prove themselves to be. A monopoly so gigantic in its nature is ominous of fearful consequences, against which it is impossible to be too much upon our guard. With legitimate competition no port can rival this in despatch or moderation of charges on goods in store or in transit, and it remains with our local railways and dock company to provide sufficient room and accommodation for its increasing trade, involving as that does to a certain extent the future prosperity of the port.

GRAIN.—The favourable change of circumstances above alluded to has had a marked effect on the value of all sorts of cereal produce, and we close this year with prices very much in favour of the consumer as compared with last. These would, unquestionably, have been still lower, but for the more extended consumption in this country, and the failure of the crops in Southern Europe. With regard to WHEAT, not only in this country, but in France, Holland, Belgium, and the States of the Church, the prices have ruled high throughout the year; arising in those countries from a deficiency of the crops, and in this from a more extensive consumption among the working classes generally, whose constant employment and good wages have created a demand which liberal supplies of both home and foreign Wheat have only kept pace with. As soon as hostilities ceased with Russia, large shipments were made from that country, which met the increasing demand, arising from the deficiency in last year's crop. From the other Baltic ports the arrivals were much less than usual, and the Black Sea and Mediterranean supplies were almost entirely swallowed up by the demand for France and the South of Europe.

The crop of Wheat in this country would doubtless have been large, and of fine quality, but for the prevalence of heavy rains about harvest. Much was carried in good condition in this quarter, but north of the Humber a large quantity remained in the field exposed for weeks together to the most untoward weather that has been experienced for many years past. The result has undoubtedly been that the last Wheat crop, both as to quantity and quality, is decidedly under an average. During negotiations for peace some fluctuation in price was experienced, and when the announcement was made, our market was but slightly affected. At this time the value of fine red English was 67s. to 70s. (63lbs.); Danish and Hambro' about the same; Königsberg and Danzig white 78s. (60lbs.) The arrival in April of several cargoes from the Mediterranean, combined with the fair deliveries of home-grown, caused a slight depression in prices; they had, however, reached a point which induced our farmers to withhold supplies, and importers to warehouse, rather than submit to any further reduction. In June the Russian Wheat began to make its appearance, value 60s. for soft. In the end of this month quotations advanced to 65s. for good soft Russian; good mixed Danzig 80s.; and the market bare of other foreign. During the following month the trade fluctuated with the weather, which, being variable, prices became more firm. A brilliant sun in the beginning of August, with fine forcing weather, soon left sellers almost at the mercy of buyers, and a mere hand-to-mouth business ensued at a decline of 6s. to 8s. per qr. on the sales of the previous month, the result of the operations of a few timid holders, who, acting on the *saure qui peut* principle, determined to get out at any sacrifice. Harvest commenced in the middle of September in this quarter, interrupted by occasional stormy weather, sufficient, however, to create more firmness on the part of our farmers and holders of foreign Wheat, although the import about this time, particularly of Russian, was liberal. Up to the end of the month the weather, which was then very unsettled, interfered to some extent with the progress of the harvest; samples of new Wheat, nevertheless, soon made their appearance in our market, the quality of which was generally fine, red bringing 60s. to 65s., and white 70s. to 72s. per qr. At this time Danish and Hambro' red was worth 60s., Königsberg and Danzig white 72s. to 75s., and Russian soft 58s. to 60s.

By the end of September harvest operations in these districts were almost completed; the quality generally may be said to be fair, the yield rather less than an average, in consequence of a portion having been indifferently secured. On the whole, we have no reason to complain; and had the harvest in other parts of the kingdom been equally favourable, there is little doubt but a good average crop would have been the result. Complaints of the Potato disease made about this time, too general to be ignored, combined with a demand for the continent, had their effect on prices; but as this demand was confined chiefly to hard Wheats, other qualities were little influenced thereby. During the months of November and December the demand was slow, and prices had declined to 56s. to 60s. for new red English, and 65s. for mixed Danzig, whilst new Baltic was quoted 58s. to 60s., and Russian soft 56s., hard 68s., at about

which rates the year closes. The stocks of Wheat in this country and on the continent at the beginning of last harvest were under an average; the war had left its effects on Southern Russia and Turkey; the rains and inundations in France, the failure of the crops in Spain, Portugal, and the Papal dominions, added to the advancing population and greatly increased consumptive demand on the part of the working classes of the country, all combine to negative the idea of any decline; whilst, on the other hand, the still comparatively high range of prices all over Europe, which may lead to a greater breadth of land being sown, the splendid seed time which has been experienced in this country, and the favourable accounts of the crop and large imports from the United States, tend to the expectation that the staple article of the food of the people is not likely to be greatly enhanced above its present value.

BARLEY has this year regained its wonted important position amongst the chief imports of the port. The supplies from abroad have been large, say 159,820 qrs., against 27,069 qrs. only in 1855; but the requirements of the district have been to a corresponding extent, and a ready sale throughout the year has generally been effected from ship-board; this at least applies to all good malting and feeding descriptions, whilst of the latter kind some Mediterranean has been and still remains warehoused. Soon after the turn of the year it became manifest that the inland crop was fast working up, but these shortcomings were for several months made up by adequate importations from Denmark and other countries; and prices remained about stationary until the middle of the year, when the imports from abroad also fell off, and a gradual advance ensued in consequence, which in the month of September amounted to 5s. to 6s. per qr. (being altogether 8s. to 9s. above the lowest period, viz. in March). Since then the good accounts and subsequent large deliveries from Denmark and Northern Germany have, in spite of a deficient home crop, checked prices, which again have lost the above-mentioned advance, and now range about the same as six months ago—39s. to 40s. per qr. (54lb.) for usual foreign malting, and 34s. to 36s. per qr. (52lb.) for grinding, against 39s. to 40s. and 37s. to 38s. respectively at this period last year. Fine foreign Chevalier, Saale, and English malting Barley, being unusually scarce, is at present worth 46s. to 48s. per qr. (56lb.) It is a feature worthy of remark, that this article at the present time is worth as much or more than it was at the end of last year, whilst all other kinds of grain are from 10 to 30 per cent. lower now than then—viz., Wheat about 20s., Oats 3s. to 4s., Beans 10s., and Peas 11s. to 12s. per qr. The stocks are rather large, say 31,500 qrs., against 3,000 qrs. at the end of last year, but mostly Mediterranean.

OATS have shewn but little fluctuation during the present year. The supplies have been to a fair extent, amounting in the aggregate to 42,045 qrs. (in which are included several cargoes from Russia) against 36,059 qrs. last year. The dealings have been of a purely consumptive character, and prices have barely varied 5s. from the highest to the lowest point throughout the year, and they now leave off at 26s. to 28s. per qr. (42lb.) against 29s. to 31s. some time last year. The present stocks in the port are 3,000 qrs., against 3,600 qrs. in 1855.

BEANS have been imported to a much larger extent than last year, 69,756 qrs. to 42,050 qrs. A drop in the prices took place at the commencement of the year, from which, however, a gradual recovery occurred after Midsummer; but large supplies from the continent, where the crops have been abundant, have caused prices to recede 8s. to 10s. during the last two months, and they now stand at 40s. to 42s. per qr. (63lb.) for new English, against 49s. to 50s. last year at this time. Stocks are at present 9,000 qrs., against 8,500 qrs. in 1855.

PEAS have followed Beans in the movements of the market throughout the year. The supplies amount to 4,736 qrs., against 9,018 qrs. in the preceding year, thus showing a considerable falling off in the imports of this article. Owing to a comparatively high range of prices, the trade has been entirely on the hand-to-mouth system, and so remains; the value, however, is now about 12s. less than last year, being at present 40s. to 41s. per qr. (63lb.) for white boilers, and 36s. to 38s.

for grinding. The stocks are 3,900 qrs., against 2,600 qrs. at the close of 1855.

**CLOVER AND OTHER SEEDS.**—At the close of the Cloverseed season last spring, the stock of both white and red seed left over in this country, as well as on the continent, was unprecedentedly small, and before the result of the new crop was ascertained, what little old seed of good quality could be found was eagerly bought up at gradually advancing prices. The early accounts of the new white seed crop in Germany were very favourable both as to quality and yield, and offers for forward delivery were made at very moderate prices compared with last season. It soon, however, became apparent enough that these coloured reports emanated from certain interested speculators in Hamburg, who, having made large sales on contract for forward delivery, were anxious, irrespective of facts, to depress the market in order to supply their contracts at as large a profit as possible. In spite of these attempts, supplies came forward very sparingly, and prices continued to advance; thus, seed sold in August, for delivery in October and November at 60s. to 63s. per cwt. was at the time of delivery worth 68s. to 70s. free on board at Hamburg. The white seed now coming in from Germany is of good fair quality, though not equal to what we have had in former years; and those dealers in this country who are waiting to buy fine even quality, will in all probability be disappointed. The crop in Germany is represented to be nearly an average one, but there being, as before stated, no overheld stocks, it becomes questionable whether this year's produce will be sufficient for the requirements of the ensuing season, and therefore higher prices may be anticipated. The crop of red seed in France is small in quantity and inferior in quality in comparison with former years. There are likewise very trifling quantities saved in Belgium and Holland, and that mostly of weathered and inferior quality; while in this country, the continued wet weather happening just at the critical time when the seed was out and in the fields, the crop, which at one time promised to be abundant, was almost entirely destroyed, and the trifling quantity saved will be of very inferior quality. The crop in Germany is represented to be about an average, and although the quality will not be equal to what has been produced in some former years, still there will be a fair quantity of good useful growing seed.

The crop of Trefoil is reported to be fine in quality in this country, but the acreage and yield are much smaller than usual, while the result of the French crop is tolerably good, both as regards quality and quantity. This has been largely purchased by the trade, and the stocks in France are now materially reduced.

Italian Rye Grass is certainly a better crop this year than last, but in consequence of the increasing demand for this article, importers have been eager to secure the stocks abroad at an early period; so that recent reports speak of the supplies of this seed as being nearly cleared out. Rib Grass is scarce beyond all former precedent. We may consequently hazard the opinion that prices will be higher when the consumptive demand commences.

**LINSEED.**—The transactions in this important article of local consumption have been of an unprecedented character, both as respects the extent of the import and of the fluctuations in value.

Our imports in 1853 were 455,600 qrs.; in 1854, 305,610 qrs.; in 1855, 233,800 qrs.; and in 1856, 501,021 qrs.—the greatest supply ever received, consisting of 409,940 qrs. from the Baltic and Archangel, 62,087 qrs. from the Black Sea and the Mediterranean, and 29,894 qrs. from the East Indies. If we add thereto the imports into Grimsby, 64,419 qrs., and into Gainsbro', 29,089 qrs., and the transshipments from London (chiefly of East Indian seed), about 15,000 qrs., we arrive at a grand total of 608,949 qrs., into the Humber ports in 1856, being more than one-half of the entire imports of the United Kingdom.

At the commencement of the year the stock of Linseed was small (about 30,000 qrs.), and prices extremely high, Black Sea being sold at 78s. per qr., fine Petersburg 74s. to 76s., and Riga and Lower Port ordinary 63s. to 65s., and the great majority of the mill power idle. The war with Russia appeared likely to continue, and our prospects for supplies were correspondingly small. Rumours of the probability of peace negotiations, however, soon became current, and the imports being on a liberal scale, a decided and uninterrupted decline in prices

ensued, until about the middle of February, when seed had given way 10s. to 15s. per qr., according to quality. The demand for cake tending to increase the consumption, values were maintained with little variation till the commencement of April, when it was computed the entire stock of seed in the port was under 10,000 qrs.! The successful termination of the peace negotiations, together with more liberal supplies, rendered holders anxious to realize, and the markets continued to decline under forced sales until prices reached their lowest, about the end of May, when Black Sea seed was quoted 51s. per qr.; Petersburg fine, 48s.; ordinary Riga and Lower Port, 36s. to 38s. (weight 51lbs.) For several weeks prices remained stationary, but a large export demand for oil springing up, the consumption of seed was greatly stimulated, and a steady and uninterrupted improvement in prices ensued to nearly the present moment, when Black Sea seed is worth 61s. to 62s.; fine Petersburg, 58s. to 60s.; ordinary Riga and Lower Port, 50s. to 54s. The position of the crushing trade during the past month has been unsatisfactory. Notwithstanding the considerable reduction in the value of oil, and the restricted demand for cake, holders of seed have made little or no concession in their demands, and a natural result is a diminished consumption, several mills being already closed, with every prospect that others will have to follow their example, unless the relative value of seed and its products assimilate more closely. The stocks in warehouse at the end of this year are about 60,000 qrs., and from 15,000 to 20,000 qrs. in the hands of crushers.

**LINSEED OIL.**—The fluctuations in the value of this article, as may be surmised from the preceding paragraph, have been severe. A very moderate inquiry for home consumption existed at the beginning of the year at about 43s. per cwt., and a trifling advance thereon demanded for delivery the first three months; but prices immediately gave way with much rapidity, and though some export demand showed itself prices had fallen 10s. per cwt. by the middle of February, when a slight reaction ensued, which proved of short duration, and values receded until the lowest point was reached, the second week in May, when Oil was obtainable for immediate delivery at 29s. per cwt. The crushers generally, entertaining the impression that Oil was susceptible of further decline, entered into large contracts (chiefly, as it proved, with export houses) for forward delivery at prices ranging from 27s. 6d. per cwt. upwards. To this circumstance, and the speculative operations induced thereby, may be attributed the very remarkable movement that took place in this article and in Seed. Stimulated by these low prices, the export of Oil assumed so unprecedented a character, that, in conjunction with a heavy "bear" account, the utmost exertion on the part of our crushers was barely sufficient to supply the demand and provide for the monthly deliveries in fulfilment of contracts. Prices rapidly advanced to 40s. to 40s. 6d. at the close of September, which value was maintained, with trifling fluctuations, to the close of November. During the present month, owing to the decline in the export—occasioned partly by the interruption to the navigation of the near ports, and curtailment of transactions usual at this season—prices have given way about £4 per ton, the nearest value this day being 36s. per cwt. The export from hence to the continent has been enormous, say 12,540 tons, against 5,623 tons in 1855 and 6,240 tons in 1854. Stocks of Oil here are light, probably not exceeding 500 tons; and as the production has fallen off materially, and the market for seed evinces so much firmness, it is not improbable prices will recover shortly. Indeed there are buyers for spring delivery at 37s. to 37s. 6d., while the value on the spot is but 36s. per cwt.

Of **LINSEED CAKES** the production has necessarily been greatly in excess of any former year: yet their value as a food for cattle is so generally acknowledged and appreciated by agriculturists, that there appears little limit to the consumption but that imposed by price and supply; and an active demand, with but little exception, prevailed during the year. As might be presumed, stocks were trifling at the commencement of the year: prices of Hull-made very high—£13 10s. to £13 15s. per ton: the demand accordingly extremely limited, but still fully equal to the production. A decline, however, of fully £2 10s. per ton in February brought them more into consumption,

and prices improved in March to £11 5s. to £11 10s., but receded again at the end of April to £8 15s. to £9; improved in May, closing somewhat flatter at the end of the month, when a few contracts for forward delivery were made at £8 8s. and upwards. The demand continuing very good, prices improved in June and July, when the value was £9 10s. to £10. In August, Oil being in great demand, the crushers were consuming large quantities of Seed; and production of Cake being correspondingly great, prices again receded, but in September were again £10 5s. to £10 10s.; and continued steady thereat until the beginning of November, when the demand slackened, and remained dull to the present time, when Hull-made are obtainable at £9 15s. Foreign Cakes have been in small supply, and command fair sales at prices proportionate, quality considered, with the home-made.

**RAPSEED.**—The imports this year is 1,600 lasts, against 1,420 last year. Very little of this appeared on our market, the great proportion going direct into the hands of our crushers and those of the West Riding.

**RAPE OIL.**—The import has been very trifling this year compared with last, the quantities being 230 casks against 1,190 last year, the article having been dearer on the continent than in this country. Prices, which stood at 58s. per cwt. for brown English in the beginning of the year, gradually receded to 51s., the present value. The business passing throughout the year has been of a merely retail character, and prices at times, from the absence of demand, were quite nominal.

**RAPE CAKES.**—The import has been small compared to last year, and prices generally lower, the demand having been interfered with to some extent by the moderate prices of linseed cake and other articles which have been largely used for feeding purposes.

**OLIVE OIL.**—The import this year has been 4,920 tons, against 4,363 tons last year; which, together, is more than the total importation of the five previous years. The stock at present is about 280 tons, against 775 tons same time last year. If the consumption goes on for the next year as it has done the past two years, it is doubtful whether supplies can be had to meet the increased consumption; and the probability is that prices will now continue high for some time to come. The stock consists of about 40 tons Gallipoli, 60 Zante, and 180 other sorts, chiefly Seville. £58 is asked for Seville, and £60 for Gallipoli; the corresponding prices last year being £53 and £55.

**FISH OILS.**—The northern whale and seal fisheries have for some years past had small attention from this port. The import was about 100 tuns seal and 340 whale, great part of the latter having been sold for arrival at £40 to £42 per tun, the price here having ruled from £46 to £48 per tun, all without casks, the market closing about £46 10s. per tun. The Diama having made two successful voyages, is now being fitted with a screw and high-pressure engines; the result of which is looked for with much interest.

**FLAX.**—The total imports of flax for the year amounts to 18,941 tons, against 14,909 tons in 1855, 12,271 tons in 1854, 15,895 tons in 1853, and 14,050 tons in 1852. Of the present year's import 9,030 tons are from the Baltic, against 7,465 tons in 1853, 4,931 tons in 1854, 7,632 tons in 1853, and 6,317 tons in 1852; the remaining quantities are divided as follows, viz., 4,223 tons from Holland, 5,164 from Belgium, 321 from France, and 193 from sundries. The expectation of peace in the early months of the year induced great caution on behalf of the spinners, who only took the article to meet their immediate wants, and thus succeeded in depressing the market from £2 to £4 per ton below the quotations at the close of 1855. After this reduction the trade revived, and much business was done in the months of March, April, and May, both in our own and in the Scotch markets, with little variation in prices; the first qualities realizing more than the usual relative value. The arrivals from Riga were generally delayed by adverse winds until July, and the spinners becoming bare of stock, prices assumed great firmness. Large supplies came forward in August, but the demand being good the values were fully maintained, fine qualities being still prominently in request. In September and

October the market remained steady, but the trade was of a more quiet character; and in some instances a slight reduction in price was submitted to. During the last two months, the spinning trade being in a lively condition, prices have advanced from 20s. to 30s. per ton, the market closing very firmly. The stocks on hand are moderate, and with the prospect of an extensive consumption, and the influence of the advance in cotton, holders look for rather higher values. We quote good WCM at £45 10s., which is about £5 per ton below the rates at the close of last year.

**HEMP.**—The year's import of this article is about the same as in 1855. Prices have varied considerably during the year. Petersburg clean, which ruled at the commencement at £44 per ton, fell rapidly until May, when the lowest point was reached; clean being then worth £31, and Rhine £32 per ton. The Russian dealers at that period advanced their demands, causing a gradual reaction to take place in the English markets, and we quote the price now, at the close of the year, £36 to £36 10s. for clean, without, however, much animation in the trade; the increasing use among our cordage manufacturers of other fibres doubtless having a considerable influence. We estimate the present stock in Hull at nearly 2,000 tons.

**TALLOW.**—The import has considerably exceeded the last year; the largest proportion of which has gone into the interior, being for London account, the demand here being limited generally to a retail consumption. Our prices altogether depend upon the London market, at which importers are free sellers, there being a slight advantage over the metropolitan market in freight and insurance. The stock at the end of the present year consists of 550 casks, against 508 last year.

**IRON.**—Our imports this year have been to a much larger extent than last, say 32,390 tons, against 22,334 in 1855; the extra supply being composed of shipments of Russian iron, accumulated at Petersburg during the war. A considerable portion of the supplies have passed into consumption, but the tightness of the money market has not been without its usual restrictive influence upon the manufacturing trade, and the year closes with considerable stocks in merchants' hands. It is, however, not improbable that the home consumption, owing to the extension of railways in our colonies and on the continent, may create an increased demand.

**HIDES.**—The imports during the year have been about equal to last year, with the addition of about 20,000 Petersburg kips. Prices generally have been advancing, on some goods as much as 30 per cent. The market is very bare of stock.

**BONES.**—The imports show an excess of 4,042 tons, being 16,200 tons, against 12,158 tons in 1855. The stock is about 3,000 tons, against 1,000 tons same time last year. The consumption has been on the increase, and may be still more so next year, owing to the high price of guano.

**TAR.**—The imports of tar are 22,531 brls., against 18,511 last year, and 11,069 in 1854. In the early part of the season prices ruled high, and consumers confined their use of this article within the smallest possible compass. Towards the spring, when the prospect of an early termination of the war with Russia became apparent, a considerable fall in the value of this, as of other Russian produce, took place, and on the conclusion of peace, owing to an expectation of large imports of tar, buyers kept aloof, in the idea of coming in, later on, at low prices. The first direct imports were sold at about 16s., but upon subsequent arrivals the price receded to 14s., and below that figure. Towards the autumn, when it became apparent that the import would not reach the extent that had been expected, the price rallied, and gradually rose to 16s. 6d. and 17s., but towards the end of the season the demand almost entirely fell off, and a portion of the last arrivals has in consequence had to be stored, leaving over a stock in first hands of about 2,500 to 3,000 barrels, though the quantity held by the trade is comparatively small.

**TURPENTINE** has been steady in value throughout the year; but on reports reaching of the exhaustion of stocks in the United States, prices rose from 33s. last September to 46s. to 48s. per cwt., at which the year closes.

**WOOD.**—During the last year the imports have



been considerable from the Baltic ports, with a commensurate demand from the country dealers. The importation of American produce has been more limited than on any previous year in our recollection, 1855 excepted, and the stocks are consequently only small. Except a few cargoes of Petersburg deals there are no goods in first hands. Taking into consideration that at Grimsby and the other ports on the Humber the stocks are comparatively nominal, those held here are not greater than an average demand will clear off before fresh importations.

**COAL.**—The export of this article is very nearly double that of the year previous, the tonnage being 113,789, against 61,197 last year, and 55,507 in 1854. This constantly recurring increase in the demand proves that the quality of our shipments is satisfactory, and that the traffic arrangements on our railways afford opportunity of bringing them here at a much less cost than formerly.

**SALT.**—There has been a slight decrease in the export of salt during the present year, arising partly from the large quantity forwarded to Prussian ports for Russian use last year. Prices remained pretty steady throughout the year, ranging from 16s. to 20s. per ton.

**SHIPPING.**—The year opened favourably for the shipowner—to Quebec freights began at 42s. 6d. per standard hundred of deals, but this rate was not long maintained, and speedily receded to 36s. and 39s., and in some instances even 30s. was accepted about the middle of the season.

Towards the close of the year, freights recovered to 40s. on this side, and even higher rates were paid at the other side for seeking ships. Low-port freights opened at 100s. for deals, gave way slightly, and then recovered to about the same rate. Baltic freights were in the spring, viz., 17s. Danzig and Memel for timber; 70s. Riga, deals; and 5s. Wheat, Cronstadt; 55s. Wyburg, 60s. Fredricksham, and 20s. Windau, timber. Cronstadt, Wyburg, and Fredricksham rates gradually advanced to 60s. to 85s., and considerable excitement prevailed in these particular trades, but the others named remained pretty much the same, except Memel, which also advanced to 20s. for timber. Our opening rates from Archangel were 105s. deals; 5s. 6d. seed; but during the season business was done as low as 80s. for the former. Gothenburg freights have ruled from 30s. to 35s. for deals. On the whole, freights have been pretty high, and employment abundant; the casualties to shipping, however, have been lamentably frequent towards the close of the season.

In conclusion, it is cheering to remark the unprecedented activity and prosperity which have pervaded the commercial, agricultural, and shipping interests of the country; such having taken place during a long period of high discounts for money, exhibits a proof that this unexampled success has been founded on a safe and satisfactory basis.

P. BRUCE,

Secretary to the Hull Chamber of Commerce.

## ANNUAL REPORT OF THE LIVERPOOL WOOL TRADE.

**GENERAL REMARKS.**—The wool business during the past twelve months has been conducted on a sound footing, and for a great part of that time has presented a cheerful aspect. In the first few months there was considerable activity, owing to the reduced stocks of all descriptions, and particularly of fine colonial and similar qualities, which realized very extreme prices; a further stimulus was given to the trade by the alteration in the French tariff at this period, but the advantage to the French consumers being for the most part of a differential character and favouring direct imports, the influence was chiefly felt in fine scoured wools, which up to the earlier part of the London May public sales met with eager competition from that quarter; after these sales had been a fortnight in progress a sudden and somewhat unforeseen change took place, and during the remainder of that series until they closed on the 4th June there was extreme heaviness and a decline upon the opening prices established of nearly 1½d. per lb. For more than a month subsequently much inactivity prevailed, and so great was the gloom hanging over the Yorkshire markets, still further increased by the exaggerated estimate of the quantity to be offered at the next succeeding public sales, that many parties were induced to clear off their stocks at ruinous prices. The next public sales, which had for some time been looked forward to with anxiety and interest, began on the 17th July, and realized prices equivalent to the concluding rates of the previous series, the trade in the meantime presenting no feature of animation. At this period the bulk of the home wools came to market, but under the circumstances they engaged less than the usual attention, being attended generally with much activity, as it is a rule for growers to give the preference to former purchasers, who from the fact of their knowing the precise yield of the wools from practical experience, would be the more anxious to secure the same clips again; after this demand was satisfied, the trade generally feeling a want of confidence in the opening rates, a period of dulness ensued for some weeks, and prices receded from 1d. to 1½d. per lb., until the hot and genial harvest weather set in in August, which held out a prospect of abundant crops. This having been happily realized both in this country as well as abroad, all branches of trade have felt the beneficial effects, and perhaps none more decisively than the wool business. Owing to its sound position, political and monetary arrangements have been regarded as of minor importance in their bearings on trade; and when the first news of Peace was declared in April, at the time when our public sales were going forward, it had as little

influence upon prices as during the subsequent months of the year the advanced and stringent rates of the value of money, the trade being altogether regulated by the prospect of supply and demand. Since August there has been a uniform tendency to advancing prices, which, as regards combing wools of home-growth, have received a rapid, and to some parties in the trade somewhat unexpected development in the past six weeks; and for all such descriptions, and similar kinds which were in any way affected by their rise, the present range of prices is higher than we have seen them since 1834! We are by no means prepared to say that this advance is not altogether warranted, for it is an undeniable fact that stocks are reduced to such a point as to cause grounds for serious uneasiness to the trade; and it is very important to bear in mind, that while consumption has been steadily, and even rapidly increasing for some years—amply attested by the number of new mills that have been started—there has been no corresponding addition to the growth, which has been little, if at all augmented. These remarks apply with even greater force to some parts of the Continent, where the power of consumption has been in a much greater ratio; and, as we have frequently before taken occasion to notice, they are becoming our formidable competitors in the markets of the world, even in those departments of trade where formerly British goods stood unrivalled, and it will require all our energy to turn the advantages we possess to the best account, and by putting aside old prejudices even to retain our present position, with the additional prospect of the tariff both in France as well as in America approximating towards sounder principles of free-trade.

**HOME DEMAND FOR WOOLLEN GOODS.**—Notwithstanding the high prices of provisions during the greater part of the year, and the unsettled state of the money market, with the anomalous accompaniments of sound and healthy trade at periods of almost money-panics, business has proceeded uninterruptedly. The home population has on the whole been well and profitably occupied, and, as usual under the circumstances, been very large consumers.

**EXPORT OF WOOLLEN GOODS.**—The tables of exports to foreign and colonial markets continue to show a large, and during the latter months a very considerable increase as compared even with the most favourable returns of any former years, accompanied, we believe, with more satisfactory results to shippers; and, as we do not hear generally of the markets abroad being glutted, there is no reason to look for any diminished outlet for our goods, while the high prices prevailing in

this country for nearly all kinds of produce must have a very favourable influence on the markets abroad.

**CONSUMERS.**—Their condition during the greater part of the year has not been unattended with difficulty, prices of wool having generally been in advance of yarns and the manufactured article; and under the present circumstances, with the certainty of supplies being altogether inadequate to meet the present or even probable rate of consumption, their position will become still more trying. If this state of things were induced by speculation in the raw material, there would be a prospect of matters soon settling down to their proper level, but for several years past we have expressed a strong opinion that consumption was overtaking the production, and that sooner or later it would result in extreme prices. In looking forward, we think there is a permanent prospect of a higher range of prices than we have been accustomed to for some years past; and so far from regarding this as any disadvantage to the trade, although no doubt it will temporarily cause much inconvenience, we think in the end it will be productive of much good by stimulating the growth all over the world. Already several of our leading firms have made arrangements for running short time, but without being able to carry it out; we shall not, however, be surprised to see this more generally attempted some months later, or otherwise prices of wool must inevitably continue to advance. In our last annual report we alluded to the prospect of an early alteration in the French tariff on wools, which took place in February. As an abrogation of the former protective system it could not fail to be considered as a great measure in advance, but not being found to work well from being too restricted in its operation, we believe there is likely to be soon a further alteration, based upon sounder principles of policy.

**WOOL TRADE.**—As regards home descriptions, growers have derived the chief advantage from the rise in prices throughout the year, the former experience of consumers and dealers having been unfavourable to holding large stocks; and on this account many are taken quite by surprise at the euideness of the advance during the last six weeks in combing wools; and being attended at the same time with larger orders for goods which must be supplied, it seems hopeless to contend against it—at least for the present there is no prospect of abatement; and to those who through over-caution are ill supplied with stocks, sooner or later it must cause serious embarrassments. Colonial wools have, on the average, left fair profits to the importers, but in the general range of low wools there has been little if any margin, owing to the demand which has existed in other quarters, consequently our market has been kept bare of stocks throughout the year, which is more to be regretted as at the present time, with the prospect of an inadequate home-supply, they would prove a very valuable auxiliary. Under ordinary circumstances we are more particular in our classification and estimate of wools than is the case in any other country, and we may here admit that with some of our manufacturers it is carried to an extent bordering on prejudice. This is in some measure to be explained by the actual state of our domestic growth so peculiarly suited to our requirements, but for some years past foreign has been gaining favour, and many descriptions are now even much esteemed and sought after. The present altered state of affairs will tend very much to force these more generally into consumption, and holds out a prospect of importing to advantage even the most defective descriptions, the value of all sorts of wool, both present and prospective, in this market being higher than in any other.

**WOOL IMPORTS.**—The total receipts show a considerable increase, chiefly from the Cape of Good Hope, East India, South America, and Russia, but not to an extent commensurate to our wants, as we stated in our last annual report that our supplies were less at that time than at the same period in the previous year by 21 per cent. This alone is sufficient to account for the bare state of this market during this year, independent of the increased demand that has existed for the great part of that time. We refer with satisfaction to the large increase at this port, more particularly from Australia, and have confidence in predicting that it will continue to increase.

**WOOL EXPORTS.**—Here we have to notice a considerable falling off, chiefly in foreign, which under the circumstances is not at all surprising. We by no means regard this as an un-

favourable feature, as there is abundant evidence that it has been exported under more profitable circumstances as manufactured goods, or in the partially manufactured state of wool tops, which have greatly increased of late.

**AUSTRALIA.**—This port seems now in a fair way of becoming one of importance, at least for the "import" of wools from the Australian colonies, and although a large quantity continues still to be sent forward for sale in London, we regard this as only temporary; for when once the receivers became disposed to make a fair trial of this market, no further persuasion will be required for the future, and the best recommendation we can offer is to refer to our friends who have already made the experiment. During the months from November till April we can sell any quantity, large or small, to the fullest advantage either at auction or by private sale, but at other periods we have always maintained that it would be at least impolitic to attempt public sales here unless we could command a quantity of "sufficient magnitude," while at such times we consider private sales quite out of the question, except under peculiar circumstances such as a decided prospect of drooping prices. We have given ample proof of this in our frequent recommendations to send forward wools to London rather than in any way endanger their sale here. We have never doubted for a moment that eventually we should have a large portion of the trade, and acting upon this opinion we have always considered it the true maxim never to undertake any business without the prospect of doing it well, leaving the rest to the course of events, under the full persuasion that shippers are the best judges of the result. The condition of the clip has been generally favourable this season. The first series of public sales in London commenced on 14th February and closed on 7th March, comprising 48,900 bales, of which 25,427 bales were Australian and 17,622 bales Cape! The prospects of a speedy termination of the war, combined with a reduction in the prices of food and an improved demand for manufactures, gave an impetus to prices, and an advance of from 2d. to 4d. per lb. was established. The quantity taken for the continent was estimated at about 12,000 bales, chiefly for France, where a considerable reduction in the tariff had been followed by a greatly increased demand. The chief feature of this series, however, was the large quantity of Cape (almost a twelve-months' supply a few years back), and which sold at an average advance of 3d. per lb., on the October-November sales, and the breed and washing having greatly improved, the growers will no doubt have been amply recompensed for their outlay. The second series lasted from the 8th May to the 4th June, and the total quantity offered was 56,200 bales, including 7,950 bales Cape. They opened with an advance of 1d. to 1½d. owing to the eager competition and large attendance of buyers; but their wants being supplied, prices receded to about the same range as at the close of the previous sales. The third series was the largest on record, comprising 86,600 bales, including 6,850 bales Cape, and lasting from the 17th July to 25th August. The quantity being so enormous, it was taken for granted that a decline was inevitable—however, this was only partly realized, for, although prices receded at the commencement 1d. to 1½d., they soon rallied again, and the result was that they closed at fully May sales rates. The fourth and last series took place from the 6th to 29th November, and the total quantity brought forward was 62,000 bales, including 18,200 bales Cape. An unusually long period having elapsed since the previous sales, and with the prospect that the next series in February will be a very small one, the trade was prepared for an advance, notwithstanding the high rates of discount, and the sales commenced at fully 1d., and increased to 1½d. to 2d. advance on the August series. Again a large quantity, say 12,000 bales, was taken for foreign account. There has been a decided falling off in the receipts from the Port Phillip districts, while from South Australia there has been a considerable increase, but it must not be looked upon as the increased yield of the last clip, as it is known that a large quantity was left over from the former year, owing to the difficulty of transport from the shallowness of water in the Murray. The navigation of this important river has been materially extended through the employment of vessels of very light draught, which has thus been rendered navigable to some portion of the neighbouring colony of Victoria, and it may be safely assumed that at least a couple of thousand bales from that quarter has this year been shipped through Adelaide. New Zealand has come forward in greatly improved condition, and promises soon to

take a prominent place in the estimation of the trade, from its healthy, sound, and useful properties.

**CAPE OF GOOD HOPE.**—As a source of supply of wools we consider the prospects of this colony in the highest degree encouraging, and particularly so at the present time, when the growth in Australia seems to have received a decided check. Many parties are inclined to look upon this as only temporary, but independent of the attraction of the mineral wealth of those colonies, there is no doubt that the growing of wool has ceased to be remunerative, at least that other occupations have been found more profitable, and it is known that some flocks of repute have disappeared altogether, the settlers having turned their attention to the rearing of cattle. It seems indeed doubtful whether the pasture lands of Australia are capable of much extension, being chiefly confined to the seaboard, whilst at the Cape the area seems almost without limit, and the great increase of late years likely to continue, the more so as greater attention is now being paid to sending the wool home in better order, which is so essential to insure a current sale, and to this may be chiefly attributed the growing favour which Cape wools have engaged for some time past.

**GERMAN.**—This article is more and more getting out of use, and owing to the limited consumption is now chiefly imported for the immediate wants of the trade, consequently there is at times difficulty in meeting with any particular qualities that may be required.

**SPANISH AND PORTUGAL.**—There has at times been an enquiry for the better qualities of both descriptions, and at present they would meet with very current sale at remunerative prices, but we are quite without any stocks. *Lony Oporto* has during the year met with free sale, generally on arrival, and is at present in very brisk demand.

**UNITED STATES.**—The state of trade in this country is of growing and almost of unrivalled prosperity, and with its rapidly increasing population and overflowing treasury it seems in a position to carry out with ease any fiscal changes that may be demanded by the times. Their tariff, while framed with the object of protection, has presented the anomaly of admitting manufactured goods on more favourable terms than wools; on both the duties are so extremely onerous that for some time they have called forth very strong expressions of public opinion. The subject has been engaging serious attention, and may be expected to result in a wiser system of policy. If carried out it will prove an immense boon to their manufacturers, who for many of the descriptions they require are altogether dependent on foreign supplies. The manufacture of wools does not seem to be attended with profit to those directly connected with it; this may to a great extent be traced to their present restricted policy in regard to raw materials, and it is fresh in our recollection how the trade in our own country expanded with every successive reduction of the duty, until at length the principle was consummated in free trade, admitting the raw material entirely free, since which period the trade has increased to a degree altogether out of proportion to any previous experience. Many of the woolen mills in the United States are of vast extent, admirably arranged, and conducted with very great order and system, but a visitor would be more particularly attracted by the neat and cleanly appearance of the operatives, so much superior to what is usually seen in our own manufacturing districts, and it is in the highest degree creditable to the American manufacturers to observe the care they bestow on the morals and comfort of those in their employ, who are enabled to lay by a considerable portion of their earnings, and after some years are placed in easy circumstances; and while such consideration is shown for a large and intelligent portion of the labouring population, the parties who are most deeply interested seem to have at any rate a fair claim to the solicitude of their government for a system which through them reflects credit on the country.

**BUENOS AYRES AND RIVER PLATE.**—While the shipments show a considerable increase, the principal part having gone direct to Belgium and France, our receipts have been much less than for some years previous, which is greatly to be regretted, as these wools are now becoming appreciated in this country to an extent fully to bear out all the favourable anticipations we have so frequently expressed, and the most satisfactory evidence of this has been the very ready sale that has attended all current qualities immediately on arrival, to the

great satisfaction of importers, as high as 2s. 1d., and even 2s. 2d. per lb. having been paid—rates which had never before been heard of; and it is a very important feature to notice that they have been chiefly taken by the home trade, who have also been large purchasers in France and Belgium of this description—a proof that this country offered the best market. It is rather an interesting fact to record that some Entre Rios wool sold by us last spring was manufactured into cloth by the same party who had purchased a prize bale of Cape at 3s. 6d. per lb, and one of Sydney at 3s. 9d. per lb.; and it was the opinion of competent judges that that produced from the Entre Rios was superior to either of the others. The vast pastures of the River Plate afford almost boundless scope for the cultivation of wool, and to this quarter and the Cape of Good Hope we must chiefly trust for any material increase in our supplies, which the present and probable high range of prices for some time to come will materially tend to develop. It is no slight advantage that the great bulk of River Plate wools can reach this country at a period of the year when our markets are bare of stock; and they have thus the prospect both of a ready sale and at more stable prices, which later in the season are liable to be affected by a temporary glut of fine colonial wools. Great as was the increase last year, it is likely to be much larger during the present one, as many are turning their attention to sheep in preference to cattle, and this is partly the cause of the extreme prices for hides at present. There has been only a moderate supply from Cordova. This article has throughout the year been in good demand; at present there is a very limited stock, and none in first hands. Scarcely any common Buenos Ayres has reached this country; there has been a good inquiry, and it would command full prices.

**PERUVIAN AND ALPACA.**—There has been an increased supply of Alpaca, which would have been still further augmented but for the loss of the Mary Hartley with 1,700 ballots, and the Chiuaborazo with 800 ballots. It has met with very free sale for arrival throughout the whole of the year; during January alone the sales amounted to 10,000 ballots, at from 2s. 6d. to 2s. 6½d. per lb. The prices have since been generally on the advance, with some slight fluctuations. During the latter months some large contracts for arrivals have been made, the last prices paid being 2s. 9d. to 2s. 9½d. per lb. Almost the whole has been retained for home consumption, although there has been an occasional demand for particular colours for export. Peruvian shows a considerable increase; the finer qualities have met with ready sale at full prices, as have also Lima wools, both of which are at present in good demand; but the great bulk being of inferior kinds have engaged little attention, as they were held above their market-value until September, when a considerable quantity was purchased on speculation, and there is very little now left in first hands.

**EAST INDIA.**—We are glad to notice a considerably increased import: the trade look for at least a steady augmentation of supply from this quarter; and if it had been otherwise—not to say had the receipts shown any decline—it would have been severely felt. It requires no argument to prove the advantages of this market, as the facts speak for themselves, and shippers are equally alive to them. The total receipts have been 47,076 bales; of which 34,351 bales have reached this port, against 17,999 in 1853! It is much to be regretted that the blanket trade, for which these wools are extensively used, has during the year continued very depressed, and that consequently prices have not participated in the improvement of many other descriptions; but there is reason to hope that this important branch will soon revive to a corresponding extent with the carpet trade; and as these wools are now applicable for general purposes, we have every reason to expect that prices will be at least well maintained. There is still much to be desired in the mode of getting up these wools, and it would be very advantageous to shippers if they were classed with more care.

**CHINA.**—We have only had a very limited import, and that chiefly to London. Why it should continue to be sent there, we are quite at a loss to understand. As we have before observed, there are properties in these wools which, with judicious management, would make them valuable to the trade, and render them worth attention.

**RUSSIA.**—The opening of the trade has confirmed the opi-

nion that stocks of wool had been completely cleared out in consequence of a greatly increased internal demand during the war, and the rest had chiefly been sent to Austria and Prussia. Our receipts since have not been to any considerable extent, and the greater part has been of common kinds. It is only within the last two months that Donskoi fleece has been in much demand; the stocks are reduced to a mere trifle, composed of short and inferior parcels held at extreme rates. Of autumn there is also scarcely anything left. Both these kinds, as well as lambs', are in demand, and would command full prices. There is a very scanty supply of the finer descriptions, both of brook-washed and scoured wools, which are of ready sale, with the prospect of realizing higher prices in consequence of the inadequate stocks of fine colonial and other similar kinds.

MEDITERRANEAN wools generally engaged little attention during the early months of the year, but for some time past have been much sought after, particularly all kinds of long-stapled, such as Bosnia, Servia, Vidino, &c., of which scarcely any stock remains, and they would meet with very ready sale at high prices. Smyrna wools, although of less current sale, would find buyers at fair prices, and good qualities at full value, as would also Syria of good quality and long-staple, either washed or in the grease.

EGYPTIAN wools of good or even fair character have always found ready buyers, and are at present in eager demand; but shorter parcels meet less ready sales, and prices are not equal in proportion. The prevalence of a large admixture of Syria and other inferior kinds in Egyptian wools continue to exist to a considerable extent, and has frequently been found a great hindrance to the sale without submitting to a corresponding reduction in value.

TURKEY GOATS' WOOL OR MOHAIR.—Prices have shown a remarkable degree of uniformity; but notwithstanding they have ruled so high, the import has fallen considerably short of the former year. A very brisk business has been done of late, and the sales have included a considerable quantity to arrive.

ICELAND.—This article has engaged more than the usual attention; and having been prominently brought under the notice of the trade, has been applied to purposes for which it has not hitherto been used, and which is likely to secure for it the same steady demand which it has met with during the past year, when everything was sold at once on arrival or immediately afterwards, and in most cases at the full relative value of the day in comparison with other kinds.

MOGADORE AND BARBARY.—The total receipts have been to nearly an average extent, but have not embraced many of the inferior descriptions of Barbary which had before been attended with such unfavourable results. Fair, and in particular, good parcels have found very ready sale at full rates, and are at present very much sought after.

DOMESTIC WOOLS.—The course of prices of ENGLISH wools, and particularly combing kinds, present a great contrast to the previous year, which was characterized by great uniformity, whereas on the present occasion it has been quite the reverse. The demand has chiefly turned upon the bright-haired descriptions, such as Lincoln and Leicester, the supply of which is now becoming greatly impaired; and it is owing to this cause that they have been forced up to prices quite out of proportion to any other kinds, and have drawn other sorts with them. The prevailing high prices have induced parties to some extent to use up their Brokes and to curtail the production of Noils to the least possible amount, while at the same time they have been led to seek for anything in foreign as a substitute. It is supposed by those most capable of forming a correct opinion, that our last home-clip was below an average. In the absence of statistics there is no means of ascertaining this, which, however, if the case, will show itself before the next clip; and, should it unfortunately be realized, will prove a most grievous evil at the present time. While admitting that the present scale of prices is warranted under the circumstances, it is important not to lose sight of the fact that they are far higher than they have been for a very considerable period, and should the advance continue, unforeseen casualties may occur to render the trade extremely dangerous. IRISH has been in good demand, and exporters have taken their usual quantity; at present prices are rather lower than other descriptions, and very little wool seems left in the country, which is held with great tenacity. SCOTCH of all kinds

is reduced to a lower point in this market than we have ever before known, while the quantity remaining in Scotland is insufficient for their own requirements. There is a brisk demand for all descriptions at the full quoted rates of the day.

SHEEP SKINS have been in good demand, and all current descriptions readily saleable at constantly advancing rates. At the present time, owing to the excited state of the wool market, they are much sought after, and can be readily disposed of at rates proportionate to the value of wool.

Our next public sales will commence on the 15th instant. There will be 11,000 bales East India; and, although the quantity is unusually large, we have every reason to expect they will engage considerable attention from the long interval since the last public sales and the trade being low in stocks. There will also be several thousand bales of foreign offered, of which a portion will be Peruvian, and a few hundred bags Egyptian, Liverpool, Jan. 1.

HUGHES & RONALD,  
Wool Brokers.

TITHES COMMUTATION.—1857.

SIR,—As many of your readers may feel anxious to know the result of the Corn Averages for the seven years to Christmas last, published by authority in the London Gazette of this evening, viz:—

Wheat . . . . .	6s. 11½d.	per imperial bushel.
Barley . . . . .	3 11½	ditto.
Oats . . . . .	2 9½	ditto.

I beg to state, for their information, that each £100 of tithes rent-charge will, for the year 1857, amount to £99 13s. 7½d., which is a little more than 5½ per cent. above the last year's value.

The following statement from my "Annual Tithes Commutation Tables" will show the worth of £100 of tithes rent-charge for each year since the passing of the Tithes Commutation Act, viz:—

For the year 1837 . . . . .	£98 13 9¾
" 1838 . . . . .	97 7 11
" 1839 . . . . .	95 7 9
" 1840 . . . . .	98 15 9½
" 1841 . . . . .	102 12 5½
" 1842 . . . . .	105 8 2¾
" 1843 . . . . .	105 12 2¾
" 1844 . . . . .	104 3 5½
" 1845 . . . . .	103 17 11½
" 1846 . . . . .	102 17 8¾
" 1847 . . . . .	99 18 10¼
" 1848 . . . . .	102 1 0
" 1849 . . . . .	100 3 7¾
" 1850 . . . . .	98 16 10
" 1851 . . . . .	96 11 4¾
" 1852 . . . . .	93 16 11½
" 1853 . . . . .	91 13 5¾
" 1854 . . . . .	90 19 5
" 1855 . . . . .	89 15 8¾
" 1856 . . . . .	93 18 1½
" 1857 . . . . .	99 13 7¼
	2) 2,072 6 2¾

General average for 21 years, £98 13 7½

I am, Sir, your most obedient Servant,  
CHARLES M. WILLICH,  
Actuary University Life Assurance Society.  
25, Suffolk-street, Pall Mall East,  
9th January, 1857.

THE AVERAGE PRICE OF CORN, per Quarter (Imperial Measure), in England and Wales, for the QUARTER ending Christmas, 1856.

Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
63s. 4d.	44s. 7d.	25s. 6d.	40s. 9d.	45s. 2d.	43s. 1d.

HENRY FENTON JADIS,

Comptroller of Corn Returns.

Corn Department, Board of Trade,  
January 5, 1857.

RETURN, stating what has been, during seven years, ending on the Thursday next before Christmas Day 1856, the Average Price of an IMPERIAL BUSHEL of BRITISH WHEAT, BARLEY, and OATS, computed from the Weekly Averages of CORN RETURNS.

Published pursuant to an Act, passed in the 6th and 7th year of the Reign of King William the Fourth,

intituled "An Act for the Commutation of Tithes in England and Wales."

Wheat.	Barley.	Oats.
6s. 11 <sup>1</sup> / <sub>4</sub> d. ....	3s. 11 <sup>1</sup> / <sub>4</sub> d. ....	2s. 9 <sup>1</sup> / <sub>4</sub> d.

HENRY FENTON JADIS,  
Comptroller of Corn Returns.

Corn Department, Board of Trade,  
January 5, 1857.

## STEAM PLOUGHS AND STEAM PLOUGHING, AND THEIR ULTIMATE EFFECT.

Sir,—As there seems every probability of steam being made available for the purpose of ploughing, and perhaps at not a very distant date engines will be seen in our fields for turning up the soil as frequently as in our rick-yards for thrashing the grain, some consequences arising out of such system seem to force themselves to the view of every reflective mind. This subject, to a more ingenious and able pen, might afford matter for an article of considerable length; but I will thank you to find space for a few brief but practical considerations, from only a disinterested reader and subscriber, on a matter of such deep importance to the producing agricultural as well as the non-producing but consuming community.

There seem to be no bounds to the enthusiasm of the occupiers and owners of land; and many there are who have hailed the advent of steam-ploughing as the great desideratum to the farm. A great author observes—"Hitherto shalt thou come, but no farther." Now this maxim may not apply to the culture of the soil: at all events, I will speak of the progress of steam, as we now hear, and daily may see, it carried into effect. I have no hesitation in saying that there is no reason why it should not be the general system of ploughing, in three or four years, as much as the combined steam-thresher-shaker-and-winner is for thrashing and preparing at once the corn for market; which everybody must admit as a great fact, inasmuch as there is hardly a flail to be heard, and horse-power machines are fast going out of date—their castings may, ere long, become the fire-bars to some locomotive or stationary ploughing-engine.

There are few who write on farming subjects without some bias or local prejudice; and on a topic of this sort it is likely to be more so than ordinary, as the probability is the parties most deeply interested give the most attractive complexion to their new schemes. This is natural enough. But there is another characteristic feature of our modern model farmers (not the clodpole John Bull primitive clown); they, unlike all other professions, are so elated with any discovery they may make of a chemical or engineering character, that they go to some agricultural meeting and proclaim, *pro bono publico*, their astounding genius. What should we say of a tradesman who went forth in the same public manner, and tell up all his successes or his dexterous methods of doing business? Would a medical practitioner, who made some extraordinary discovery in anatomy or the application of medicine, pronounce to the world gratuitously what was likely to prove of immense personal advantage to himself? He would be "all serene"; and unlike the spouting farmer, would, without injury to the public, take advantage of his discovery, and bestow at £1 1s. per head his newly discovered antidote to the ailments of the human frame.

As I could not well treat of steam-engines for ploughing

without first saying a word to those most likely to have them in use, I must be excused if I have made too long a preface to these perhaps, after all, imperfect opinions. When railroads were becoming general, loud were the expressions of anger and fears of every character lest the breeding of that noble animal, the horse, should become extinct, and growth of oats, so necessary for his sustenance, discouraged. Old Time, however, has dissipated all these fears. Horses are dear, and oats are dear; but "the reason why" is, perhaps, more accurately given in an article on the Howden and other North horse fairs in the *Mark-lane Express*.

But how have the prices been, in the interval? Cheap—very cheap. Ten years ago a good useful cart-horse could be bought at £20 which now costs £40; so that it did have its effect, and with full force too. "What has been will be again," say the knowing ones; but they do not say when. Neither do I. But be assured, if steam ploughing should become general, that vicissitudes of a still more depressing character must certainly arise, though probably the crisis may sooner arrive than when stage-coaches were superseded by railroads and locomotive engines. Farmers! brother farmers! I strongly advise you not to be slumbering, in these momentous times.

Having animadverted on the effect of steam for ploughing as a draught power, I will now take a further view of my subject, as not only superseding horse labour; for should these engines and ploughs come, as I before observed, into general use, there are few who, without deep calculation, would be able to say how much horse labour would be suspended. Might I be allowed to say one million—one million horses less required for working the land? May it not in a few short years be three millions? "So much the better," do I hear some one say, of kindly feelings towards this portion of the brute creation? A member of the Society for the Prevention of Cruelty to Animals would say, "A wonderful intervention of Providence! poor jaded horses will not be seen going to and fro the fields, with sore shoulders, for at least three hours at a time too long;" *so far good and true*. But the evil, or if it be a good, does not end here. Now, from my experience (over twenty years) I find that every well-kept (punish the ill-keeper and ill-user) farm-horse consumes two bushels per week—and he cannot be kept in good working-condition with less: this will be 104 bushels yearly, or 13 qrs. of corn per horse. Any farmer using ten horses would therefore consume 130 qrs. of oats annually. The price will not be thought too liberal at 20s. per qr.; total consumption of corn for horses £130; two trusses of hay in winter, and an equivalent in vetches and clover in summer, will be necessary, at 2s. 6d. per truss; 5s. per week for ten horses, 50s. per week, will be £130 per annum for hay and other provender together, making for total keep of

the ten horses £260 for twelve months. Farms of 300 acres, and mostly arable land, would employ that number of horses.

Now, a farm-horse with this allowance of food usually produces manure enough for five acres of land, so that the ten horses would every year make manure for fifty acres of this farm. What substitute will modern philosophic men use as manure for this land when it is all ploughed by steam? Will some be bold enough to answer me? "Why purchase all? Let it be Peruvian guano with two-thirds of ground loam, blood manure, superphosphate, ashes, lime, &c." But a more intelligent individual answers me, "You can keep more sheep and bullocks, having no horses to provide for." This is all very well, and might be beneficial for one year; then the market becomes glutted, and, like in former years of my recollection, beef may be thrown undigested on the dunghill. Copenhagen Market returns shows over 6,000 on Monday, 29th Sept., 1856; and steam ploughs in their infancy! The same species of argument will apply to the production of mutton.

Let farmers throw off the mask, and not be frightened at their own shadows; at the same time, when embarking on any new system, look forward to consequences: they may be the reverse of what I predict, but a consequence must inevitably follow.

On a farm there is a deal of draught-work besides the ploughing and the general acts of husbandry, which, we will presume, can as easily be effected by steam as the ploughing. There is carting-out manure on hilly farms—rather a laborious work, and often requires as many horses as the whole ploughing teams. Often there is liming and chalking, and lastly the carting home the corn. A few farms may have their tram-roads for bringing the produce of the land to the steading. Others may have their liquid-manure tanks, and the contents like that of Mr. Mechi's, pumped out through hose to the fields. Farmers of England know, most of them, as well as I do, that there are few homesteads that have a small *perpetual stream* just bringing enough—never too much—water for this five, six, or seven-horse power engine to drive off through mains over the soil, after having washed out the bullock pens, piggeries, &c. It must not be supposed that I am one of those primitive individuals who view with a morose suspicion modern inventions of mechanical skill as applied to the preparation of crops or culture of the land. I am a firm believer in the progressive principles of agriculture; and so much so, that

if facilities from the "*proper quarter*" were granted, and the waste land brought into cultivation, we might snap our fingers at our continental neighbours, millions of quarters might be added to our stores, and millions of smoke-dried and often half-starved individuals might be employed on the land, to the benefit of both health and morals. In many cases, in many counties, we have acted a niggardly part by the land, its tenantry, its labourers; and the latter for the last half-century have flocked to our great towns, from the manufacturers being the best paymasters.

Landlords of England, both great and small, arouse from your lethargic indifference! With us the greatest barrier to improvement lies. Feudal obstruction is the great preventive to the progressive inclination of the age. Parochial building clubs could be easily established in every locality. Thousands, spent in waste in ale-houses, will be saved whenever some practical philanthropists come forward from among the landlord class. Properly domicile the poor, and give a fair portion of the waste; and they would soon make productive gardens of the whole of the waste of this kingdom, without the use of steam-ploughs. They are, I know, only anxiously looking forward to such a state of Elysium in many localities. Could a more useful or interesting picture appear to the eye of all who really have the welfare of our poor fellow-men at heart, than to see and know that 4,000,000 of our labouring people were turning up with spade, some fine week in April, 2,000,000 only of our waste acres, and making gardens of *their own*, with houses thereon, the former kindly granted by their manorial lord and patron, the latter the fruit of their own industry, aided by a parochial or local building club? "Where there's a will, there's a way;" and although a very simple maxim, it seems truly applicable.

Sincerely do I hope to see the time when we shall unite real liberality with true feelings of generosity, and concede to our lowlier fellow-man what perhaps may, with a bad grace, be wrested from us by an act framed within the walls of the Senate-house.

If steam-ploughs to cultivate the remaining 13,000,000 acres should be manufactured, then will the highest wishes of a landlord have been attained. D. H. H.

Apologising for any digression from my text,  
Believe me,

A POOR MAN'S FRIEND, AND A MODERN FARMER,  
A LANDLORD, AND A SUBSCRIBER.

## THE COUNTRY GENTLEMAN—PAST AND PRESENT.

When the *Spectator* essayed to portray a happy man, he sagely sought his original from those who lead a rural life. He pictured a country gentleman true to his position; fulfilling the many duties of his station, not so much as a mere matter of duty, but in the spontaneous goodness of his own heart. He appeared, as it were, the head of a large family circle, anxiously considering the claims of all around him, and ranking in reality rather as their friend than as their patron. The moral of such a life is evident enough, and Sir Roger dies the happy man he had lived. However close to nature, or improved by the master-hand who drew it, the character is one of the most successful ever

conceived. It is imbued, moreover, with an air of reality than few of us would care to doubt or question. Surely the good Country Squire, beloved and beloved his neighbours, is no such impossibility after all. He must have had an identity ere this, and he may have it still.

He has. Dropping with the pig-tail, long frock, and habitual tops, a few of the peculiarities and prejudices which distinguished the country gentleman in the days when Addison wrote, could we not even now match his innate goodness and sympathy for those with whom he is associated? Trying him by the perhaps more practical spirit of our own age, might we

not discover such a type worthy to compare with that the essayist has handed down to us? Some such a one, who, whatever his abilities or his ambition may have done for him elsewhere, turns to home after all for his character. Whose best reference shall be his own household, the tenantry on his estates, or the labourer in his parish—the good master, the good landlord, and the good friend, to all.

There are few of our readers but who will recognise in Mr. Newdegate, the Member for North Warwickshire, a zealous advocate of the Agricultural interest. With whatever success he may have laboured so far, there is no man in the House who has preserved a higher character for integrity, and not many who have displayed as much zeal, ability, and industry on the part of those they have been chosen to represent. However some might be inclined to differ with him as to the maintenance of certain principles, we feel sure that no man has more deservedly the confidence of what is termed the Country party, or of Agriculture generally. His standing in the country gave him a primary right to the position he fills, and his talents have confirmed it. Did we want to illustrate from the strength of the House what an English country gentleman of this present century is now equal to, we could name none more directly than the Honourable Member for North Warwickshire.

We would try him, however, a little further than this; and, admitting his claims as a public man, see how he has comported himself in the meanwhile as a private gentleman. It is not always that the one character assimilates with the other. What may be termed the higher calls on a man's energies have too often caused him to neglect or forget his home duties and enjoyments. It has not been so with Mr. Newdegate. We may cite him, as we do indeed here, as a model for his class, on the grateful showing of his own people. It is only within this week or two that the tenantry on the estate have presented his mother, Mrs. Newdegate, with a portrait of her son, accompanied by an address, the argument of which fully justifies the compliment they have paid to a good landlord and a good son. In the columns of a paper, one of the avowed principles of which is to maintain that "property has its duties as well as its rights," let such a testimony speak for itself:—

"We take this opportunity of expressing how highly we appreciate him as our landlord.

"During the long period we have occupied land on this estate, Mr. Newdegate has constantly held out the hand of friendship towards us, and in all times of difficulty has voluntarily taken a full share of the burden. In addition to which, by the liberal agreements he has given to his tenants, they are amply secured and encouraged to cultivate their farms advantageously.

"Mr. Newdegate's efforts to serve the agricultural and commercial interest generally are well known in the county, and his manly and upright conduct in the House of Commons has gained him universal respect.

"We are much indebted to you and Mr. Newdegate for the benefits you have conferred on this parish and

neighbourhood by extending the means of education to the working classes, and also for your unwearied attention to the wants and comforts of the poor around you."

This, be it observed, is no blind homage. As a landlord Mr. Newdegate has "borne his share of the burden;" "given his tenantry *liberal agreements and ample security*," and "encouraged them to cultivate their farms advantageously." We ask no better proof of a good landlord. As a County Member his conduct is well termed "manly and upright;" while mother and son give the finishing touches to a picture that will always rival Mr. Say's, however happy it may be, in "the benefits conferred on the parish and the neighbourhood, by extending the means of education," and "unwearied attention to the wants and comforts of the poor."

We can hardly go out of our way to honour a man like this. As a public one he has at least our respect, while as a private gentleman we might share with his tenants and neighbours a somewhat warmer feeling. Even they, perhaps, may not be aware of the many arduous duties he has been engaged on, and all with the same end—to have the position of this kingdom as a self-supporting country properly known and understood. Despite declining health, it is only within this last year or so that Mr. Newdegate has produced one of the most elaborate and perfect works of its kind ever yet offered us. What the Government was unequal to, Mr. Newdegate has alone effected; and his "CUSTOMS AND TARIFFS OF ALL NATIONS" will be the one standard authority, so long as there are customs and tariffs to be taken.

Let us complete the sketch. Mr. Newdegate is no mere "Sap," or passive Lord to his good mother's Lady Bountiful. As the Arbury address says, his conduct is everywhere "manly and upright." He fulfils not merely the duties, but shares the pleasures of a country life. He can sympathize not only with the cares of his neighbours, but enter as warmly into their pastimes. If Homer of old could immortalize his hero as "a horse-breaker," surely we may be pardoned in chronicling ours as "a horseman." It is a fine point at any time in an Englishman's character, and there never was a finer or a better yet over a country than the Squire of Arbury. Imitate him as we may in some of his attributes, it will take a very good man to follow him here.

In our obituary we have to record the death of Mr. Chamberlain, of Desford, who has for a lengthened period occupied a very prominent position in the agricultural world, and who has been for many years in high repute as a breeder of Hereford cattle and Leicester sheep; he was for some years a successful competitor at the Smithfield Club, and gained more prizes than almost any other man, on two occasions receiving a gold medal for his stock. Only as recently as the last show he appeared as an active member, being mainly instrumental in making considerable improvements in the prize sheet for next year. Mr. Chamberlain was also known as a first-rate judge of cattle, in which capacity he has many times officiated at the Royal Agricultural Society's meetings, as well as at the Birmingham, Yorkshire, and other shows. He was a staunch supporter of every improvement in agriculture, and we believe he was as universally respected as he is now deeply regretted. He has died in the midst of his usefulness and activity, full of all the honours a man in his position could obtain.

## OUR TRADE WITH THE CONTINENT THROUGH THE PORT OF HULL.

We have before us many excellent local summaries and epitomes of the trade of the past year, and we select for more prominent notice that of the port of Hull, from its great importance as indicative of the large import trade in agricultural products from the North of Europe, which has been rapidly increasing. The commercial progress of the port is shown by the fact that one million tons of shipping entered its docks in 1856, being an increase of twenty-five per cent. in four years.

The annual imports of grain and seeds of all kinds into Hull now exceeds one million quarters. About one-half of this is linseed, which is largely taken for home consumption, more being received at Hull than at all the other ports of the kingdom. The imports of this article are given at 501,078 qrs., of rapeseed 17,000 qrs., of linseed oil 12,700 tons, and of oilcakes 10,300 tons. The cereals and pulse were, wheat 205,203 qrs., barley 156,228 qrs., oats 38,500 qrs., beans 71,236 qrs., peas 5,052 qrs., tares 5,235 qrs.

These are the chief articles of import; but there are many other agricultural products of prominence, making up the aggregate of the increasing Channel-trade of Hull—16,439 tons of cattle-bones, 16,000 tons of flax, 5,801 casks of tallow, 8,918 tuns of olive-oil, 16,323 cwt. of turpentine, 22,047 barrels of flour, 42,403 cwt. of clover-seed, 9,228 bales and 8½ million pounds of wool.

One great help to the rapid increase in the trade of Hull has been the substitution of steamers for sailing vessels, as many as sixty steamers being now regularly employed in the trade of the port. The old-fashioned Petersburg traders, which used to esteem two voyages to Cronstadt a triumph, are now replaced by splendid steamers; the Rotterdam brigs have been changed into screws; the Hamburg trade is now exclusively one of steam; and it reaches many of the Baltic ports, and seems likely hereafter to embrace them all.

Since 1846 the imports of grain and seeds at the port of Hull have more than doubled. Glancing at the last three or four years, the wheat imports there are tolerably steady; barley, which had been declining, in 1855 being only to the amount of 27,089 quarters, has increased nearly six-fold; oats are rather larger in the imports; peas have been rapidly declining, the imports of last year being less by one-half than those of several preceding years; beans show a considerable increase—nearly one-half; the supply of linseed brought in is more than double that imported in 1855. Large as were the arrivals of grain, however, they were as nothing compared to the enormous quantity of wood received, amounting to 58,377 pieces of hewn timber, and 24,794 hundred of deals.

Hull, therefore, took a large share of the import trade of last year; and it is gratifying to find that the local authorities are facilitating the trade and commerce

by numerous improvements. A new corn exchange has been erected by the town council at a cost of £5,000, and a new market is to be established by the same body; £3,000 has been expended on a new shipping slip; commodious landing sheds and warehouses have been erected, and already increased dock accommodation is spoken of as about to be carried out.

Of the 3,159 vessels which entered inwards at Hull from foreign voyages last year, at least 1,000, we are told, were steamers, some of which made fifty voyages in the year between Hull and continental ports, and very many others ranging between twenty and thirty.

We may incidentally advert to the trade of two other important ports, Glasgow and Liverpool, during the past year.

At Glasgow the stock of wheat in granary on Jan. 1 was 175,422 bolls, or nearly the same as it was at the corresponding period last year. In comparing the imports of foreign wheat and barley for 1856 with those of the preceding year, there is a moderate increase in the former. There is also a small increase shown in the imports of beans and peas, and sack flour; but there was an increased import of about 160,000 barrels of American flour.

The direct arrivals of guano in the Clyde in 1856 comprised 10,190 tons, against 9,360 tons in 1855; but the imports were not adequate to the demand, and the stock is under 1,000 tons.

In hides and skins there was an increase of 32,338 over the preceding year.

At Liverpool there has been an enormous expansion of trade, both imports and exports; the shipments serve especially to test the industry and accumulating wealth of the kingdom. 4,563 ships, registering 2,315,439 tons, cleared from Liverpool last year with British goods, valued at £54,835,000. This is a remarkable increase in two years; the value of the exports in 1854 from Liverpool having been £46,719,177. The imports, if we had space to go into them, would tell an equally satisfactory tale; for instance, the one item of cotton shows an increase as follows:—Imports at Liverpool in 1855, 2,140,147 bales; in 1856, 2,308,509 bales; being an increase of 168,362 bales, and as compared with 1854, of 229,622 bales.

We have entered upon the present year with many raw materials, such as cotton, wool, silk, hides, oils, and tallow, standing at high relative values, and with the rather discouraging prospect that supplies may scarcely prove equal to our enlarged wants. As, however, is well observed by a leading Liverpool firm, the unfavourable inferences which to some extent are inseparable from a consideration of these circumstances, are modified by the knowledge that the advance in prices



is general, and that in the race of production our own manufacturers will be weighted with no greater burdens in this respect than their competitors in other countries. The mass of the people have been well employed; and though food has been dear, the home consumptive demand for produce and manufactures has been very large.

The declared net value of the produce and manufactures of the United Kingdom, in 1855, was nearly

£117,000,000; and the returns, when made up for the year just ended, will certainly show an excess of several millions over that amount. The official value for the eleven months already published amounts to nearly £106,000,000, against £86,500,000 in 1855; and this has been shown to be much below the real value as now given by Mr. Foulblanque, according to current prices, instead of the obsolete official values of a century or two ago.

## AGRICULTURE IN CONNAUGHT.

QUEEN'S COLLEGE, GALWAY.

On the 18th December, the Agricultural Students of the College attended on the Professor's farm at Lakeview, in this neighbourhood, for the purpose of inspecting and estimating the weight and value of the various green crops raised upon the farm during the past session.

Some of the classes had witnessed the entire process of their cultivation from the preparation and manuring of the land, to the sowing of the seed and the after-management of the young crops, and they had now come, full of sanguine expectation, to test the results, and their hopes were not disappointed.

After carefully selecting and measuring certain spaces, in order to obtain fair averages, they watched the labourers pull, and accurately weigh the different specimens chosen for trial; and from the data thus furnished, they calculated the acreable produce of each kind, and found, by comparison, that their calculations agreed with those of the "Ready Reckoner."

The following are the results of their investigations:—

### ACREABLE PRODUCE.

Crops.	Soil.	British acre.	Irish acre.
Swedish turnips.....	Reclaimed bog	tons cwt. qr.	tons cwt. qr.
Do. do. ....	Upland .....	23 0 3	37 6 2
Dale's hybrid do. ....	Reclaimed bog	28 13 3	43 9 1
Yellow globe mangold wurtzel.....	Upland .....	29 15 1	48 4 1
Long red do. ....	Do. ....	26 0 3	42 3 3
White Belgian carrots	Do. ....	27 16 3	45 2 0
Red Atringham do.	Do. ....	18 9 2	29 18 3
		15 9 2	25 1 2

These quantities do not enter into competition with the enormous yields said to have been raised in various localities; but if careful weighing and accurate calculation be deemed sufficient data from which to judge, then must they be regarded as *bona fide realities*; and we think, also, beyond the average yield of the United Kingdom, notwithstanding they have been grown upon very inferior land (which was valued by Griffith at only 7s. 2d. per statute acre), the farm being uneven and hilly, and consisting of either swampy bog or closely consolidated granitic gravel, but lightly covered with peat, and plentifully interspersed with sterile rugged rocks; and in every respect in keeping with the prevailing inferior soil of the locality.

When, four years ago, Professor Skilling got possession of the farm, it was considered only fit for poor pasture for inferior stock, and very different indeed were the crops it then produced to those it now yields. Specimens of the green crops above referred to, as those of the past season, may now be seen in the College; but they are not roots of such extraordinary size as those which are so often exhibited in seed-

shops, and ostentatiously trumpeted in the public papers; but they are in uniformity with the general character of the crops raised on the farm—handsome, well-formed, sound roots, and considerably above the average dimensions of those grown in the country around. It frequently occurs that a very large root may be selected from a very inferior crop. The largest Swedish turnip we recollect ever to have been brought under our notice, weighed 25½ lbs., and was grown in a mismanaged field, the general cropping of which was not over ten tons per acre.

The laud which has produced the crops in question has been deeply drained, subsoiled, trenched, and cleared; and all by means of manual labour, with the aid of those best of all implements—steel forks and spades. Professor Skilling, on this naturally very inferior farm, is successfully endeavouring to carry out and substantiate the views he has so long maintained and promulgated in his writings and his lectures, viz.:

1. That, agreeably to the old Roman maxim, a small farm well cultivated is better than a large one mismanaged.

2. That there is comparatively little really bad or worthless land in Ireland.

3. That comparatively few farmers know the real value and capabilities of their land.

4. That the best and most profitable mode of managing land in Ireland is by human labour, with the aid of those simple and inexpensive implements, the spade and the fork, &c., &c., and that by such means the greatest amount of produce will be obtained from any given quantity of land, be its quality what it may.

5. That low-priced labour is not, in general, cheap labour; that work judiciously and well done will always pay better than work inefficiently performed, how small soever may be the expenditure; and hence that the employment of manual labour on the farm should always, where practicable, be preferred to that which is done by horses, as it is much superior to, and has many advantages over, the latter.

6. That on every well-managed farm on which a sufficient number of cattle are kept and judiciously house-fed, there will always be an abundance of manure for all purposes, annually augmenting, which will not only raise the weight and quality of the crops, but constantly increase the fertility of the soil; and, therefore, that the purchase of foreign or extraneous manures becomes unnecessary.

7. That the common opinion among farmers, that only certain classes of inferior stock are adapted to their land, is fallacious, even mischievous; and that, as the Professor himself has proved in his own experience, even what is called very bad land may, by proper management, be made to suit the best of stock, and that all kinds of stock may be kept in any part of Ireland, if judicious and careful attention be paid to their feeding, sheltering, and general management.

In conclusion, we believe we are correct in stating that the foregoing particulars are considered by Professor Skilling as the cardinal points in successful, or what may be very appropriately termed—High Farming.

A STUDENT.

Queen's College, Galway, 22nd December, 1856.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND.		ATMOSPHERE.			WEATH.
1856-7.	s a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	s a.m.	2 p.m.	10 p.m.	
	in. ets.	in. ets.									
Dec. 22	30.01	29.92	42	46	43	W. by N.	gentle	cloudy	cloudy	fine	dry
23	30.00	29.91	36	39	34	North	airy	cloudy	cloudy	fine	dry
24	29.50	29.00	32	44	42	West	airy	cloudy	cloudy	fine	rain
25	29.88	28.93	27	31.5	29	N. East	calm	cloudy	cloudy	fine	dry
26	28.85	28.95	26	32	30	Variable	calm	cloudy	cloudy	fine	dry
27	29.04	29.18	26	32	27	N. West	gentle	fine	sun	fine	dry
28	29.46	29.70	18	33	28	N. West	gentle	fine	sun	fine	dry
29	29.98	30.10	26	38	37	West	brisk	cloudy	cloudy	cloudy	dry
30	30.15	30.20	35	45	45	W. by N.	gentle	cloudy	fine	cloudy	rain
31	30.22	30.15	42	47	47	W. by S.	fresh	cloudy	cloudy	cloudy	dry
Jan. 1	30.10	29.94	46	52	47	W. by S.	brisk	fine	fine	cloudy	dry
2	29.74	29.72	42	48	40	W. by S.	airy	fine	sun	cloudy	rain
3	29.30	29.10	38	49	43	W. by S.	variab.	cloudy	cloudy	cloudy	rain
4	29.10	29.30	38	41.5	40	W. by S.	variab.	cloudy	cloudy	fine	rain
5	29.97	29.97	32	32.5	30	N. East	brisk	cloudy	cloudy	fine	dry
6	30.00	30.21	28	34	32	N. East	brisk	cloudy	cloudy	cloudy	dry
7	30.27	30.30	27	33	32	N. East	gentle	cloudy	cloudy	cloudy	snow
8	30.30	30.24	29	40	39	S. by W.	airy	cloudy	cloudy	cloudy	sleet
9	30.13	29.82	37	47	47	S. by W.	variab.	cloudy	cloudy	cloudy	rain
10	29.53	29.18	42	49	46	N.W., S.W.	gentle	cloudy	fine	cloudy	rain
11	28.93	29.26	40	41	40	N. by W.	gentle	cloudy	cloudy	cloudy	rain
12	29.26	29.10	31	43	32	South	gentle	fine	sun	mist	dry
13	29.32	29.64	31	36	35	Variable	calm	hazy	cloudy	mist	dry
14	30.00	30.10	30	37	28	N. West	gentle	fine	sun	clear	dry
15	30.10	29.95	24	40	37	S. West	gentle	cloudy	cloudy	fine	rain
16	30.07	30.19	31	45	35	W. by N.	gentle	fine	sun	fine	dry
17	30.26	30.28	31	43	42	S. Westerly	gentle	fine	cloudy	fine	dry
18	30.28	30.27	45	49	47	S. West	brisk	cloudy	cloudy	cloudy	dry
19	30.21	30.24	40	47	36	N. West	gentle	cloudy	cloudy	fine	rain
20	29.70	30.20	33	43	34	S. West	variab.	cloudy	cloudy	fine	rain
21	29.44	29.64	29	37	32	Westerly	calm	haze	sun	cloudy	dry

ESTIMATED AVERAGES OF JANUARY.

Barometer.		Thermometer.		
Highest.	Lowest.	High.	Low.	Mean.
30.77	28.89	52	11	36.1

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
41.3	38.0	39.2

WEATHER AND PHENOMENA.

December 22. A warm day.—23 to 28. Progressive approach of the Christmas frost, which attained its utmost severity on the 25th. Thence to the end the temperature rises rapidly.

LUNATION.—New moon 27th, 8h. 45m. morning.

January 1. Airy and sunny.—2, 3, and 4. Much rain.—5 and 6. Finer.—7. Snow and sleet.—8.

Same.—9. Close rain in evening, yield 0.86 in.—10. Another great fall, 0.312 in.—11. Rain, 0.062.—12, 13, 14. Much finer.—15. More rain, and frost.—16, 17, 18. Great increase of temperature.—19 and 20. Rainy, yield 0.275 in., with snow water.—21. Fine, calm day.

LUNATIONS.—First quarter 3rd, 0h. 13 m. afternoon. Full moon 10th, 9 h. 8 m. morning. Last quarter 18th, 4 h. 50 m. morn.

REMARKS CONNECTED WITH AGRICULTURE.

The period has been marked by great and frequent transition. Short periods of frost (sufficient however to produce a moderate check) alternated with equally short periods of warmth, many degrees above a mean average. The late rains have saturated the ground, without seriously interrupting farming operations.

JOHN TOWERS.

Croyden, Jan. 22.

## CALENDAR OF AGRICULTURE.

This month is generally very favourable for the operation of ploughing, which must be pushed very vigorously in leys and stubbles, and in subsoiling. If the weather be unfavourable, and frosts and snows prevail, continue the operations of carting dung and other articles, as has been directed. Feed all live stock regularly and amply, and thrash regularly, in order to afford fresh straw.

In favourable weather pull and store turnips; use green rounds and swedes. Give oil-cake along with turnips to the cattle, and salt to the sheep.

Ewes will now require good shelter and juicy food, as the lambing season will commence. Much and delicate attention must be paid to young animals at this tender season; feed and shelter the dam, and she will feed the progeny.

Lay dung on grass lands. When dry, bush-harrow and roll, and pick off by hand all rubbish. Spread mole-hills and tufts of dung, and put gates and fences in order: float meadows.

During the whole month fell timber and cut underwoods; splash hedges and plant new ones; plant all kinds of forest trees, and cut-over those planted last year when not thriving, which produces a more vigorous growth in the new saplings from the stem. Open-ditch plantations, and fence them against summer grazing; fill up the vacancies in last year's planting. Open the hills on hop-grounds, and apply strong manures, as rotten dung, brines, and oleaginous substances; dress the roots, and plant in beds the shoots that are cut off, to come in for sets: collect and prepare all kinds of artificial manures.

In fine seasons the sowing of grains will commence in the early districts; sow beans and peas, oats and barley, and spring wheat; sow vetches for horses and spring feed. Sow on warm borders of well-prepared grounds cabbage seeds, for plants to be planted in the fields in May and June.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR JANUARY.

During the greater portion of this month, the weather has been unusually changeable. Alternate frosts and rains have been experienced; yet, as the ground has not hardened to any depth, the progress of out-door farm labours has not suffered any great interruption. The gradual decline in the value of wheat has, it has been asserted, determined many of our farmers to sow a much smaller extent of land with that produce than in some former years; and the high price of barley has induced a much greater attention to that article. We believe, however, that neither statement is absolutely correct: because, though our markets are comparatively dull, we see no reason to apprehend a very low range in the quotations, or such a depression in the state of the trade as to warrant such important changes. Besides, it is a vulgar error to suppose that land can be cultivated after any fashion—that farmers have even the power to grow wheat on soils laid down, in the ordinary course of cropping, for spring corn or green crops; and we believe that there is not that amount of despondency amongst the agricultural classes which some persons would lead us to imagine. At the present moment prices are suffering from two causes: viz., an overabundant supply of foreign produce, and the bad condition in which the new crop of wheat continues to thrash out. Upon these two features appear to hang the future. But let us calmly consider how they are likely to operate during the next three or four months. It must be admitted that the consumption of bread in the United Kingdom has continued very large; and that, in order to make good and useful flour, large

quantities of foreign wheat are necessary. Then, again, there is still a steady export demand for wheat both for Spain and Portugal, and we may safely calculate upon a considerable decrease in the importations of grain in the period just alluded to. The quantity of English wheat in stack is by no means in excess of former years, and, if consumption is fairly met, we may work off nearly the whole of the foreign grain now in warehouse. That the stock will gradually decrease is evident, because upon the present arrivals both from America and the continent there is a heavy loss, and for some time past no orders have been sent to the States for either wheat or flour. The present scarcity of money, combined with the extreme difficulty on the part of holders in getting rid of corn bills, must operate against importations, and tend to relieve our markets of the present comparatively abundant stock. Not that we anticipate any important rise in the quotations, but our impression is that good wheats will continue to command fair prices throughout the year. Barley is an article likely to be in very extensive demand. The demand for malt spirit on continental account is as active as ever, and with a fair consumption of malt liquors, prices must continue remunerative.

In reference to the yield of last year's crop of wheat, numerous complaints have come to hand; but we think that some of the growers have thrashed out too early, and thereby sacrificed capital which otherwise might have been saved. Very little old wheat is now on hand, and it is commanding a relatively high value.

Most of our markets have been well supplied with potatoes in somewhat better condition. Prime samples have sold steadily, and prices have had an upward tendency, but

inferior kinds have continued dull. The extent of the supplies since the summer confirms us in our oft-repeated impression that the growth last year was far more abundant, and in better condition than was at one time pretty generally supposed. At the present time a large quantity remains on hand, and if bread should become cheaper, we may look in vain for any great improvement in the value of potatoes. Cattle food is in abundant supply, especially beet and mangel wurzel, and large quantities of inferior potatoes are being consumed upon dairy and other farms.

The hay and straw markets have been very abundantly supplied, and although a good business has been transacted, prices in London have ruled low. Meadow hay has realized £2 10s. to £4 4s.; clover hay, £3 10s. to £5 5s.; and straw, £1 4s. to £1 9s. per load.

The imports of foreign and colonial wool have been very moderate, and the supplies of English on offer have been very limited. The trade generally has been very firm at extreme rates. Our latest advices from Victoria state that during the year ending the 10th of October, the decrease in the shipments from that colony were 3,437,421 lbs. less, compared with the previous season. The average price paid was 15½d., being an advance of 2d. per lb.

The hop trade has been steady, and prices have been fairly supported; but as Government has commenced the collection of duties in Kent, several forced sales have been effected in that county by auction, to meet claims.

In Ireland and Scotland agricultural affairs have progressed steadily, although the corn trade has been in a most inactive state.

### REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

For the time of year, very limited supplies of sheep have been on sale in the whole of the leading markets, since we last wrote; in their general quality, however, a great improvement has taken place. The bullock arrivals into the metropolis have certainly been rather on the increase, and their condition has turned out first-rate. At the present time, London is drawing its principal supplies of stock from Norfolk and Scotland, and the excellent weight in which they have as yet come to hand fully justifies the observations we have made from time to time on this head. Although prices have advanced from decreased numbers of sheep, we much doubt whether there has been any material falling-off in the quantity of consumable food, if we compare present quality with the last quarter of 1856. This is an important matter for consideration, yet it must be admitted that there are no prospects before us of any falling-off in the consumption or a material decline in the prices of stock. Unlike corn, we are not in a position to draw supplies from any quarter of the globe; they must of necessity be brought from near ports, and disposed of almost immediately on arrival, whatever may be the state of the markets. There can, therefore, be no storing, and speculation must be confined to few hands. In some quarters it is stated that the number of both beasts and sheep in the United Kingdom is comparatively small; but we believe in no such doctrine, because the supplies disposed of during the last three years—we take this period because it gives us a pretty correct notion of production—have not been much in excess of the three or four previous seasons (the additional consumption having been chiefly met by the foreigner), and because that period has been marked by productive elements and an unusually good amount of health. In point of fact, every-

thing has been in favour of the flockmaster and grazier, if we except the bad hay crop of 1855; prices have gradually advanced, production has progressed steadily, and consumption has taken off all supplies as they have come to hand. The past, then, has been a period of profit, combined with very few losses. The country, in a commercial point of view, has rapidly increased in wealth, our manufactures have flourished to an extent never before known, and the great consuming classes (London alone excepted) have been fully employed. These are important and most interesting facts for the grazier, and they cannot fail to operate as a stimulus to stock feeding throughout the United Kingdom. We find, however, that in more than one quarter the progress of Ireland, as a fat-stock producing country, is looked upon with some jealousy, and this progress is regarded as a proof that eventually prices will be as low as they were after the passing of the present tariff laws admitting foreign stock for consumption free of duty. But assuming that we receive double our present arrivals from Ireland this year, what effect we ask, are they likely to have upon value? We all know that the continent of Europe has, so to speak, strained itself to the utmost to furnish us with beasts, sheep, and calves, for the purpose of drawing largely upon our stocks of gold; but we know likewise that that source of supply is partly dried up, and that it is consequently unable to meet the demands upon it. The trade of France, like our own, has progressed at a rapid rate; the consumption of animal food has improved likewise, and this progress and improvement have had their usual influence upon the quotations. Are the prospects of 1857 less cheering, then, than were those in 1856? Shall we predict a rapid decline in our commercial greatness, because money is comparatively scarce and dear? and shall we regard the increase in the production of live stock in Ireland as an indication that meat will become cheaper? That there is room for a decline in the prices of mutton and veal we freely admit, because their continuance must lead to a falling off in the consumption, and because bread is likely to be selling at reduced rates; but our impression is that the prospects of both breeders and feeders are highly favourable, and that they will continue to secure a high value for their stock. The following return shows the importations from abroad during the month just concluded:—

Beasts.....	1,378 head.
Sheep.....	2,332 "
Calves.....	923 "
Total.....	4,633
Same time in 1856.....	3,292 head.
" 1855.....	9,102 "
" 1854.....	7,919 "
" 1853.....	12,847 "
" 1852.....	10,567 "
" 1851.....	9,018 "
" 1850.....	3,220 "

The above comparison shows the effects of the late active demand in Holland on French account; and it proves conclusively that our observations penned last year in reference to the future were founded on sound data.

The total supplies drawn from all quarters exhibited in the Great Metropolitan Market in the month have been:—

Beasts.....	19,949 head.
Cows.....	355 "
Sheep.....	81,200 "
Calves.....	1,071 "
Pigs.....	2,355 "

COMPARISON OF SUPPLIES.

Jan.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1856...	17,532	435	101,600	757	2,930
1855...	19,717	500	120,470	962	2,625
1854...	19,687	510	95,030	837	2,279
1853...	20,717	480	96,300	2,148	2,360

These figures are somewhat remarkable, and, unless properly explained, may lead even the graziers, including consumers, into error. At a glance they tend to show a considerable decline in the consumption of food in the metropolis; but we may observe that there are other influences at work which easily tend to dispel such a conclusion. In the first place, the present rapid mode of transit by railway brings to Loudon an enormous amount of slaughtered meat; and any further extension in the great railway system of the country will, no doubt, lead to a much further increase in this traffic. In the second place, we may state that it is an error to suppose that the whole of the stock sold in the Metropolitan Market is for London consumption. Hitherto the greater portion of the demand for provincial towns, certainly within a radius of thirty miles, has fallen upon London, and the stock purchased in its market has been speedily transferred elsewhere by railway. Now, however, this demand is gradually declining; we have local markets springing up in various quarters, and some of them of no mean importance, and there is a considerable increase in the supplies shown in the oldest established ones; consequently local wants are now chiefly met by local means. If the present system of country-market extension should be found to answer the expectations of the graziers, London may lose some of its importance; still it will always exercise a governing influence as regards value, both in the provinces, Scotland, Ireland, and on the continent.

Beef has sold at from 3s. 4d. to 5s. 2d.; mutton, 3s. 8d. to 5s. 6d.; veal, 3s. 8d. to 6s.; and pork, 3s. 8d. to 5s. 2d. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	Jan., 1853.		Jan., 1854.	
	s. d.	s. d.	s. d.	s. d.
Beef, from .....	2 6	4 2	3 0	4 10
Mutton .....	2 6	5 0	3 2	5 4
Veal .....	3 0	4 8	3 4	5 6
Pork .....	3 10	3 10	3 4	4 10

	Jan., 1855.		Jan., 1856.	
	s. d.	s. d.	s. d.	s. d.
Beef, from .....	3 2	5 0	2 10	4 10
Mutton .....	3 4	5 0	2 10	5 0
Veal .....	4 2	6 0	4 2	6 0
Pork .....	3 0	4 4	3 8	5 0

The arrivals of beasts last month from Norfolk, Suffolk, Essex, and Cambridgeshire amounted to 8,500 Scots and shorthorns; from other parts of England, 2,600 of various breeds; from Scotland, 2,000 Scots; and from Ireland, via Liverpool, 597 oxen.

Large supplies of Scotch and country-killed meat have been received up to Newgate and Leadenhall markets, in which the trade has been in a healthy state, as follows:—Beef, from 3s. 2d. to 4s. 8d.; mutton, 3s. 8d. to 4s. 10d.; veal, 3s. 10d. to 5s. 4d.; pork, 3s. 8d. to 5s. 4d. per 8 lbs., by the carcase.

S O M E R S E T S H I R E .

There appears to be no difference of opinion respecting the appearance of the wheat on the ground: we hear as yet of no failures or damage, and the plant is as thick and forward as is beneficial for a crop. Winter beans are much lessened in cultivation. Vetches are

looking well; they were put in in good season. Turnips have been better than it was expected they would be, and the natural grasses have afforded more keep than usual, saving the swedes and hay, the consumption of the latter being, up to this time, much less than last year. We have had very changeable weather—an appearance of a frost, wind to the north, then a sudden change to mild and rain—so that there has been very little opportunity of going on the land with wheels; and yet the quantity of rain has not been nearly so much as in some years, or the land so soaked as to waste by the cattle treading on it. The effect on the wheat thrashed has been very bad for the buyer, the condition of the wheats being much worse since the year commenced; this has made the corn trade a difficult one; besides which, flour has met a dull sale; and these causes combined tend to make the milling business a bad one since the harvest. Wheats have gradually gone down this month, except those taken before the rain, 6d. to 9d. per bushel; the best white fetches 8s.; 63lbs. red, 7s. 6d.; 63 to 64lbs. red, 7s. 3d. to 7s. 9d. The supplies have not been so large as usual this month, the weather not encouraging thrashing. On the whole, there are increasing complaints of the yield. There may be some quantity thrashed and kept back for higher prices; but although the sales this month have been decidedly shorter than last year, it is doubtful if the stock on hand is so large as then, with, considering the quality, less amount of food in flour available for, we should say, an increased consumption. Potatoes are cheaper than last year, but they have gone into consumption very fast, and not likely to supply for the next half-year the amount of food they have since harvest. It must also be remembered that barley and peas are being very little if at all used as a substitute. Barley sells from 4s. 6d. to 5s. 9d. per bushel; oats, 22s. to 26s. per qr.; beans, 5s. to 5s. 6d.; peas, 5s. 3d. to 6s. per bushel; flour, 42s. to 44s. per 280lbs. When we turn to the cattle market we find the very reverse of the corn market. Everything fat is caught up and brought to market, both of beef and mutton; the former is worth 7s. to 8s., and the latter 11s. 6d. to 12s.; the fleece, as well as the hide adding considerably to the value of the respective animals. Poor stock more than keep pace, and the prices the graziers are buying at are almost unheard of, exceeding those obtained for fat last year. The prices for barreners range from £14 to £17; good cows with calves, £20 to £24, and others in proportion, while for a pair of oxen from £40 to £50, without their being extra stock for show. There is not so much doing in poor sheep, the keep not being so abundant as to make transactions on a large scale. Lambs are coming in, and as yet the season has commenced well. Fat pigs alone are lower; they have gone down from 10s. 6d. to 9s. 6d.; poor ones realize high prices. Little doing in cheese; trade by no means brisk, and prices rather lower than higher. Very little wool in the farmers' hands, consequently we have very few sales to report.—1 Mo. 23.

L E I C E S T E R S H I R E .

A large amount of rain having fallen since the commencement of the new year, 2½ inches, active agricultural operations have in some measure been retarded—the heavy land being too wet for ploughing, and the lighter soils have not been in a good state for culture. The rivers and minor streams have inundated the low-land adjoining them, and compelled the removal of stock to higher ground, which, in consequence, has become more crowded than is convenient. It is fortunate that the upland has been stored with keep through the autumn and continues plentiful; this relieves the pressure which is now forced upon it by extra stock. Though the fluctuations in the temperature have been extreme, the weather remained open with the exception of

two or three days' frost at intervals: this has been a favourable circumstance, as stock have required less fodder than they would have done had the winter been severe. There are great complaints as to the failure of Swede turnips from premature decay, and these crops do not yield that supply of food which was expected. The cause of this disaster is not satisfactorily explained; some contending that it arises from atmospheric influences; and others, that it proceeds from the attacks of insects in the early growth of the plant. Many of the diseased bulbs appear sound to the eye, but when cut are found to be rotten within. Those farmers are wise who have this winter got a good store of mangolds: they will be found of great value as the season advances and the swedes disappear. We think the cultivation of this useful root cannot be too much encouraged. All descriptions of out-lying stock have done well hitherto—the natural food on the land being plentiful, and where deficient, the large bulk of hay secured last summer will yield a plentiful supply of fodder. This abundant crop of hay will compensate in some degree for the loss of turnips, as they will be found wanting when required to supply the beasts in the straw-yard, and hay must be the substitute, or artificial food purchased at a high price. We are glad to be able to state that both flocks and herds are in a healthy condition, and we do not hear of any epidemic of a serious nature prevalent amongst them. All kinds of store stock realize a good price. Our markets continued to be well supplied with both fat beasts and sheep, and no great variation has occurred in their value—beef, from 6d. to 7d., and mutton, the prime quality, 8d. per lb.: the offal of sheep being now valuable, as they are in their wool. We are glad to report that the favourable wheat seed-time is exhibiting the best results, and, from all we see and hear, the young crop presents a healthy appearance. The early-sown germinated quickly, and is forward for the season, and the occasional sharp frosts it has been subjected to have only given it a salutary check. The next series sown has appeared above ground, and shows a regular plant in the drills; and the last sown, if this open weather continues, will soon spring up. On the whole, at this season of the year, we have seldom had the opportunity of giving a more favourable report of this important crop. An average breadth of land has been sown with this grain, and, in this neighbourhood, there is not much left to be completed in spring; but this will in some measure depend upon the price of barley at that time; for, if it continues in the relative proportion to wheat which it now holds, there will not be any inducement to sow the land with the latter after the root crop is taken off. The price of wheat still continues to vary exceedingly—fine dry samples making from 10s. to 15s. per quarter more than the damp and rough, but the weather has of late had the worst effect upon the latter qualities. The average price of wheat has gradually declined in the last two months, and is now about 8s. per qr. lower than at that time. It is almost vain to speculate as to its future value; but, as most people form some opinion upon the subject, we will venture to give ours, and the reasons for it. The late fall has been in consequence of the increased importations of foreign wheat—being 332,414 qrs. in the last three months of 1856, against 92,427 qrs. in the last three of 1855—and we see no particular circumstances which induce us to think they will not continue for some time to the same extent. We believe the quantity of wheat in the farmers' hands, the produce of the last harvest, to be considerably more than it was this time last year, but much of it in bad condition, and not yet in a fit state to bring to market, especially in such weather as we now have; but by the end of March it will all be in good order, though the quality will not be fine. By that time the northern seas will be free from ice; and if there be any corn for exportation from those quarters, the ports will be open, and it will find its way to this country. This anticipated influx of foreign corn (should it come) with our own stock in hand, all in a condition fit for market, will cause it to be abundantly supplied, and the inference is, a further decline in price. As to what extent, it is impossible to predict; but there is no fear of wheat falling to the level of 1849-50 and '51, when the averages were respectively 4s. 6d., 40s. 4d., and 38s. 7d. The prices now in our local markets: wheat, 50s. to 60s.; barley, 42s. to 50s.; oats,

26s. to 36s.; beans, 50s. per qr.—this wide range in prices indicates the great variety in the quality. We regret to hear that considerable loss prevails in some localities from potatoes not keeping well through being infected with the disease so fatal to that root, yet we hope it is not greater than in previous years: those in camp now require looking to and sorting. The trade in wool has been very active, and a further advance has taken place: good lots are now worth 44s. per tod. Our labourers are nearly all employed at regular work, and wages vary from 10s. to 12s. per week, according to merit.—Jan. 23.

#### WEST GLOUCESTERSHIRE.

The past month has been characterized by great changes of the weather—sometimes dull and cloudy, at other times sharp frosts, boisterous winds, alternately thawing and freezing; and then a succession of very damp weather, and a deluge of rain during the day, and rimy, foggy frosts at night. Thus the general operations connected with this season of the year have been nearly suspended. There was a day or two, during the early part of the month, when the frost was sufficiently hard to permit of drawing manure on to the land; but that was only of short duration, and a very small portion of the business was accomplished. It cannot now be completed until a recurrence of frost sets in, or dry weather supervenes. The effect of so much wet, with occasional frosts, without as yet any protection from snow, has not produced any desirable effects on the wheat; but there is not, at present, cause for serious apprehension. Swedes and turnips have, however, suffered; and will do so materially, unless a dryer time commences very soon. Live stock has suffered more or less from the elements, according to the care and protection it has received, which in this district generally is very defective; and such is the adherence to old customs, that many farmers having the conveniences or the opportunity of providing them at a very trifling cost, do not avail themselves of them. There is no department in agriculture that has made so little progress as dairy management: it appears to be at a stand-still. Little or no encouragement is given to it at agricultural meetings. Prizes are given for fat cattle, and for breeding cattle calculated to produce candidates for the butcher; but no prizes are offered for good milking cows, or animals calculated to produce them. Examples are given of the best systems of feeding cattle, and the accompanying requisites of homesteads; but very few experiments are tried as to the best methods of treating dairy cows, or designs for buildings calculated for their comfort. The dairy cow requires as much shelter, although perhaps not quite so much warmth, as the feeding beast, to protect her from the inclemency of the elements; and she must be provided with it, if the economy of food and her constitutional powers are to be brought to the highest state of perfection. The operation of draining appears to be somewhat in abeyance. There has been a considerable portion of land drained within the last four or five years, but there are very extensive tracts that remain undrained, very greatly requiring it. Considerable doubts are entertained whether, according to the prevailing practice, the improvements are commensurate with the outlay. It is a subject that demands very mature consideration. The gradual decline of the price of wheat has struck many of the farmers with surprise. The damp weather that has prevailed since harvest, with only partial intervals, has not improved the condition of the grain in the ricks; and consequently there is a great quantity not in a state fit to work without admixture, and millers will only purchase these qualities at reduced rates. The price of mutton and beef maintains its ground, with a slight advance in the former. Fat pigs are worth from 10s. 6d. to 11s. per score, and stores are dear.—Jan. 23.

#### AGRICULTURAL INTELLIGENCE, FAIRS, &c.

AYLESBURY JANUARY FAIR (Friday last.)—There was a large number of horses on offer and a good attendance of dealers, but the prices asked for first-rate animals was so excessively high that but few changed hands during the day. For inferior ones there was but little or no inquiry. For cow stock trade was very brisk, and the supply being good, a large amount of business was transacted; milch cows making from

£12 to £20; barren cows, £10 to £16; stirks, £5 to £9 each. There was but little fat beef at the fair, for which there was a good inquiry, consequently all sold readily at high prices. There were but few sheep at the fair, and all sold off early at the following quotations: Store wethers, 28s. to 48s.; store tegs, 30s. to 35s. each.

**BANBURY FAIR.**—The fag-end of the horse fair is seemingly as good as the previous days, considering the quality, which is superior to former years, which has been left to be sold to-day. Prices still rule high. In the beef fair, store cattle are selling very well at good prices; and fat beef, although an excellent supply, sold for 4s. 4d. to 4s. 8d. per 8lbs. There is a short supply of fat mutton, which sold very readily at from 4s. 8d. to 5s. 6d. per 8lbs., the buyers being very numerous; the pens were all cleared by noon. The pig fair was not well supplied in quantity, but things sold at about previous prices; fat hogs fetched 11s. a score.

**BEDALE FORTNIGHT FAIR.**—The supply of fat stock was rather small, particularly sheep. Last market's prices were maintained, and sales quickly made. Holding stock and in-calfing cows were good to sell, at late rates. Beef, 7s. to 8s. per stone; mutton, 6½d. to 7½d. per lb.

**GLOUCESTER MONTHLY MARKET.**—The number of beasts was very limited, and the quality very inferior. The sheep market was well supplied, and the demand being great, the whole of the pens were soon cleared. Beef fetched from 6½d. to 7d.; mutton, 7½d. to 8d. per lb.

**GRAMPOUND FAIR.**—There was an average number of cattle, the demand for which was very good. Working oxen sold freely, and fat bullocks fetched about 65s. per cwt. There was a large number of sheep in the fair, which sold readily at rather more than 7½d. per lb.

**KELSO FORTNIGHTLY MARKET.**—There was a fair supply of fat cattle, several of the lots of which were of excellent quality. A number of buyers were in attendance, and nearly the whole were readily disposed of, at from 7s. to 8s. per stone. There was rather a small supply of sheep, which met with a quick sale at from 7d. to 7½d. per lb. A small show of cows, and sales dull; prices from £9 to £15.

**KNIGHTON FAIR.**—The supply of fat stock was quite unequal to the demand, which appeared a disappointment to the large attendance of dealers. This fair having originated with the Farmers' Club, it is to be regretted that members do not support it by sending stock. Fat sheep realised 7d. to 7½d.

per lb., fat cows 6½d. to 7d. Fresh barrens were sought after, and every description of store cattle found purchasers at good prices. Good bacon pigs were scarce, and sold readily at 6d. to 6½d. per lb. Stores were more plentiful, and remarkably dear.

**MELTON MOWBRAY FAIR.**—The show of horses was larger than on some former occasions. The absence of first-class horses caused useful ones to meet with a ready sale at good prices; many of the superior horses were selling at very high prices. There was a great number of buyers, and a good deal of business done. On Tuesday the beast show was not so large as it had been, but good things made great prices, and the heavy rain and snow which fell caused many to return without doing the amount of business they would otherwise have done.

**PENRITH FORTNIGHTLY MARKET.**—We had a fair average supply of both cattle and sheep, which sold briskly at a slight advance upon the rates of this day fortnight.

**SHREWSBURY FORTNIGHTLY MARKET.**—Best fat heifer beef sold at 6½d. per lb.; inferior a shade below that figure; fat calves, 6½d.; fat wether sheep, from 7½d. to 8½d. per lb. Useful store cattle sold well, and good cows and calves at high prices; fat pigs 6d. per lb., and stores maintained their late prices.

**TADCASTER FORTNIGHTLY MARKET.**—We had a fair supply of stock. Beef, 7s. 3d. to 8s.; pork pigs, 7s. 6d. per stone; mutton, 7d. to 7½d.; veal, 7d. per lb.

**WORCESTER FAIR.**—The supply of fat beef and mutton was small, and buyers were numerous and ready to purchase. Beef brought from 6½d. to 7½d. per lb., and even a shade over; wether mutton was readily sold at 8d., full; ewe mutton, at 7d. to 7½d. Fat pigs brought 10s. 6d. to 11s. per score. Store cattle were very plentiful, but the demand for them was extraordinarily good, and very remunerative prices were obtained. Store sheep were few, and considerable inquiry was made for them. Store pigs were sold at very good prices. Horses were not very plentiful, nor was the trade in this department at all to be compared with the business shown in other parts of the yard.

**YORK FORTNIGHTLY MARKET.**—The supply of fat beasts was below the demand, at from 7s. to 8s. per stone. A moderate number of calving and dairy cows sold at advancing rates. A fair show of grazing beasts sold at former prices. Mutton sheep were equal to present wants, at 6½d. to 7½d. per lb. Grazing sheep were scarce.

## REVIEW OF THE CORN TRADE. DURING THE PAST MONTH.

January has passed over with few of the usual stern characteristics; slight frosts at night, dissipated almost every morning with cloudy weather, often attended by rain, and a mild temperature, being the principal features of this wintry month, though frost was renewed just at the close. This state of the weather, without producing any apparent harm on the young plants of wheat—which everywhere are reported to look well—has further deteriorated the condition of the samples brought to market; and a greater reduction in prices has ensued, viz., to the extent of about 4s. per qr. on home-grown produce, new foreign having also participated in the decline, though fine old is scarcely 2s. less. The fall has partly been produced by the circumstance that deliveries have increased from the farmers in the face of unusual foreign supplies, especially from America, the ship-

ments of wheat from that country to Great Britain, from the 1st of September to the close of 1856—covering a space of only four months, and including flour—amounting to the large quantity of over one million quarters, before the previous heavy supplies of old wheat from Russia were used up. Such arrivals, coming before any deficiency in the new crop was at all felt, could not but produce a difficulty in sales, and serve to fill the granaries. Millers observing these early arrivals of fine dry wheat, ceased from their anxiety; and the rates, though lower, being above a speculative range, an almost stagnation in trade has been the consequence.

The partial opening of the Baltic and northern European ports, as well as early prospective release of numerous Russian cargoes at present shut up in ice, together with the increased facilities of

delivery by rail in America on the return of spring, all added to the heaviness. But there is a point of depression which, once reached, confidence returns; and the fact that the late American shipments both in wheat and flour leave serious losses may considerably lessen the future supplies from that country, and so give a breathing time to England to dispose of her produce with greater readiness or on better terms. Should this be the case, and the growing plants be injuriously affected by severe alternations in the temperature, cutting winds in spring, or other casualties, the tone of the markets may change, and some of the lost value be recovered. The season is not yet nearly enough advanced, here or in France, to try the resources of either country, and the artificial means employed by Government in the latter kingdom may keep prices down to the verge of a severe necessity. Spain, with all the supplies forwarded, has increased the price of cereals; the last quotations from Madrid being as high as 116s. per qr. for wheat: while at Lisbon, after a fall through liberal arrivals, 95s. 6d. was still paid. The demand for these countries still exists, though less active in the London market. Prices throughout the Baltic have been nearly stationary during the past month; Danzig top quotation was 57s., Stettin 52s. Hambro', more affected by the changes of weather, has fluctuated; for wheat on the spot there, of average quality, 56s. has been paid; for spring delivery it is 53s. per qr. Holland and Belgium, though both have been declining, still keep a high range of prices. The top price of Polish wheat at Amsterdam is 72s. 6d. per qr. France has varied little the late tendency to rise having subsided. The Roman and Neapolitan States have prices kept down by the prohibition to export. Leghorn quotes high rates, soft wheat being 66s. 6d. and hard 76s. 6d. Odessa quotations are extravagant, viz., 58s. 6d. to 70s. Petersburg quotes 58s. for Cubanka wheat. New York, though lower from the dull accounts received hence, is not sufficiently down to encourage further orders, fine white wheat being still quoted about 59s., and fine red 53s. 6d. per qr. At New Orleans the value of white wheat is 56s. There is not, therefore, at present, one port in the world whence shipments can be made here with any fair prospect of remuneration.

The first Monday in the month opened in London with abundant supplies through the previous week, though additional samples for the morning from Kent and Essex were few in number. About half the foreign supply, or over 11,000 qrs., being good useful quality from America, there was plenty of choice for millers. The comparative scarcity, however, of English samples kept prices at their former level, though sales were far from brisk. Of foreign, there

was too great a bulk to bear pressing, and rates were therefore unchanged; and in this state the market remained through the week. The country accounts generally agreed, making little or no alteration in prices. Gloucester noted a small decline, and Bristol a rather improved market. The tone of Liverpool was more decided, white wheat on Tuesday being quoted 2d. less per 70lbs., with a further general decline on Friday to an equal extent.

The second Monday gave small returns of English wheat, and but a moderate supply from abroad, with free exports to Spain. The show of samples for the morning from Kent and Essex was unusually limited, and this circumstance saved the market from a fall, the state of trade for home consumption being exceedingly restricted. The movement in the country was slightly downwards, though Hull reported a rather improved business; but Norwich, Newcastle, and Manchester were 1s. to 2s. per qr. cheaper. Liverpool again reported a more decided decline, namely, a fall of 2d. per 70 lbs. on Tuesday, and nearly as much on the following Friday.

The third Monday in London was more a day of suspense than business, though the receipts during the previous week, both from the country and foreign ports, were comparatively small, with but a moderate sprinkling of samples from the near counties for the morning. The condition was certainly deteriorated further by the damp weather, but there were several fine samples, both of white and red wheat, on show, for which factors were scarcely inquired the price, and it is doubtful had they been offered at 5s. reduction whether it would have secured their placement. Inferior parcels were offered freely at 2s. per qr. less to no purpose, and nearly all the samples remained on the stands at the close of the day unsold. A report of this kind it was fair to suppose would produce a corresponding feeling in the country; but as lower prices had generally been successively quoted there, while the metropolis was only stationary, there was less of depression than expected; but a small general reduction was noted. Leeds, Spalding, and Newark were 1s. cheaper. Hull, Birmingham, and Bristol made the decline about 1s. more. Gloucester and Norwich were fully 2s. down. Liverpool was more depressed, quoting the fall on Tuesday at 3d. to 4d. per 70lbs, with great stagnation in business at this reduction on the following day. By Friday the London market was in a condition to quote prices, when the sales of English wheat were at 3s. per qr. less.

The last Monday showed fair arrivals of both foreign and English wheat, with an unusual supply of American flour. Kent and Essex again sent



but slender contributions. But this day was little better than a repetition of the previous Monday, with the disadvantage of a lower price by 3s. for good qualities; Friday's quotations alone being asked, but only given in very few instances. All new foreign out of condition was in a similar plight, while dry samples would have been gladly placed at a decline of 1s. to 2s. per qr. There being a smart frost on Wednesday, the markets, generally, exhibited a much firmer tone in London, needy buyers had to pay fully 1s. per qr. more money. At Liverpool there was also some buoyancy. Should America continue her exports as freely as of late, she alone will have furnished this country by 1st September next, in wheat and flour, to the extent of about 3,000,000 qrs.; but the check in prices here, and the claims of other countries upon her, make both her power and disposition to do so doubtful, and the effects of the present depression may be felt on the eve of harvest. The quantity imported into London during the last four weeks in English wheat has been 24,164 qrs., in foreign 65,222 qrs.—more than half being from the United States; making a weekly average supply of 22,346 qrs.: this being against 34,519 qrs. weekly in December last, shows a weekly diminution of no less than 12,173 qrs. The exports in four weeks were 14,860 qrs. wheat, 9,449 qrs. barley, 116 qrs. oats, 3,532 sacks flour, and 3,256 qrs. Indian corn. The importations of foreign wheat and flour into the principal ports of Great Britain for four weeks was 434,158 qrs. The total imports into the United Kingdom for the year 1856 was 4,083,075 qrs. wheat, and 3,932,920 cwts. flour; against 2,791,247 qrs. wheat, and 2,016,649 cwts. flour in 1855: showing an increase of 1,291,828 qrs. wheat, and 1,916,271 cwts. flour; which, taking the cwt. at two bushels, equals 1,770,896 qrs., or  $1\frac{3}{4}$  millions, over 1855, the importation having proceeded at a double rate since last June.

The flour trade through half the month remained almost stationary as to prices, with great dulness in sales, both in country and American descriptions. On the third Monday, a reduction of 1s. was noted in Norfolk and country sorts; and to sell States flour in quantity, a like decline was submitted to. On the fourth Monday, there was a further decline in country sorts of 2s. to 3s. per sack, and in American barrels of 2s. per brl. Frost on the last Wednesday recovered 1s. per sack on Norfolk. The total decline, therefore, in the month, has quite equalled that in wheat for country sorts, being 3s. per sack; and in American it has been fully 3s. per brl., some forced sales making the fall still greater. Town millers have not, however, changed their top price, which has nominally kept at 60s. per sack, it being necessary for its manufacture to

procure the best old foreign wheat for this purpose, for which as high as 85s. has recently been paid for 61lb. Dantzic. The importations into London have been, for four weeks, in country sacks, 64,757; foreign sacks, 1,847; and barrels 65,780; showing some decrease in the receipts of both, as compared with December.

Barley, though still high-priced, has somewhat given way, maltsters being indisposed, unless compelled by the scarcity of samples, to pay the price demanded for the best quality, and a more liberal importation of foreign, through the openness of the season, having met the large demand for distillation. On the first Monday, a full price was paid for the best sorts, and the market for such was called 1s. dearer; but the rise was entirely limited to first-rate malting. Little or no change ensued on the two following Mondays; but on the last day, a decided reduction took place of 2s. per qr. on the choicest parcels, all below this quality, except inferior grinding sorts, being neglected, though offered at this decline. The quantity of malting must be limited; and the whole growth of this grain is, undoubtedly, below an average; but its relative dearness, as compared with wheat, is calculated to lessen the consumption, both for malting and distillation. The imports for the four weeks, into London, have been 19,270 qrs. English, and 36,086 qrs. foreign, giving a weekly supply of 13,838 qrs., which shows a decrease as compared with the previous month; but large purchases being made on the other side of the water, and an early opening of the Baltic being expected, prices have been partly influenced downwards by anticipation. Malt has undergone little variation, the only change being to 1s. less per qr. on the closing Monday. The importations of barley in 1856 were 735,888 qrs., against 360,297 qrs. in 1855.

Oats have undergone scarcely any change of value through the entire month, though supplies have considerably fallen off, the same anticipation of early arrivals from the Baltic appearing to deter buyers from getting largely into stock, there being seldom sufficient rise in this grain to pay much over granary expenses. The first three Mondays made no alteration in quotations, and the last only quoted a decline of 6d. per qr. The liberal imports during the last three months of the past year occasioned the storing of some considerable quantity of Russian quality, which now meet the necessities of consumers at moderate rates. Ireland still sends sparingly, and, by a diminished growth there, the arrivals towards the season's close seem likely to run short. During the past four weeks London has received 7,554 qrs. English, 3,979 Scotch, 10,437 Irish, and 46,205 foreign—giving a weekly

average of only 17,044 qrs. The total imports in 1856 were 1,155,563 qrs., against 1,085,283 qrs. in 1855.

Beans and peas have been a dragging trade all through the month, and finally were quoted fully 1s. per qr. lower, the open weather greatly diminishing consumption. Beans have been plentiful—the English supply reaching to 4,262 qrs., and the foreign, chiefly Alexandrian, being 6,857 qrs.—the average for each week being 2,779 qrs; and as the crop is good in England and fair in Egypt, and consumption will decrease with the advance of the season, a recovery to former prices seems unlikely. Peas have been far less plentiful: but the demand has been unusually limited, especially for boilers, which continued on a parity with those used for hog feed. The prices being less than for barley seem scarcely susceptible of much reduction. The imports into London for the four weeks in January were only 1,576 qrs. English and 1,710 foreign, which in times of brisk demand would not be thought heavy as a week's supply. The quantity imported in 1856 of beans was 355,084 qrs. and of peas 79,140 qrs.—showing a decrease as compared with 1855 of 27,707 qrs. beans and 43,540 qrs. peas.

Linseed has almost risen 1s. per qr. every market-day. Stocks getting more and more reduced, and prices advancing in Russia and India, with an increased demand from foreign countries, the rise on seed has been 3s. to 4s. per qr. in the month, and on cakes 10s. to 15s. per ton, with a good demand. The cloverseed trade, after long reserve on the part of buyers, has commenced, and, though white seed has hitherto been neglected, red has been in request, and American, from its superior quality, has risen from the first appearance of samples 3s. to 4s. per cwt.—prices being 70s. to 74s. French, though held high, not being so good in quality, has not experienced this improvement, or even a ready sale, though the markets in France begin to show an upward tendency. Some fine English begins to appear, and is held at 84s. per qr. Trefoil is firm at 30s. to 33s. per cwt. New foreign tares are cheap, being offered at 40s. per qr. Canary has rather declined. Hempseed and mustardseed continue dull, and nominally the same. Carraway, Coriander, and other seeds remain as last quoted.

**CURRENCY PER IMPERIAL MEASURE.**

	Shillings per Quarter.	
WHEAT, Essex and Kent, white, new	50 to 60	extra — to 68
Ditto, red, „	49	56 — 60
Norfolk, Linc. and Yorks., red, new	48	56 — 60
BARLEY, new, malting	37 to 40	Chevalier.... 42 49
Distilling	36	Suffolk..... 30 32
MALT, Essex, Norfolk, and Suffolk	66	71 — 76
Kingston, Ware, and town made	68	72 — 77
Brown	62	63 —
RYE	—	30 40
OATS, English, feed	24 25	Potato..... 25 32
Scotch, feed	26 30	Potato..... 27 33
Irish, feed, white	—	21 25 fine 25 29
Ditto, black	—	20 23 — 26
BEANS, Mazagan, new	31 33	Ticks, new... 32 31
Harrow	36 38	Pigeon..... 40 42
PEAS, white boilers	39 42	Maple .. 39 40
Grey	37	38
FLOUR, per sack of 280lbs., Town, Households	58s.	fine 59 60
Country	40	41..... Households... 44 46
Norfolk and Suffolk, ex-ship	—	39 40

**IMPERIAL AVERAGES.**

FOR THE LAST SIX WEEKS:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Dec. 13, 1856	60	1	43	1	23	5	42	1	43	7	41	10
Dec. 20, 1856	60	5	43	0	25	6	40	2	42	8	40	9
Dec. 27, 1856	59	8	43	11	23	7	39	9	42	4	40	2
Jan. 3, 1857	58	1	44	18	23	5	39	2	41	5	40	9
Jan. 10, 1857	58	10	44	7	23	8	38	5	41	7	39	9
Jan. 17, 1857	59	4	45	7	23	4	40	2	40	5	39	6
Aggregate average	59	5	44	3	23	10	40	0	42	0	40	6
Same time last year	77	6	39	4	26	10	54	0	48	7	47	2

**PRICES OF SEEDS.**

**BRITISH SEEDS.**

CLOVERSEED, red, per cwt.	60s. to 80s.
Ditto white „	65s. to 84s.
TREFOIL, per cwt.	25s. to 30s.
TARES, per bushel	5s. 0d. to 6s. 0d.
CORIANDER, per cwt.	20s. to 24s.
CANARY, per qr.	70s. to 78s.
HEMPSEED (none)	—s. to —s.
CARRAWAY, per cwt., new	—s. to 50s., old —s. to —s.
LINSEED, per qr., sowing	—s. to —s., crushing 69s. to 71s.
LINSEED CAKES, per ton	£11 0s. to £11 10s.
RAPESEED, per qr., new	86s. to 88s.
RAPE CAKE, per ton	£5 0s. to £5 10s.

**POTATO MARKETS.**

**SOUTHWARK WATERSIDE, MONDAY, Jan. 26.**—During the past week the arrivals coastwise have been moderate, but larger by rail, which have been more than equal to the limited demand. The following are this day's quotations:—

York Regents	per ton	90s. to 120s.
Kent and Essex do.	100s. to 130s.	
Lincolnshire do.	80s. to 100s.	
East Lothian do.	100s. to 130s.	
Do. reds.	80s. to 90s.	
Perth, Forfar, & Fish. Reg.	90s. to 105s.	
Do. reds.	70s. to 75s.	
German whites	50s. to 70s.	

**COUNTRY POTATO MARKETS.**—**YORK, Jan 17:** A fair supply of Potatoes. They sold at from 8d. to 9d. per peck, and from 2s. 8d. to 2s. 9d. per bush. **LEEDS, Jan. 20:** A moderate supply of Potatoes, which sold at from 10d. to 11d. wholesale, and 11d. to 12d. per 21lbs. retail. **RICHMOND, Jan. 17:** Potatoes 4s. per bush. **MANCHESTER, Jan. 22:** Potatoes 8s. 6d. to 10s. per 252lbs.

**ENGLISH BUTTER MARKET.**

**MONDAY, Jan. 26.**—We note a slow trade in Butter, and nothing but English Fresh maintains its price.

Dorset, fine	None.
Do. middling	104s. to 108s. per cwt.
Fresh	12s. to 16s. per doz.

**WOOL MARKETS.**

**BRITISH WOOL MARKET.**

**CITY, MONDAY, Jan. 26.**—An unusually small supply of English Wool is now on sale. For all kinds we have numerous inquiries, but as most of the holders refuse to sell except at further advanced rates, the business doing is very moderate. The prospect of our market may be considered favourable, both as to demand and value.

**LEEDS WOOL MARKET, Jan. 23.**—There has been a fair extent of business done this week, and prices of both combing and clothing wools are firmly maintained, with an upward tendency.

**LIVERPOOL WOOL MARKET, JAN. 24.**

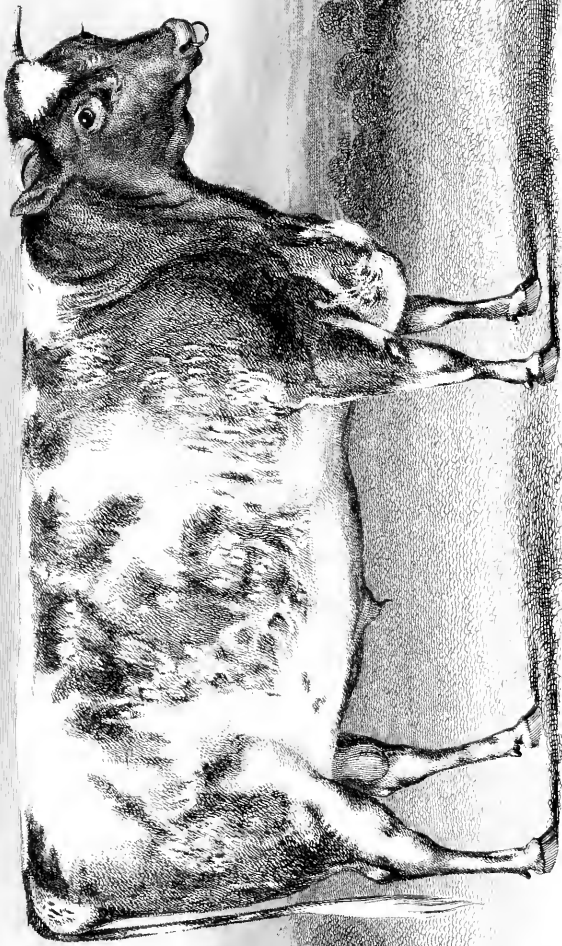
**SCOTCH WOOL.**—There is still a good inquiry for laid Highland wool, but at the advanced rates consumers buy with great caution; stocks, however, are light, and it being still nearly six months before the new clip can come to market, there seems little chance of any lower rates before then. White Highland is still wanted. The stocks of Cheviots and crossed in first hands are light, and command full rates.

**FOREIGN WOOL MARKET.**

**CITY, MONDAY, Jan. 26.**—The accounts from the various foreign wool markets report continued firmness, with an active demand.

**LEEDS FOREIGN WOOL MARKET, Jan. 23.**—There is a fair demand for the various qualities. The supply of Australian wool being much below an average, prices are very firm.









# THE FARMER'S MAGAZINE,

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## PLATE I.

“THE GRAND MASTER,”

A YEARLING SHORT-HORN BULL,

LATE THE PROPERTY OF HENRY AMBLER, ESQ., OF WATKINSON HALL, HALIFAX.

The Grand Master, a roan bull, bred by Mr. Ambler, was calved on the 31st of January, 1855, and got by The Grand Turk (12969), dam Crocus, by Sweet William (7571), g. d. Cowslip, by Prince Ernest (4818), gr. g. d. Carnation, by Mowthorpe (2343), gr. gr. g. d. Carmine, by Ambo (1636), gr. gr. gr. g. d. Catherine, by Burley (1766), gr. gr. gr. gr. g. d. by Isaac (1129), gr. gr. gr. gr. g. d. by Pilot (496), gr. gr. gr. gr. g. d. by Albion (14), gr. gr. gr. gr. g. d. by Lane Bull (359), gr. gr. gr. gr. g. d. by Shipton (587), gr. gr. gr. gr. g. d. by Son of Suworrow (636), gr. gr. gr. gr. g. d. by Son of Twin Brother to Ben (88), gr. gr. gr. gr. g. d. by Twin Brother to Ben (660).

In 1855 The Grand Master, when only seven months old, took the first prize in his class, and a silver medal as the second best of all the prize animals, at the Caldervale Agricultural Society's Meeting, being only beaten by his own sire, The Grand Turk, for the cup to the best bull.

In 1856, at the Royal Dublin Society's Spring Show, he took the second prize for yearling bulls against no less than 133 competitors; and in a class, too, pronounced as remarkable for their excellence as for their extraordinary numbers.

At the Paris Universal Exhibition, in the June of the same year, he took the first prize of a thousand francs and the gold medal, as the best of all the young bulls.

The Grand Master was sold immediately after this, at a long price, to Mr. Green, who has sent him out to Sydney; and the whole of Mr. Ambler's famous herd are announced for sale by Mr. Strafford on the 1st of April, at the Hall Farm, near Halifax. They include the celebrated bull “The Grand Turk,” sire of “The Grand Master.”

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## PLATE II.

A CART MARE AND FOAL.

THE PROPERTY OF LORD FITZWILLIAM.

This mare received, with her foal, the first prize as the best for agricultural purposes at the last meeting of the Yorkshire Society. She is eleven years old, and by Nelson, dam by Nelson Hero. In, as is usual at these meetings, a very strong show of horses of all sorts, she was particularly admired; and she is indeed a very fine mare, with a good head, famous frame, and light quick action; in a word, a capital specimen of one of the best kinds of cart-horse we have. The foal, too, was deservedly commended.

Lord Fitzwilliam is celebrated for good nags of all breeds; for the thorough-bred hunters he mounts his men on, as well as for his hacks and harness horses. Two of the house of Fitzwilliam, moreover, have some very high-bred cattle entered in their names.

## VESTED INTERESTS.

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

When the great Paley was explaining the use of the institution of property, and illustrating the advantages of an arrangement apparently so paradoxical and unnatural, he described the chief of its advantages as being well classifiable under four heads—1. That it increases the produce of the earth. 2. That it preserves the produce of the earth to maturity. 3. That it prevents contests; and, 4. That it improves the convenience of living. These rights are nowhere held more sacred than in this country; amongst no other nation are the laws of property or vested rights more carefully regarded than with us. Our courts of law are ever astute in finding a remedy for every infringement of these privileges; for this great object they decide and re-decide, draw the nicest distinctions, split hairs with the greatest industry and becoming gravity. These results, however, of their so-often-conflicting decisions not seldom approach the verge of the publicly injurious and ridiculous, rather than vested rights should be trenchd upon. This industrious leaning to the rights of property displays itself at every turn. On this occasion, however, let us only examine how the senate and the courts have conducted themselves with regard to running and other waters. I select that class of cases because in them the farmer is very often very materially interested.

The continuance of the 300,000 acres of fenland which once difgured and rendered unhealthy Lincolnshire and two or three of the adjoining counties, was long and pertinaciously defended, in spite, too, of the rules which Paley quoted. Mobs broke down the banks, filled up the drains of the Bedford level; the Parliament of the Commonwealth declined to interfere; courts acquitted the rioters, who long successfully pleaded for the continuance of these swamps, lest as they urged, the trade in thatching-rushes and wild ducks should be spoilt (*Jour. Roy. Ag. Soc.*, vol. iv., p. 309; vol. viii., p. 87). But we need not go so far back as the days of the unhappy Stuarts, to find how pertinaciously the property in even bog or pond water was protected by the courts. In the year 1808, for instance, it was gravely decided in the case of "Balston v. Benstead" (1 *Campbell*, 463), that the owner of a stone quarry could not be allowed to pump the water out of his own stone pit, if it diminished the supply of water in his neighbour's spring.

But there are limits even to the existence of

legal absurdities; for, in 1843 and 1853, in the cases of "Acton v. Blundell" (12 *M. and W.*, 346), "Wood v. Waud" (3 *Eschequer*, 748), and in "Greatrex v. Hayward" (8 *Eschequer*, 293), the court did at last solemnly decide that a farmer might drain his own land, although by so doing he did also lower the water in his neighbour's pond! The court not only now began to wake up, but to be facetious on the subject. Baron Parke, amongst other remarks, quoting Chief Baron Pollock's words in "Wood v. Waud," that "the flow of water for twenty years from the eaves of a house could not give a right to the neighbour to insist that the house should not be pulled down or altered, so as to diminish the quantity of water flowing from the roof. The flow of water from a drain for the purposes of agricultural improvements for twenty years, could not give a right to the neighbour, so as to preclude the proprietor from altering the level of his drains for the greater improvement of his land." And the late Baron Alderson, of happy memory, added, "Take the case of a farmer who, under the old system of farming, has allowed the liquid manure from his fold-yard to run into a pit in his neighbour's field; but, upon finding that the manure can be beneficially applied to his own land, has stopped the flow of it into his neighbour's pit. Could it be contended that the fact of his neighbour having used this manure for 20 years would give the latter the right of requiring its continuance?"

So now it is pretty well decided that a farmer may drain his land, although by so doing he drains the fields of a neighbour, or perhaps intercepts or diminishes its flow towards an adjoining water-mill.

The mention of water mills will remind my readers of other injurious legal absurdities connected with flowing waters, and with the drainage and irrigation of land. Here the millowner presents himself with his claims, which not only frequently border on, but go far beyond the bounds of the ludicrous. He is wont to assert his right to all the water of the river, to impede the flow of its water at his convenience—of a river, mark ye, which is Nature's own drain, intended, amongst other chief purposes, to dry and render wholesome and cultivateable by man, the basin or valley by whose drainage-water that river is entirely constituted.

The formation of water mills, the damming-up of the water, was first tolerated from the conveni-



ence they afforded—the difficulty of procuring any other motive-power at an equally reasonable rate. Time, however, has fortunately produced the steam mill; and whilst it has very materially diminished the value of the water mill, has in no degree lessened the anxiety of its owner to preserve its privileges intact. Mark how jealously he watches the farmer who ventures to water his meadows with a portion of the stream; how he denounces, and perchance drags into a court of law, any one who uses a well near the spring which feeds his mill-pond; how he even tries to prevent the roads being watered with that which comes from a well; how sturdily he labours to prevent a town from being thus supplied with pure water; how anxious he is to compel its inhabitants to return to the dirty water which they previously consumed—on the plea that he has an abstract legal right to the old flow of even the underground springs which feed wells!

Have not my readers seen many of such farces enacted? Is not the slightest alteration of even the flow of a town sewage the object of a millowner's jealous interference? Were not the citizens of Coventry threatened with an injunction by a millowner, whose little mill was worked entirely by the city's sewage? Were not the inhabitants of Hitchin sued for daring to use their own river? Cannot the men of Stratford-on-Avon tell a similar story? Are not the inhabitants of Croydon now being attacked by a millowner, who is unwilling that they shall either let the town sewage run into the stream or be diverted out of it? Do not, in fact, the millowners of the Nene contend that all the rain-water which falls in that valley descends for the primary purpose of turning the water-wheels of its numerous mills? Do they not believe that every pot of water bestowed on the gardens of their neighbours indirectly, though remotely, is a robbery of water from their mill streams?

But whilst the millowner is thus struggling to maintain his exclusive right to the water, what far greater, even national interests are sacrificed! what diseases are engendered! what lands are undrained! Let the reader who has any doubt on these heads read the detail so truthfully given by Mr. Wood when speaking on the improvement to be made in land by amending the channels of rivers and water-courses (*Jour. Roy. Agri. Soc.* vol. xiii. p. 369); by Mr. Henderson, who relates the obstructions to good drainage presented by the milldams of the Rye and the Derwent (*ib.* vol. xiv., p. 130). Then let him refer to Mr. Evershed's similar details with regard to the Mole and the Wey (*ib.* p. 418); to still more extensive injuries described by Mr. Clarke (*ib.* vol. xv. p. 3) in his account of the miseries this kind still tolerated in the valley of

the Nene (*ib.* p. 61); and in the same volume, at p. 427, where Mr. Ruegg details the similar Dorsetshire injurious absurdities.

Our astonishment at these things is not lessened when we trace the support which courts of law have in bygone days afforded to the claims of mill-owners. In *Greenslade v. Halliday* (1830, 6 *Bingham* 379) great was the struggle to decide whether a farmer who had the right, for the purpose of irrigating his land, to dam up a small stream with some stones, might put a board with a couple of stakes to steady it, instead of the stones!! In *Embry v. Owen* (in 1851, 15 *L. Jurist*, 633), the court, however, tardily arrived at the reluctant conclusion that a farmer *might* take water from a river for irrigation purposes if he returned it not diminished injuriously in quantity. The learned barons even decided that "one's common sense would be shocked by supposing that a riparian owner could not dip a watering-pot into the stream in order to water his garden, or allow his family or his cattle to drink it"!!!

But the millowners are not the only class who present obstructions to the drainage of lands and towns. Are not the metropolitan commissioners at this very moment driven from one proposed outlet on the Thames banks to another by the opposition of some place or other? Do not the commissioners still persist in throwing away what ought to be employed in the irrigation of grass lands? Will they never be content to derive their knowledge from Nature's great book! will they still rely on the chemist and the engineer for impracticable purifications, when the farmer's grass can perform such operations in a way far beyond our chemical imitation? Has not Providence even provided in the animal world, unpaid and rarely regarded little scavengers who pursue their allotted tasks undirected and unthanked? Some of these have been well referred to by the Rev. Charles Kingsley in his "Glaucus; or Wonders of the Sea-shore" (a little work which will well repay my readers' perusal). He, too, has noticed (p. 131) that all the invaluable laws and methods of sanitary reform at best are but clumsy imitations of the unseen wonders which every animalcule and leaf have been working since the world's foundation, with this slight difference between them and us—that *they* fulfil their appointed task, and *we* do not. And, as he humorously and instructively adds, when he is speaking of one of the marine scavengers whom he had netted on some boat excursion: "If the House of Commons would but summons one of these little *Paramecia* from any Thames sewer-mouth, to give his evidence before their next Cholera Committee, sanitary blue-books, invaluable as they are, would be superseded for ever and a

day, and Mr. Monsell would no longer have to confess that he knows of no means of stopping the smells, which are driving members out of the house and the judge out of Westminster Hall. Nay, in the boat of which I have been speaking, sat a fellow-passenger, who was a greater adept at removing nuisances than the whole Board of Health put together, and who had done his work, too, with a cheapness unparalleled, for all his good deeds had not as yet cost the State one penny. True, he lived by his business; so do other inspectors of nuisances. But Nature, instead of paying Maia Squinado, Esquire, some £500 sterling per annum for his labour, had contrived, with a sublime simplicity of economy, which Mr. Hume might have envied and admired afar off, to make him do his work gratis, by giving him the nuisances as his perquisites, and teaching him how to eat them. Certainly (without going the length of the Caribs, who uphold cannibalism because they say it makes war cheap, and precludes entirely the need of a commissariat) this cardinal virtue of cheapness ought to make Squinado an interesting object in the eyes of the present generation, especially as he was at that moment a true *sanitary martyr*, having, like many of his human fellow-workers, got into a fearful scrape by meddling with those existing interests and 'vested rights, which are but wrongs,' which have proved fatal already to more than one Board of Health: for, last night, as he was sitting quietly under a stone, in four fathoms water, he became aware (whether by sight, smell, or that mysterious sixth sense, to us unknown, which seems to reside in his delicate feelers) of a palpable nuisance somewhere in the neighbourhood; and, like a trusty servant of the public, turned out of bed instantly, and went in search, till he discovered, hanging among what he judged to be stems of tangle (*Laminaria*) three or four large pieces of stale thornback, of most evil savour, and highly prejudicial to the purity of the sea and the health of the neighbouring herrings. Happy Squinado! he needed not to discover the limits of his authority, to consult any lengthy Nuisances Removal Act, with its clauses and counter-clauses, and exceptions, and explanations of interpretations, and interpretations of explanations. Nature, who can afford to be arbitrary because she is perfect, and to give her servants irresponsible powers because she has trained them to their work, had bestowed on him and on his forefathers, as general health inspectors, those very summary powers of entrance and removal in the watery realms, of which common sense, public opinion, and private philanthropy are still entreating vainly in the terrestrial realms. So, finding a hole, in he went, and began to remove the nuisance without 'waiting twenty-four hours,'

laying an information, 'serving a notice,' or any other vain delay. The evil was there, and there it should not stay; so, having neither cart nor barrow, he just began putting it into his stomach, and in the meanwhile set his assistants to work likewise. For, suppose not, gentle reader, that Squinado went alone; in his train were more than a hundred thousand as good as he, each in his office and as cheaply paid, who needed no cumbrous baggage-train of force-pumps, hose, chloride-of-lime packets, white-wash, pails or brushes, but were every man his own instrument, and, to save expense of transit, just grew on Squinado's back. Do you doubt the assertion? Then lift him up hither, and putting him gently into that shallow jar of salt water, look at him through the hand-magnifier, and see how nature is *maxima in minimis*.

"There he sits, twiddling his feelers (a substitute, it seems, with crustacea for biting their nails when they are puzzled), and by no means lovely to look on in vulgar eyes; about the bigness of a man's fist, a round-bodied, spindle-shanked, crusty, prickly, dirty fellow, with a villanous squint, too, in those little bony eyes, which never look for a moment both the same way. Never mind, many a man of genius is ungainly enough; and Nature, if you will observe, as if to make up to him for his uncomeliness, has arrayed him as Soloman in all his glory never was arrayed, and so fulfilled one of the few rational proposals of old Fourier, that scavengers, chimney-sweepers, and other workers in disgusting employments, should be rewarded for their self-sacrifice on behalf of the public weal by some peculiar badge of honour or laurel crown. Not that his crown, like those of the old Greek games, is a mere useless badge; on the contrary, his robe of state is composed of his fellow-servants. His whole back is covered with a little grey forest of branching hairs, fine as the spider's web, each branchlet carrying its little pearly-ringed club, each club its rose-crowned polype; like, to quote Mr. Gosse's very happy comparison, the unexpanded buds of the acacia. In that leg grows, amid another copse of the grey polypes, a delicate straw-coloured Sertularia branch, or branch of tiny double combs, each tooth of the comb being a tube containing a living flower; on another leg, another Sertularia, coarser but still beautiful; and round it, again, has trained itself, parasitic on the parasite, plant upon plant of glass ivy, bearing crystal bells (*Campanularia integra*), each of which, too, protrudes its living flower; on another leg is a fresh species, like a little heather-bush, of whitest ivory (*Crisidia eburnea*), and every needle-leaf a polype-cell. Let us stop before the imagination grows dizzy with the contemplation of those myriads of beautiful atoms. And what is their use? Each living

flower, each polype-mouth, is feeding fast, sweeping into itself, by the perpetual currents caused by the delicate fringes upon its rays (so minute, these last, that their motion only betrays their presence), each tiniest atom of decaying matter in the surrounding water, to convert it, by some wondrous alchemy, into fresh cells and buds, and either build up a fresh branch in their thousand-tenanted tree, or form an egg-cell, from whence, when ripe, may issue, not a fixed zoophyte, but a free swimming animal. And in the meanwhile, among this animal forest, grows a vegetable, one of delicatest seaweeds, green and brown and crimson, whose office is, by its everlasting breath, to re-oxygenate the impure water, and render it fit once more to be breathed by the higher animals, who swim or creep

around. Mystery of mysteries! Let us jest no more. Heaven forgive us if we have jested too much on so simple a matter as that poor spider-crab, taken out of the lobster-pots, and left to die at the bottom of the boat, because his more aristocratic cousins of the blue-and-purple armour will not enter the trap while he is within."

Let me follow Mr. Kingsley's example, and pray to be forgiven if, in endeavouring to detail the ludicrous absurdities of damp, unwholesome, dammed-up valleys and persecuted sanitary commissioners, I have treated too lightly the miserable yet half-tolerated vested rights that impede the cultivation of thousands of acres of Nature's best soils, that, moreover, are now wont to spread fever, with all its attendant desolations, around many a hearth.

### THE PROPER ADJUSTMENT OF OUR WEIGHTS AND MEASURES.

The subject mooted in the House of Commons on Thursday evening, when leave was given to bring in a bill to amend the law relating to weights and measures, is one of very great importance, and one which we have long desired to see discussed and legislated upon. The uniformity of weights and measures is not only deemed of importance in this country, but is occupying attention very generally throughout the continent, in the United States, and the British colonies. The gross inequalities in the weights and measures in use in different parts of the United Kingdom and her dependencies is not only discreditable and perplexing, but involves an immense amount of extra labour in calculations and accounts among merchants and dealers. There can scarcely be two opinions as to the desirability of adopting weight as a standard of measure for grain and meal, instead of variable measures of capacity, differing materially even in neighbouring localities. Again, what can be more discreditable than the antiquated scale of weights and measures with which trade has been embarrassed in England and its dependencies?—the pound as the unity of weight, with its heterogeneous multiples and divisions of ounces, pennyweights, and grains; of stone, quarter, hundredweight, and ton; moreover, occasionally, duplicates of these, as the pound troy and the pound avoirdupois, the stone of fourteen and the stone of eight pounds, &c.

An imperative uniformity is what is asked for; but there is something more than this required, and some very useful modifications might be adopted, if the Government would but take up the matter in earnest, and give the subject that close and important careful consideration which it demands, and which any useful measure emanating from the leading commercial nation of the world should inevitably receive. Although difficult to wean people from old customs, yet the attempt has been successfully carried out before, here and elsewhere. The passive resistance on the part of the public which the Chancellor of the Exchequer dreads will yield

gradually, as the advantages of the reform become palpable.

A more discreditable ponderary and metrical system than that which is now in use here has seldom existed; and a proper knowledge of English weights and measures is therefore most difficult to be acquired.

A return presented to the House, not long since, shows that while the imperial bushel, meant to be the standard, contains 8 gallons, the bushel by which grain is sold in the Middlesex markets contains  $8\frac{1}{2}$  gallons, in Salop  $9\frac{1}{2}$ , in Cheshire nearly 10; in some parts of Cornwall 16, in others 24; in Westmoreland 16 for wheat and 24 for barley and rye. In Suffolk and Norfolk the coomb of 4 bushels is used; in some parts of England the load, containing—in Bedfordshire 5 bushels of wheat, in Derbyshire and Yorkshire 3. In some districts of the north the boll of 2 imperial bushels is used, in others the old boll of 6 bushels. In Wakefield, Leeds, and Barnsley, wheat is sold by the bushel of 50 lbs.; at Doncaster by the bushel of 60 to 63 lbs., according to agreement. In Lincolnshire generally the weight is 63 lbs. At Gloucester, Birmingham, Worcester, Wolverhampton, and other places it is 62 lbs., at Shrewsbury 75 lbs., in Monmouthshire 70 lbs., in Liverpool, Hull, and other markets 63 lbs.

In view of this remarkable diversity Mr. Bass might well observe, that "he did not believe any gentleman in the House could tell the meaning of a sack of wheat in England, of a barrel of wheat in Ireland, or of a boll of wheat in Scotland."

The evils of the system are beginning to work their own cure to some extent by the discussion they are provoking. From time to time the matter of a more uniform system of weights and measures, especially for agricultural produce, has been discussed at farmers' meetings and markets. Only last month we reported an influential meeting held at Gloucester, where one of the largest assemblages of farmers, millers, landlords, and corn-merchants met to consider the propriety of

establishing a uniform system of buying and selling corn, and agreed upon the adoption of 60 lbs. as the standard weight for wheat. Also an important discussion at Wolverhampton. Such local demonstrations, however, are perfectly useless unless seconded by the Government, in enforcing uniformity throughout the kingdom. The Chancellor of the Exchequer starts a difficulty, as respects the averages for the Title Commutation Act; but the bushel is invariably taken at 60 lbs. for the purpose of the averages.

The feeling of the Government on this, as on the decimal coinage, appears to be that the country is scarcely ripe for decisive measures. But what motive can be gained by further delay? The alteration must be made some time or other, for the convenience of commerce; and the earlier the initiative is taken the better. The masses will soon come to understand it; indeed, as regards the uniformity of grain measures, it will scarcely touch them; for the corn dealers, millers, farmers, importers, and speculators are too intelligent a class to be materially inconvenienced by any alteration of this kind.

Decimal weights, or the net 100 lbs. ought, however, at the same time to be introduced, that calculations may all go in arithmetical progression. The present division of cwts. qrs. and lbs. is an old-fashioned, clumsy, inconvenient absurdity, which might be abolished with advantage. Why not make ten scruples one drachm, ten drachms one ounce, ten ounces one pound, ten pounds one stone, ten stones one cwt., ten cwts. one ton. The introduction of such a progressive system would greatly simplify commercial transactions of all kinds, and do away with most of the difficulties which beset the study of numbers.

In various countries active co-operative measures are now being taken to bring about a more general agreement in commercial and agricultural customs, weights, and measures. An international association has been formed, with permanent committees sitting in London and Paris, one of whose especial objects is to promote a more general uniformity of weights and measures.

In Germany the pound of 500 grammes has, by a Convention which comes into force on the 1st of July, next year, been very generally adopted by most of the states of the Zollverein, Austria, Prussia, &c. Sweden and Norway are adopting the decimal system for their money, weights, and measures. We cannot compel other nations to adopt our system; but if the advantages of simplicity and uniformity are made palpable, they will soon fall into the train of such reforms as may be carried out.

The Massachusetts Legislature enacted a law which came into force on the 1st June, 1855, regulating the purchase and sale of grain, ground and unground, by a fixed standard of weight, and requiring all sales to be made by it. The following enumeration of the number of pounds reckoned to the bushel in the United States may be of interest to farmers and dealers:—Of wheat, 60 lbs.; of shelled Indian corn, 56 lbs.; of corn in the cob, 70 lbs.; of rye, 56 lbs.; of oats, 36 lbs.; of

barley, 48 lbs.; of potatoes, 60 lbs.; of beans, 60 lbs.; of bran, 20 lbs.; of cloverseed, 60 lbs.; of timothy-seed, 45 lbs.; of flaxseed, 58 lbs.; of hempseed, 44 lbs.; of blue grass-seed, 15 lbs.

The American Geographical and Statistical Society recently addressed the Congress of the United States, demanding that in future every civilized people should make use of the same weights and measures, and that these should be according to the metrical system. The decimal system would be preferable to the metrical.

In New Brunswick and in Canada the Provincial Legislature has enforced the buying or selling of all grains, roots, &c., by weight.

While the matter is under discussion, and before any bill is definitively passed, we should like to see some action taken for the abolition of the continued use of many of the foreign measures, Dutch and French, in the conquered or ceded colonies of the Cape of Good Hope and British Guiana, Mauritius, and Lower Canada: muids and schepels, and numberless other foreign terms, might with advantage be swept away.

There is also ample room for some attempt at reform in the heterogeneous and variable weights and measures of British India. The maunds and seers, factory and bazaar, all differ at the three Presidencies; so with the baskets, the arobas, and piculs, and a hundred other foreign metrical terms which have been grafted unnecessarily into our commercial tariffs at British ports, and which by commercial usage might even be greatly simplified or entirely superseded. The growing intelligence of the natives would soon recognize and adopt English weights and measures.

The whole code of our customary weights and measures, home and colonial—lasts, loads, tons, sacks, chaldrons, &c.—requires a thorough investigation and a complete reform; and we shall be glad to see the various divisions and additions which are allowed by the customs of places or the usages of different trades, completely abolished. We may assuredly approximate to uniformity in the possessions under our own rule, if we cannot succeed in inducing other countries to fall at once into our views of expediency and advantage.

**THE BEST MODE OF COLLECTING AGRICULTURAL STATISTICS.**—This subject was discussed at a recent meeting of the Botley and South Hants Farmers' Club, when the following resolutions were passed, although not without some opposition and dissent:—"That this club is of opinion that there is no objection to returns being made of the land in the occupation of farmers; showing the average of the several crops it is in the course of producing." "That in the event of its being considered necessary by the legislature to obtain an estimate of the probable amount of such crops, that object may be best effected by learning the production of some one year, and that to be taken as a standard; and by general estimate, which should express by figures the amount in each year compared to the known production of the standard year." "That it would be sufficient for every useful purpose to collect the statistics of stock and live animals once in ten years." "That all statistical returns should at once be transmitted to a central authority."

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held on Wednesday, the 4th of February. The following Members of Council and Governors of the Society were present: Mr. EVELYN DENISON, M.P., President, in the Chair; Earl of Powis, Lord Berners, Lord Portman, Lord Walsingham, Sir John Villiers Shelley, Bart., M.P., Sir Watkin Williams Wynn, Bart., M.P., Sir Edward Halse, Bart., Sir John V. B. Johnstone, Bart., M.P., Sir Archibald Keppel Maedonald, Bart., Mr. Alcock, M.P., Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Barthropp, Mr. Bramston, M.P., Mr. Bullock, Mr. Cavendish, Colonel Challoner, Mr. Hodgetts Foley, M.P., Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Hudson (of Castleacre), Mr. Jonas, Mr. Lawes, Mr. Lawrence, Mr. Miles, M.P., Mr. Milward, Mr. Pope, Mr. Allen Ransome, Mr. Shuttleworth, Prof. Simonds, Mr. Thompson, Col. Townley, Prof. Way, Mr. Jonas Webb, and Mr. Wilson (of Stowlangtoft).

Thomas William Evans, Esq., of Allestree Hall, Derbyshire, was elected a Governor of the Society.

The following new Members were elected:—

Allerton, George Rice, Barling, Rochford, Essex  
 Attwood, Francis, The Close, Salisbury  
 Baker, John, Morialta, Adelaide, South Australia  
 Banks, George, Highgate, Kendal, Westmoreland  
 Bell, William, Gleadthorpe House, Mansfield, Notts.  
 Bloss, William, Brunlish, Fraulingham, Suffolk  
 Boycott, Richard, Bridgworth, Shropshire  
 Butler, Hon. Charles Lennox, Coton House, Rugby  
 Butler, William, Badminton, Chippenham, Wilts.  
 Camps, Henry, The Park, Oakley, Cheltenham  
 Cattley, John G., Peshurst, Kent  
 Cully, John, Easton, Pewsey, Wiltshire  
 Denison, His Excellency Sir William, Governor-General of New South Wales  
 Dixon, Hugh, Devonshire House, Claughton-cum-Grane, Birkenhead, Cheshire.  
 Duppa, Francis B., Hollingbourne House, Maidstone, Kent  
 Evans, Edwin Paul, Hazlewells, Hightley, Bridgworth  
 Fitzhugh, Thomas Lloyd, Plas-power, Denbighshire  
 Forrest, Thomas, Spurstow Hall, Tarporley, Cheshire  
 Fox, Charles Burton, The Firs, Newport, Monmouthshire  
 Gamble, Thomas, Canwick Grove, Lincoln  
 Halford, Thomas, Kerry-Newtown, Montgomeryshire  
 Hall, Henry John, Kempt Terrace, Woolwich Common  
 Hean, Thomas Rice, Paradise House, Kildysart, Co. Clare  
 Hickman, Edward, Duraford House, Salisbury  
 Hodgkinson, Enoch, Morton Grange, Retford, Notts.  
 Horner, William, Hamel's Farm, Puckeridge, Ware  
 James, Isaac, Tivoli, Cheltenham  
 Lees, John, Reigate, Surrey  
 Lock, George, Instow-Barton, Barnstable, Devon  
 Matthews, Thomas, Sporie, Swaffham, Norfolk  
 Mellor, John, Smallwood, Lawton, Cheshire  
 Micklethwaite, Rev. John, Iridge Place, Hurstgreen, Sussex  
 Mills, R. F. W., Dunnington, Yorkshire  
 Mills, S. M., Orcheston, Devizes, Wilts.  
 Mills, Stephen, Elston House, Devizes, Wilts  
 Minch, I. F., 28, Mincing Lane, London  
 Morrice, John Walter, The Tower, Cat-Thorpe, Rugby  
 Morris, Richard, Knockin Heath Farm, Oswestry, Salop  
 Nicholson, John, Barford-St.-Martin, Salisbury  
 Norman, John Newcomb, Hamboro'-magna, Rugby  
 Protheroe, Rev. George, Whippenham, Isle of Wight  
 Pryse, Captain, Goguddan, Aberystwith, Pembrokehire  
 Rigden, Richard, Salisbury  
 Roby, Robert, Canwick Grove, Lincoln.  
 Sheldrake, Edward, Ixworth-Thorpe, Bury-St.-Edmund's  
 Simpson, Benjamin Southby, Boston, Lincolnshire

Slator, Thomas, Beston, Lincolnshire  
 Spearing, William, Chilbolton, Stockbridge, Hants.  
 Stubs, Joseph, Park Place, Frodsham, Cheshire  
 Sykes, John, Croes-Howell, Wrexham, Denbighshire.  
 Williams, W. E., Pwll-y-Pant, Cardiff, Glamorganshire  
 Williams, Rev. James, Tring, Hertfordshire.

FINANCES.—Mr. Raymond Parker, Chairman of the Finance Committee, presented the report on the accounts of the Society, and laid before the Council the usual quarterly statement of the income and expenditure, and of the assets and liabilities, of the Society. The current cash-balance (including the subscription of £1,500 from Salisbury) in the hands of the Bankers was £2,723.

EXPENSES.—On the motion of Lord Portman, the following resolution was agreed to: "That a Committee be appointed to inquire into the expenses of the Society, with power to consider specially what arrangements can be made to diminish the expenses of the country meetings of the Society. That the Finance Committee, with the President, Trustees, and Vice-Presidents, be the said Committee, and be requested to report to the Council Meeting in March."

HOUSE.—Mr. Raymond Barker, Chairman of the House Committee, reported on the execution of the reports ordered at a former Council.

JOURNAL.—Mr. Thompson, Chairman of the Journal Committee, laid on the table a copy of the new Journal, along with a report from the Committee, referring, among other topics, to the new index of the previous volumes of the Journal, and announcing the satisfactory arrangements made with the Royal Veterinary College for the publication of lectures delivered by the professors of the institution, before the members of the Society.

CHEMICAL LECTURES.—Mr. Wren Hoskyns, Chairman of the Chemical Committee, reported the recommendation of the committee that lectures on the following subjects should be delivered by Professor Way, the consulting chemist to the society, in the course of the present season:—

I. On the solubility of manures, and to what extent it is desirable.

II. On the relation of the soil to vegetation.

SALISBURY MEETING.—Lord Portman, Chairman of the General Salisbury Committee, reported the progress of the inquiries of the Committee on points connected with the preparation of the Show-yard and the question of a Pavilion dinner. The council accepted from the authorities of Salisbury a schedule of prizes for Hampshire Down sheep, amounting to £120. Colonel Challoner, chairman of the Implement Committee, reported the recommendations of that committee on the subject of the terms and conditions of the prizes to be offered in that department of the show. Orders were then given by the council for the final arrangement and publication of the two prize sheets for the Salisbury meeting.

MEMBER OF COUNCIL.—On the motion of Mr. Milward, seconded by Mr. Hudson, of Castleacre, Mr. Thomas Pain, Mayor of Salisbury, was unanimously elected a member of the council, in the vacancy occasioned by the lamented decease of Mr. Woodward.

GUANO DEPOSITS.—A communication having been read from Mr. Caird, in reference to the guano deposits at Koorya-Moorya, on the coast of Arabia, the President was requested by the council to wait upon the Earl of

Clarendon, as a deputation from their body, and to represent to his lordship the importance, at the present time, of the supplies to be derived from that locality.

The council then adjourned to their weekly meeting on the following Wednesday, at which all the members of the society have the privilege of attending.

A WEEKLY COUNCIL was held on Wednesday, the 11th of February. Present, Mr. Raymond Barker, Vice-president, in the chair; Mr. Alcock, M.P., Mr. Caird, Mr. Cavendish, Captain Elston, Mr. Jonathan Gray, Rev. L. Vernon Harcourt, Mr. Fisher Hobbs, Mr. Nyberg (of Sweden), Prof. Simonds, Mr. Trimmer, Count G. de Wesele (of East Prussia), and Prof. Way.

DEPOSITS OF NITRE.—Prof. Way, the Consulting-Chemist to the Society, presented the report of his chemical examination of the mineral specimens received at the Foreign Office from Pernambuco, and transmitted to the Society by direction of the Earl of Clarendon. The most remarkable of these specimens was one of almost pure saltpetre, which Prof. Way valued at £38 per ton. The nitrous deposits whence this specimen had been obtained extended beyond a range of 20 miles.

Further communications were received from the Foreign Office, announcing the discovery of immense tracts of other saline substances in the neighbourhood of Para in Brazil.

ARABIAN GUANO.—Mr. Caird, in reference to the late guano expedition to the Koorya-Moorya Islands, produced a sample of the guano, which he had received from Captain Ord that morning, the quality of which seemed greatly to resemble that of Ichaboe. Captain Ord had arrived from Bombay in the steamer Colombo on the previous day, and had brought with him large samples of the guano, which would be immediately placed in the hands of Prof. Way for analysis. On the single island of Haski he estimated the quantity of guano at upwards of one million tons, and there were likewise very large deposits on two other islands in the same bay, all of which had been ceded by the Imaum of Muscat to the British Government. Had it not been for the war with Persia the necessary armed protection against the pirates of the coast would have been afforded, and many cargoes might have been by this time on their way to England. As there was now some hope of that war being brought to a speedy conclusion, Mr. Caird was happy to announce that by the previous night's mail the officer second in command of the last expedition had been despatched to Bombay to organise a second expedition, in the hope that the Bombay Government might then be able to spare a ship for their protection, the Government here having promised to recommend that aid to be granted if the other demands of the service admitted. Every exertion would be made to load one or two small cargoes before the setting in of the monsoons in May, in order to have as early a test as possible both of the quality and quantity in bulk. It might of course happen that, with so little time to work upon, it might be impracticable to accomplish this; but at all events matters would now be put into a train for commencing operations on a large scale immediately after the monsoons in August next. The importance of securing this supply for England could not be overrated. It was the best means in their power of checking the Peruvian monopoly. But there was also a mode of operating on that monopoly which he for one was determined to adopt. He would not use the Peruvian guano at all at its present price, but would substitute superphosphate, bones, &c., for his root crops, and nitrate of soda for his corn and grass crops. In this opinion he was strengthened by that of his friend Mr. Hudson, of Castleacre, who had come to a similar determination;

and though he was averse to any principle of exclusive dealing, yet he believed they were justified in meeting this monopoly in any effective manner, and he had no doubt that a pretty unanimous determination on the part of British agriculturists to abstain from the use of Peruvian guano while the price continued so high, would have a telling effect on the Peruvian monopoly.

A discussion ensued—

1. On the injurious effects arising from the improper use of guano on imperfectly drained land, especially in the case of root crops, and in that of pregnant ewes and other animals fed upon them; and on the greater economy of manure from ordinary sources.
2. On the improvement gradually introduced into the manufacture of superphosphates.
3. On the adoption of measures for effecting a reduction in the present high charge for guano.
4. On the frauds practised by unprincipled and irresponsible persons, intermediate between the importer and the local salesman, for the purpose of adulterating guano.
5. On the question of damp and damaged guano being now kiln-dried, mixed up with sound guano, and the whole mixture sold as genuine guano.
6. On the preference farmers had shown for Ichaboe over Peruvian guano for Turnip crops, in consequence of the less amount of ammonia and the greater proportion of phosphates the former contained.
7. On the white crust of phosphate of lime covering deposits of guano near the Red Sea; in consequence of the decay of the organic matter, and the concretion of the mineral substances in that manure, this crust, now valued at £6 or £7 per ton, having been thrown into the sea by thousands of tons as worthless, from ignorance of its real value, for the purpose of getting to the guano-beds beneath it.
8. On the form in which manure must be presented to the roots of plants in order to be absorbed as food; and on well mixing manure with the soil in autumn.
9. On the question of drill-manuring, and whether the manure is by them presented under the most favourable condition to the plant.

These points were discussed with much interest by Mr. Caird, Prof. Way, Mr. Alcock, M.P., Mr. Fisher Hobbs, Mr. Cavendish, Prof. Simonds, and the Rev. L. Vernon Harcourt.

CATTLE DISEASE.—Communications were also received from the Foreign Office on the subject of the Mecklenburg Cattle Distemper. Professor Simonds remarked that the English Government had interdicted the importation of cattle from Prussia, while the Swedish Government had interdicted the importation of English cattle: the ground of interdiction in the latter case being the fear of introducing pleuro-pneumonia. The mouth and foot disease of 1839, which existed in the English markets and showed itself strongly in the late Paris Show, was occasioned by the animals' over-exertion (during transit by steamers and railways), and an unusual privation from food.

The meeting concluded with statements connected with—

1. Mr. Athaw's new lever-fork for loosening the soil between rows, manufactured by Parkes, of Birmingham, and sold by Burgess and Key, Newgate Street.
2. On the price of ploughing by horses under different circumstances, compared with ploughing by steam apparatus; and on the durability or otherwise of wire ropes used in the latter case for traction, and the wear and tear generally of steam-ploughing, economically considered.
3. On the early attempts at steam locomotives on common roads, at Glasgow, Brighton, and in the Kent Road; the machine in the first case exploding, in the second being unable to go up a hill, and in the third being incapable of being stopped on going down.
4. Mr. King's Australian wine, of fine Hungarian quality,

as the first produce of wine-growing in that British colony.

5. Specimens of the agricultural products of Algeria, collected during the past long vacation in that province of France by Mr. Wingrove Cooke, and by him presented to the Society.

The Council, having ordered their usual acknowledgments for the favour of the communications made to them, adjourned to the 18th of February.

A WEEKLY COUNCIL was held on Wednesday, the 18th of February: present, Mr. MILES, M.P., Vice-President, in the Chair, Lord Camoys, Mr. Aytown, Mr. Raymond Barker, Mr. Crampus, Colonel Challoner, Mr. James Chapman, Dr. Crusius (of Leipzig), Mr. Evelyn Denison, M.P., Mr. Dent, M.P., Mr. Jonathan Gray, Rev. L. Vernon Harcourt, Mr. Majendie, Mr. Hall Maxwell, Mr. Pocock, Mr. Thomas Scott, Professor Simonds, Professor Way, Mr. Burch Western, and Mr. Wood.

Communications were laid before the Council from the Rev. Thomas Cator, on the stoppage of drains by fibrous substances; from the Rev. G. F. Holcombe, on the combination of muscular power with the weight of the animal body constantly changing its centre of gravity, applied to the working of Turnip-cutters and other small machines usually kept in motion by the muscular power of the arms only; from Mr. Charles Poppy, communications on the subject of the cultivation of Millet as a stall-feeding and stover crop; from the Earl of Clarendon, a despatch from Mr. Vines, English Consul at Pará, in Brazil, on the probability of large deposits of guano along the Atlantic coast of South America, and in its bights, and on the actual existence of abundance of saltpetre on both side the Cordilleras; as well as the occurrence in the district of Hullaga, not only of crystalline beds of common salt, covering an area of 4,000 square miles, but a positive mountain, on the Tiraca, 70 miles N.E. of Tarrapólo, in Peru, of the same salt, only slightly mingled with gypsum—the water communication between these localities and the ports of Pará or Macapá being uninterrupted; from Mr. Long, on the value of sugar-scum as a manure; from Mr. Breach and Mr. Perry, suggestions for the construction of steam-ploughing apparatus; and from Mr. Grimstone, of Hightgate, a supply of his Egyptian Peas.

These communications having been received with the usual acknowledgments, discussions ensued on topics having reference to them as well as to the following points:—

1. On the best mode of applying liquid manure for green crops.
2. On the action and effects of Chandler's water-drill.
3. On the advantages of following that drill by the roller and presser.
4. On the care required in not exceeding the proper amount

of guano with the water-drill; and the advantage of a full supply of the superphosphate.

5. On the economy of applying manure to the crop, and not diffusely to the soil; and the question whether in the case of the water-drill, the manure is not applied too widely to the land, instead of especially to the crop.
6. On a return to many of the older systems of manuring, as in the case of bones.
7. On the best means of facilitating the draught of drills over the land.
8. On the Locust Bean, and the peculiar combination of elements which renders it a fattening food for cattle.
9. On the Norwich Rice-cake as food for cattle.

These discussions led to the communication of much personal experience on their practical bearing from Mr. Miles, M.P., Mr. Dent, M.P., Lord Camoys, Professor Way, Mr. Scott, Rev. L. Vernon Harcourt, and Professor Simonds.

Mr. Miles took that opportunity of referring to the late Mr. Pusey's experiments, four years ago, on the advantages of Chandler's Water-Drill, made by Reeves, of Westbury. Mr. Pusey had compared its effects with that of the dust-drill, and found that with 6 cwt. of superphosphate per acre in each case the water-drill produced  $13\frac{1}{2}$  tons of Turnips, while the dust-drill only produced  $6\frac{1}{2}$  tons. Mr. Pusey had deduced the following general results from his experiments:—

1. After some years' experience of these two drills, he determined to abandon the use of the dust-drill in flat drilling, and to use the water-drill only.
2. By means of the water-drill, he had found it an advantage that the operation may at once proceed in dry weather.
3. That the manure, by its use, was better diffused in the soil for each rootlet to feed upon.
4. That the expense of about 4s. per acre for ashes, required by the dry drill, was saved by using the water-drill.
5. That the water-drill required much less labour of horses and men; especially as by means of gutta-percha pumps the boys who drive can fill the water-carts also.
6. Generally, that where water is at command within a reasonable distance, the water-drill should, in his opinion, supersede the dust-drill altogether in flat-work for Turnips, such as is used in the south of England.

Mr. Miles, having seen these experiments during their progress, could fully bear testimony to the value of Chandler's Water-Drill, as ascertained by Mr. Pusey and others, both in reference to the action of the superphosphate and other manures. Mr. Miles added, that there never was a time when farmers were in greater want than at the present moment of what might be termed *auxiliary* manures.

The Council adjourned to Wednesday, the 25th of February, at 12 o'clock.

## THE MANURES WHICH CAN BE MOST ADVANTAGEOUSLY EMPLOYED AS SUBSTITUTES FOR GUANO.

At the Monthly Meeting of the Highland and Agricultural Society, on the 18th Feb., Dr. Anderson read the following paper:—

The price of artificial manures and their fluctuations in value are questions of the highest importance to the farmer, and have every year been forcing themselves more and more strongly on his attention. The steady increase in the price of guano has rendered their relative

economy infinitely more important than it was, so long as that substance could be obtained on moderate terms; and now that a further and very considerable increase in its price has taken place, the question has acquired a very different aspect, and it comes to be a matter of consideration whether the farmer can any longer afford to employ it; and if not, by what substances it can be most advantageously replaced. In bringing these points

under the notice of the society, I shall, even at the risk of repeating matters already familiar to many of our members, commence by a short recapitulation of the mode in which manures act, for the purpose of pointing out what is required both for a general and special manure, and thus laying down some fixed principles on which we may judge how far guano and similar substances fulfil what is required of them. The great fundamental principle on which a manure is employed depends upon the fact that every plant during its growth accumulates in its system a certain quantity of matter essential to its existence, which it derives partly from the soil, and partly from the air. From the former it extracts the fixed mineral matters which exist there, and there only; while from both it obtains supplies of its organic food, that is of the water, carbonic acid, ammonia, and nitric acid, required to build up that greatly preponderating portion of its mass which is combustible. Plants grow naturally without cultivation, because the soil and the air always contain a certain quantity of the elements they require; and as they either die in the spot where they grew, or are consumed by wild animals, these substances sooner or later find their way back to the soil, there to commence a new cycle of similar changes, so that a certain moderate production continues from year to year. But when agriculture comes into operation these conditions are changed; the crop is removed from the soil and consumed elsewhere, and though the air will still afford the elements which are derived from it as abundantly as before, the next generation of plants must find in the soil a diminished supply of the substances it obtains from thence. The necessary consequence is, that if the cultivation of plants be continued, the quantity of valuable matters in the soil becomes less and less, until at length they are so much reduced as to be no longer sufficient to maintain the growth of plants, and the soil is then said to be exhausted. To restore the fertility of such an exhausted soil, vegetable matters or the dung of animals, which consists to a large extent of partially decomposed vegetable matters, must be returned to the soil; and herein lies the simplest, the oldest, and the most generally-employed method of manuring, and the only one possible, so long as the principles on which a manure acts were unknown. But now that the progress of scientific knowledge has enabled us, in place of considering farm-yard manure as a whole, to estimate the advantages derived from each of its numerous constituents, we have come to see that it may not in all cases be an indispensable manure, but may to a certain extent be replaced by other substances. In fact, when we inquire more minutely into the cause of the diminished fertility of a soil from which a succession of crops has been removed, it is found rarely to depend on the general exhaustion of all the requisite elements, but most commonly on the deficiency of one or more substances which have been removed by a certain number of crops, while the others still remain in sufficient abundance. And hence the fertility depends not so much on those substances which are abundant, as in those which are most deficient, and the absence of which renders the others useless, because the plants cannot grow without an adequate supply of *all* their constituents. A soil in this condition does not absolutely require farm-yard manure, but may be again made to produce abundant crops by the application of the one deficient substance, which is then called a special manure. When so treated, a soil will retain this renewed fertility for a certain time, but at length becomes again infertile, even under a continued application of this manure, which is then said, in ordinary language, to have lost its effect, although the real reason is that the supply of a second constituent has been exhausted, and it also must be supplied in the form of a manure. In all

that precedes, we have supposed it to be required merely to keep up a certain moderate fertility, such as an ordinary soil may be supposed to possess in a state of nature. But agriculture does a good deal more than this, and seeks to produce a larger amount of vegetation than the natural soil can do, without extraneous aid—an effect which may manifestly be always produced by supplies of farm-yard manure, sufficient to afford a superabundance of all the different constituents of plants. But it is obvious that we may succeed equally well without it, if, as will frequently happen, some of the constituents be abundant, and their utility be limited by the deficiency of only one or two. Thus, for instance, we may conceive a soil containing a superabundance of all the mineral elements of the plant, but no ammonia or other nitrogenous matter, in which case the produce will be limited by the quantity of ammonia which the plants can obtain from the air during their period of growth, and may be greatly increased by a special manure containing nothing but that substance; so, likewise, it may happen that even where farm-yard manure has been applied in very large quantity, the addition of a special manure may still be advantageous; because, as ordinary dung consists of the constituents of plants, minus those substances which have been retained by the animals which fed upon them, it may be desirable to supplement deficiencies so produced; or if the crop to which it is applied happen to require an unusually large quantity of any particular element, it may be advisable to add an extra quantity of that substance, so as to bring out the full effect of its other constituents. It cannot fail to be observed that, according to the definition now given, there is a very important distinction to be drawn between a general and a special manure. When the former is used, all the constituents of plants are added to the soil; and not only is its fertility maintained, but, if they be used with sufficient liberality, its productive capacity may be materially increased. Whereas, on the other hand, a special manure adds nothing to the permanent fertility of the soil, but only renders its existing constituents more rapidly available, and hastens rather than defers its exhaustion. Such, at least, would be the case if special manures were employed alone, a method rarely practised, and which, in my opinion, should be scrupulously avoided, except under very special circumstances. But if special manures be employed along with farm-yard manure, the result is different. A given quantity of the latter can, of course, produce only a certain amount of crop; but if mixed with a special manure, it is more rapidly converted into vegetable matter, and this is advantageous to the farmer. It may be urged that this is a matter of little moment, and that sooner or later the farmer receives back what he has put into the ground. But this is not the case; during six months of the year manure lying in the ground is undergoing decomposition, although there are no plants to make use of it, and the constituents then set free are in part at least washed away and lost. Even if none of it were lost, it would not be altogether a matter of indifference; for, to take an extreme case by way of illustration, if we suppose a part of the manure to remain undecomposed for fourteen years after its application, it will, if only five per cent. interest on its price be reckoned, have cost the farmer twice as much as that which was consumed during the year of its application. While, therefore, I consider the use of special manures alone a most injudicious and short-sighted policy, which can rarely be employed with advantage, there is no question that their proper combination with farm-yard manure is really one of the most important improvements ever introduced into the practice of agriculture. If the principles now laid down be applied to the estimation of special manures, we see that the substances most advan-



tageously applicable are those rich in the constituents in which the soil or farmyard manure are most commonly deficient, or which serve to promote the rapid absorption of those they do contain. Chemistry alone does not enable us to arrive at a certain knowledge of these points, but must be supplemented by the results of field experience; for the question does not entirely depend upon the proportion in which these substances are present, but to a very great extent also in the degree to which they are immediately available to the plants. The results of analysis, however, have shown us that there are two substances always existing to a very small extent in the soil, namely, ammonia and phosphoric acid, and a third, viz., potash, which is rarely very abundant\*, while all three are most important constituents of plants. The results of precise experiments in the field, as well as everyday practice, show that the two former are also most important and essential constituents of special manures, and invariably remunerate the farmer for the expense of application. In regard to potash our information is much more limited, but what we do know leads to the conclusion that its salts are very uncertain in their results. Experiments made two years since at the instigation of the Highland Society, showed that sulphate and muriate of potash produced little or no effect on grain crops; but great anticipations were formed of the advantage of applying them to potatoes, which, however, have not been confirmed during the past season; and an experiment with carbonate of potash, by the late Mr. Pusey, also proved unfavourable. A special manure must be valuable, therefore, exactly in proportion as it contains these substances, and especially the two former of them; and hence it is that guano maintains so high a position among fertilizers. If, then, it be wished to compare with one another a number of different manures, all that we have to do is to observe the relative quantities of these substances; and if we wish to calculate its money value, it is only necessary to ascertain the prices at which those substances can be purchased in the market, all of them being obtainable as commercial articles in some form or other. Agricultural chemists have endeavoured, as far as possible, to fix the market value of the different constituents of manures, and have arrived at results which differ somewhat from each other. The following table gives the value per ton attached to the principal constituents of such manures by Mr. Way, Dr. Hodges, Mr. Nesbit, and myself:—

	Way.			Hodges.			Nesbit.			Anderson.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Ammonia.....	56	0	0	56	0	0	60	0	0	56	0	0
Insoluble phosphates.....	7	0	0	7	0	0	8	0	0	7	0	0
Soluble phosphates	32	13	0	25	0	0	24	0	0	28	0	0
Potash† .....	30	16	0	20	0	0	..	..	..	20	0	0
Alkaline salts .....	1	0	0	1	0	0	1	0	0	1	0	0
Organic matters..	1	0	0	10	0	1	0	0	0	..	..	..

These are supposed to represent fair average prices, but that of ammonia is rather under the present market

\* The quantity of potash is sometimes not more than twice as large as the phosphoric acid; but in other cases it is ten and even twenty times as abundant.

† Mr. Way's valuation for potash is certainly much too high, and even that adopted by Mr. Hodges and myself is considerably above the price at which it can be obtained from kelp. Cut weed kelp, containing about 18 or 20 per cent. of potash, can be purchased for from £2 10s. to £3 per ton. At the latter price, even if we put no value on any of the other constituents of the kelp, potash costs only about £15 per ton. If we allow the ordinary value of the sulphate of soda, common salt, and phosphates, contained in kelp, the cost of the potash is under £13 per ton.

price, which is at present from £60 to as high as £63 per ton. Further, it is to be noticed that though potash is stated, it is very doubtful whether, owing to the uncertainty of its action, it ought to be generally estimated. The same is true of the organic matters, which exist in the soil and the farmyard manure so abundantly that the few pounds added to an acre in the portable manures do not merit notice. For this reason, I do not reckon organic matters or potash, except in a manure which is deliberately used for the purpose of applying it. To come now to the more immediate subject of discussion, we must, before attempting to discover what are the best substitutes for Peruvian guano, endeavour to define its true value, which the preceding table enables us to do. An average Peruvian guano contains:—

Water .. .. .	13.72
Organic matter and ammoniacal salts ..	53.16
Phosphates .. .. .	23.48
Alkaline salts contain 5.00 of potash ..	7.97
Sand .. .. .	1.66
	100.00
Ammonia .. .. .	16.5
Phosphoric acid in the alkaline salts equal to 5.21 phosphate of lime ..	2.50

and calculating from the preceding table, its value per ton is, according to

Way, .. .. .	£13 19 0
Hodges, .. .. .	13 0 0
Nesbit, .. .. .	13 12 0
Anderson, without potash, ..	12 8 0
Do, with potash, .. .. .	13 0 0

It may be urged against these calculations that the prices assumed are not exactly those which must be paid for the different substances, and that at least ammonia is estimated considerably under its present market price. Let us see, therefore, what is the actual cost at which a similar mixture could be produced at the present time, assuming £68 per ton as the price of ammonia, £8 for phosphates (at which high rate Mr. Nesbit reckons them), and £13 for potash, as obtained from kelp; we then find that we have for 100 tons as follows:—

53 tons organic matter at ..	£1 ..	£53
23.5 tons phosphates at ..	8 ..	188
3 tons potash at ..	13 ..	39
5.21 tons soluble phosphates at ..	28 ..	145
16.5 tons ammonia at ..	68 ..	1120

£1515

Or at the rate of £15 9s. per ton, estimating at the present high market prices of all its constituents. At the present moment guano is selling in quantities under 30 tons at from £14 15s. to £15 per ton; and it may therefore be alleged that this is still under its value. But an extension of the principle of valuation on which we have been proceeding will at once show the fallacy of this. If, for example, we calculate the value of farmyard manure according to the prices assumed for guanos, we find that the organic matter is obtained for nothing, and the farmer who is about to use 20 loads of that manure to an acre of his land, may with justice say to the guano merchant, "I am applying to the acre 3 or 4 tons of organic matter, which costs me nothing, and I cannot therefore be expected to pay at the rate of £1 per ton for the couple of cwt. contained in guano; neither can I pay for potash, which, so far as we have been able to see, produces comparatively little effect;" and this at

\* Mr. Nesbit gives no value for potash in his list, and hence it must be supposed does not estimate it in a guano, a system in which I concur, although I have calculated the value both with and without. If we exclude potash and organic matter, Mr. Way's valuation would be reduced to £12 10s. per ton.

once cuts off 18s. per ton from the value. Moreover, it is to be noticed that all the calculations refer to the value of an average sample; but the importers give no guarantee that the guano, as delivered by them, shall come up to this; all that they promise is, that it shall be sound and unadulterated; and should it happen that a cargo contains only one per cent. less of ammonia, phosphates, and alkaline phosphates, its value is diminished by almost exactly £1 per ton, although no reduction is made on its price. Of course, so long as guano could be obtained at £9 or £10, which is clearly quite within its value, this was a matter of no moment, for the purchaser always got value for his money, although he might sometimes have a better bargain than at others. But now that the price is so high, it is only just that a fixed proportion of all its constituents should be guaranteed. I have entered into these details regarding the valuation of guano, because they appear to me to be calculated to some extent to allay the apprehensions now existing among farmers, by showing that the present price of guano cannot possibly be maintained. But this does not in any degree lessen the importance of introducing proper and useful substitutes for it. The subject is one to which I have for some time past paid considerable attention; and long before the present rise in the price I had come to the conclusion that a far too exclusive reliance had been placed in guano. In making these observations I trust I may not be misapprehended, or supposed to wish to depreciate guano, of which I am sure no one who has attended to the opinions I have frequently expressed at the meetings of this society will accuse me. But I feel convinced that guano has frequently been used where other manures would have produced an equally good result at a less cost. Prominent among these stands superphosphate, both because of its results in the field, and because it can be and is manufactured in large quantities. In a recent number of the "Transactions of the Highland Society," I have entered so fully into the composition and valuation of this manure, that it will be unnecessary for me to recur to it here, farther than to point out that a good superphosphate is sold at a price rather under the market value of its constituents. A good sample may contain—

Water .. .. .	16.64
Organic matter .. . . .	12.04
Soluble phosphates .. . . .	20.11
Insoluble phosphates .. . . .	16.51
Sulphate of lime .. . . .	9.15
Sulphuric acid .. . . .	18.52
Alkaline salts .. . . .	2.78
Sand .. . . .	4.27
	<hr/>
	100.00

Ammonia .. . . . 1.55

Estimating according to Mr. Way's plan, this superphosphate would be worth £8 16s. per ton, according to my own, £7 12s., or, with ammonia at its present high market price, £7 16s., and it would probably be sold at £7 10s. Such a superphosphate applied weight for weight, would, I apprehend, produce a result little inferior to Peruvian guano, at not much more than half the price. I believe, however, that all this could be done at a still lower price were farmers to manufacture their own superphosphate—a plan which will sooner or later be adopted. No doubt the impression is general that this process can be most economically effected by a manufacturer, and is not profitable for the farmer; but this is chiefly because the latter has always tried bones, which are both expensive and difficult to dissolve, and never used the most convenient materials, such as bone ash, which would have led him to a different conclusion, as may be easily seen from a very simple calculation. Bone ash containing 75 per cent. of phosphates sells at £6 per ton; but let us take it as costing the farmer £7,

and sulphuric acid of specific gravity 1.7, technically called "pan acid," costs at present £5 6s. per ton, which is unusually high. One ton of this acid and about a quarter of a ton of water would be requisite to dissolve two tons of bone ash, and the product would cost £5 18s. per ton, and contain 46 per cent. of phosphates, at least one-half of which would be soluble, but no ammonia. If the bone ash could be got at £6 per ton, and pan acid at £4 (which is not an unusual case), the superphosphate would cost only £5 10s., while its value estimated in the usual way would not be less than £8 per ton. Ammonia might be added to this substance in the form of sulphate, at a cost of about £1 for every 1.5 per cent.; but whether this would be profitable I am not prepared to state, as it could only be determined experimentally, and there is no matter which under present circumstances it would be more important to submit to careful experiment during the coming summer. Should it turn out that ammonia may be dispensed with, in a manure for turnips, then a most important point will have been established, and there will be every prospect of a diminution in the price of such manures. In fact, the sources from which phosphates can be obtained are undergoing great extension, though perhaps scarcely commensurate with the demand, and hence there has been a material increase in their cost, and in the case of coprolites an unreasonable advance. Within the last few weeks, however, it has been announced that these substances are found in enormous quantities in France, and should this prove correct, there can be little doubt that it will influence prices. They appear to be very similar to those found in England. There is no doubt, then, that superphosphate will be the substance to which farmers will in the first instance have recourse, both because it is well known to produce good results, and to be obtained in large quantity. But then it may happen that the demand exceeds the supply, and in this case there would come to be a rise in price. It will not do, therefore, to rely upon it entirely; and attention must be turned to other substances. Neither must it be forgotten that phosphates, however important, are only one of the elements of plants, and have been found to exert a more important influence on the turnip on particular soils than any other element: in fact, to propose the use of them is only to substitute one manure for another, and not to increase the total quantity of fertilisers at the disposal of the farmer, which is the true and only method in which a permanent depression of prices can be produced, for, as I have already observed, they appear at the present moment to have reached their maximum. The reduction of the price of ammonia and phosphates is in fact the reduction of the price of manures, and it can be effected either by increasing the supplies, or by the better economy of those which we at present have. We have already referred to the discovery of coprolites in France as one mode in which the quantity of phosphates can be increased, and their price in all probability diminished; but I am inclined, on the whole, to give greater weight to the increase and cheapening of ammonia. The great source of ammonia on which we at present rely, is the manufacture of gas; and the cheapest commercial form of a pure ammonia compound is the sulphate. Now, when £17 per ton is paid for that salt, the greater portion of the price goes for the sulphuric acid, which, so far as we know, has no agricultural value, and at all events could be obtained much more cheaply from other sources, and the cost of manufacture. The ammonia liquor of the gas works, after having been once distilled, can be obtained, containing 20 per cent. of ammonia, at a price which gives that substance at from 3d. to 3½d. per pound, or about £28 per ton. The objection to its agricultural use is a very obvious one; the ammonia exists there chiefly as carbonate, and in

that state is peculiarly liable to loss by evaporation into the air, and it is universally admitted that it ought to be fixed by sulphuric acid. It is to be observed, however, that we have no information of a satisfactory kind regarding the loss which the carbonate of ammonia actually does undergo. We know that a certain proportion of the ammonia in Peruvian guano is in that form of combination, but the amount of loss it suffers on that account is not known. It is clear, however, that if concentrated gas liquor were applied to the soil, the farmer could afford to lose one-third of it, and still have his ammonia cheaper than in the state of sulphate. We have at present no data bearing on this point, but it is well known that ammonia runs most risks when applied on the surface, and that if it is incorporated with the soil, it is retained by it. In fact, it is now well known that the very first action of a soil upon a salt of ammonia is to decompose it, to extrude its acid and detain its base; so that we actually manufacture at a large expense a salt which is immediately destroyed again. I would suggest, therefore, as an experiment which may have most important bearings on the economy of manures, the trial of this fluid. I should propose the application at the rate of two to three hundredweight to the acre on grain crops, both alone and mixed with a certain quantity of bone ash, and I would suggest that the land should be made up in ridges, and the solution diluted to a proper extent poured into the bottom of the furrows, while the plough immediately following the application should be made to divide the ridge and cover the ammonia. This I should propose to do several days before sowing, for I apprehend it would not answer to put the seed near the strong ammoniacal fluid, and a few days should be allowed for it to disseminate itself through the soil. I throw this out as a suggestion for the consideration of farmers, and though it is quite possible that this method of application may be too expensive in practice, or that the ammonia may not operate as effectually, it is certainly worthy of trial. One hundred-weight and a half of the ammoniacal fluid, and the same quantity of bone ash, might also be tried on turnips; and should these applications prove successful, it will be possible to make a mixture as good as Peruvian guano, at a cost of not more than £3 per ton. There are many other sources from which nitrogenous matters might be obtained, which are now much neglected, among which I may suggest dead horses and cattle, refuse hair, &c., &c., and last not least urine. It is always a source of regret to me to see the construction of our railway and other urinals, in which a large quantity of ammonia is daily washed into the sewers, where it becomes practically almost useless to agriculture. If in place of using water to wash it away, the smell was prevented by the use of disinfecting powders or charcoal, which would be much more effective than the present method, and the produce collected in tanks, it might then be evaporated with a little sulphuric acid, and would produce a very valuable manure containing a considerable quantity of soluble phosphates and alkaline salts. This process was at one time practised in Glasgow, but was discontinued, chiefly, I believe, because the neighbours threatened to indite it as a nuisance. The material was collected at the different manufactories of the town, and carried to the works in casks; and I believe that, though a price was paid for it, the process was profitable. I have often asked myself whether in a town like Edinburgh, where the levels are suitable, it might not be possible to connect those places by a separate system of pipes, and convey all the produce to a manufactory, where it might be evaporated with sulphuric acid. I cannot help thinking that it might prove successful, for the manure would undoubtedly be worth £8 or £9 per ton. The conversion of fish refuse and coarse fish into a manure is

also deserving attention. There is no doubt that many fish which are unavailable for human food are annually caught on our coasts, which are never brought on shore, but are at once returned to the sea. If those fish were brought to land, cut into thin slices—which could be easily done by the fishermen's families—and then laid out to dry on the stones, after sprinkling with a little salt, the dry mass would be worth about £6 or £7 per ton. All these are matters which merit attention, and should the present crisis lead to any of them being made available to agriculture, its effects will be more beneficial than otherwise. There is one other way in which it will act beneficially, for it will direct more attention to the economy of farm-yard manure, which I believe to be one of the most backward departments of agricultural practice, and which has been kept back, to a great extent, by the cheapness of portable manures. Farm-yard manure, except on the farms of the best agriculturists, is very much what it was a century ago, and there are few who could not introduce improvements. To this day nearly one-half of it is destroyed and wasted by keeping it in a state of active fermentation. Chemists have always strongly opposed this plan. Sir Humphrey Davy did so, in his well-known lectures; and no point advocated by him was more strongly animadverted on by farmers at the time. I have on several occasions referred to this matter at the meetings of the society, and I do so again, under the hope that the subject may now obtain attention, the more especially as Dr. Voelcker has recently shown that the loss is really very great. All these matters to which I have referred must have their effect sooner or later on the price of light manures; but this must not prevent every means being taken to reduce their price: and the agricultural community should urge upon Government the importance of sending out special expeditions in search of guano, nitrate of soda, and all other substances which can be used as manure. And not only that, but rewards should be offered to private discoverers, as at present there is little inducement to any one to search for these substances; for he cannot keep his secret sufficiently long to make a profit of it. A sum of £10,000 would cheaply repay the discovery of a deposit far inferior to Peruvian guano. The production of cheap food is a matter of the highest importance to the welfare of a country, and to do this cheap manures are now indispensable.

Sir J. S. FORBES read the following letter from Mr. Finnie:—

"I regret much it will not be in my power to attend the meeting on Wednesday, as I consider the object of it to be fraught with importance to agriculturists, but more particularly in consequence of a wide-spread alarm which exists (needlessly, in my humble opinion), that the raising of the price of guano by the Messrs. Gibbs, and their restricting the supply of that article, will prove an insurmountable barrier in the solution of the question—How is the land now to be maintained economically and profitably in its wonted state of fertility? Though unable to attend the meeting, however, I have thought it right to jot down some of the views which have occurred to me upon the subject, and now send them to you in case you may consider them to be of any service at the present juncture. It has for some time occurred to me, and I have remarked it on several occasions, that the treatment which agriculturists now experience at the hands of Messrs. Gibbs, is only what was to have been expected. The temptation to overcharge is too great for human nature to forego, and is quite consistent with the history of all monopolies. But the lessons of history also teach us that this is an exhaustive process, because by charging for an article far beyond what it is worth, the latent skill and energy which Necessity, the mother of Invention, has ever in reserve, is called forth into activity, and the result generally has been, that on the one hand the monopolist, if not driven out of the market, has been compelled to lower his prices to the fair value of the article, and on the other, the public has reaped not only the advantage of

the reduced prices, but also of the further discoveries which have been made. I confess, therefore, that although we may suffer a little temporary loss and inconvenience, the farmers will soon come round to see that these gentlemen, unintentionally, perhaps, have proved to be their very best friends. Far be it from me, nor is it necessary, to allege that guano does not stand deservedly high among our lists of portable manures. I would also be the last to maintain that we can effectually keep up the fertility of the soil without supplementing farm-yard manure, and that to a considerable extent, with substances foreign to the farm. But I have as little hesitation in affirming that, to the abuse, and not to the use of guano, is the present crisis in some measure attributable, inasmuch as that substance has unjustly engrossed the attention of the farmer to the exclusion of other portable manures equally as valuable and efficacious; nay, I would say, even to the exclusion of farmyard dung itself. It is not so many years since guano was first introduced into this country, and then sold at £28 per ton. By-and-by, as the supply increased, it fell to £25, but at that price it was apparently to remain, when the late Professor Johnston (not forgetting the invaluable services however of eminent men of the same school, such as Liebig and others) entered the field as our analytic chemist. No sooner did he give forth to the agricultural community a list of substances which by due admixture might be used as a substitute for what was produced from natural sources, while it could be obtained at less than a third of the cost, than all at once the skill of an enlightened public, with all the resources at command, was made available. The refuse of every manufactory became an object of inquiry and importance, and very shortly we were inundated with endless varieties of portable manures, indeed to such an extent as to be far beyond the digestive powers of the United Kingdom. In this race of competition, coupled no doubt with the supplies of inferior guanoes, such as Ichaboe and Chili, the Peruvian guano, with all its vaunted superiority, had to submit to a downward movement, and ultimately succumb to a rate not exceeding £3 per ton. Now, let me ask, are our prospects gloomier than when guano sold at £25 per ton? I venture to reply, we have only to put the same machinery in motion, and results similar to those I have stated will follow; and, certainly, this can be done at present under circumstances much more likely to be attended with permanent and beneficial effects. There are now able and celebrated chemists presiding over every agricultural association at home and abroad. Manufactories, both here and on the continent, are every day increasing and developing additional supplies of refuse, which, in the majority of cases, can all be turned to account, when presented to the agriculturist in a fit state; and numerous are the individuals who, if properly encouraged, would be our foragers and purveyors of what would really be profitable for us to use. We have in London a company producing a manure at £7 10s. per ton, which leaves a handsome profit, manufactured from the blood and bones of the animals killed at the public slaughter-houses—two powerful agents, we must admit; and why may not similar establishments exist throughout the United Kingdom—nay, over the whole of Europe? and surely the supplies from these alone are not likely to diminish, when we consider the growing taste of a daily increasing population for animal food. Have we not, likewise, a country teeming with machinery, which must all be kept in motion with grease and oil? and we know well that, from whatever source these are obtained, there remains a residuum fit and valuable as a manure. In short, it would be tiresome to enumerate the inexhaustible resources patent to agriculture, which only require the aid of science, in combination with self-interest, to turn all to a profitable account, and fit us, without much loss or inconvenience, to dispense with even the Peruvian deposit. No doubt, upon the occasion I have referred to, much was presented to the farmer that led to disappointment; and hence one of the principal reasons why agriculturists have so unreservedly adopted the use of guano, to the almost exclusion of any other portable manure. Our celebrated chemists, however, have not only served to expose, but are now better able, from a more familiar acquaintance with the bearing of science on practical agriculture, to prevent the re-appearance of such trash. It is also true that the reduced price of guano drove out of the market much that was valuable, as the respectable manufacturers and dealers could not successfully compete. It can, therefore, occasion no surprise (one of the conditions of the Messrs. Gibbs being

that no one who obtained a cargo from them should venture to sell any other than Peruvian guano) that, flushed with the idea that the ball was at their feet, and with the irresistible and fatal determination to be too soon rich, and relying too confidently on the passive resistance of farmers, they have, unfortunately for themselves, but luckily for agriculture and the interests of the general community, roused us from our dream of fancied security, and in a way none of us can mistake—viz., by putting their hands into the very bottom of our pockets. But, to make myself more explicit with regard to the observation about the abuse of guano, I may remark that I myself, and perhaps so may others, plead guilty to the charge. In the case of turnips, where no farmyard manure was used, I have applied as much as from 7 to 8 cwt. of guano per Scotch acre; and to potatoes, with a liberal supply of farmyard manure, as much as 6 to 7 cwt. Now I have no hesitation in stating that experience has taught me that it would have been more profitable had I restricted the quantity to 5 cwt. in the one case, and to 4 cwt. in the other; and the benefit would have been even still greater had I employed a mixture of rape, dissolved bones, bone meal, &c., in preference to guano alone, in any of the proportions stated. I have also witnessed in East-Lothian as much as 5 to 6 cwt. applied as a top-dressing to wheat, and I feel perfectly confident that the enterprising tenants in that part of the country will be the first to confess it was a mistake. In various other respects also, guano may be said to be abused, such as (1) in trusting to its agency alone for keeping up the fertility of the weaker description of soils in the country without returning these to pasture during the greater proportion of years, a hope which has always led to disappointment; (2), in supposing the best character of land can be profitably cultivated by reducing much the proportion of farmyard manure and substituting guano instead; and the last and not least important instance of its abuse consists in applying guano alone, to the exclusion of every other portable manure, whereas a mixture would not only have given as good results at first, but have proved more permanent in its beneficial effects. It is a curious fact in practice that the guanoes of an inferior class, when applied weight for weight with the Peruvian, have, upon the most reliable evidence, produced equal results, and that dissolved bones or bone meal have not been found to play a second part upon all land of a lightish description recently broken up from pasture. With these observations, which have extended to a greater length than I anticipated, I draw them to a close by simply expressing the conclusions at which I have arrived as to the mode of extricating ourselves from the apparent difficulty of the guano question. And first I would take leave to say that we, as agriculturists, are certainly bound to approach the legislature and ask for what we are reasonably entitled to, viz., that Government render available all possible means of investigating every source from which a supply of guano can be obtained, even although it should be of second class quality, and surely we may as reasonably expect to be supported in our demand by the general community, seeing that the policy of the Government is in the direction of giving, and the wishes of the people in receiving, cheap and plentiful food. But secondly, as past experience gives us but slight encouragement to place much dependence upon the assistance to be obtained from Government or the Legislature, we should exhaust for ourselves every other available and known source of supply, or, in other words, encourage importers and manufacturers, by making fair trial of such other portable manures as may be brought into market, provided these are certified by the analysis of some well-known chemist. At the same time, we should not forget to turn our attention more than ever to the dung-heap at home, which, I am convinced, by judicious management, may in every case be very much augmented, and which cannot be dispensed with, whether guano be high or low in price. And lastly, instead of employing guano by itself as formerly for turnips and barley on the lighter and weaker description of soils, let farmers use along with it an admixture of some other portable manure, highly charged with phosphates, such as bone meal, dissolved bones, or even guano of a secondary class, if unadulterated, and for turnips and potatoes on the heavier character of soils, employ along with guano some other nitrogenous manure, such as rape dust, blood manure, &c., and while this course will be more profitable, it will tend materially to lessen the demand on the Messrs. Gibbs, and compel them soon to lower their colours and send in a flag of truce."

This terminated the proceedings.

## THE EFFECT OF DRAINAGE UPON PRODUCTION.—HOW FAR IT MAY BE PROFITABLY EXTENDED.

The recent advance in the price of guano is suggestive of more important considerations than those to which we lately alluded, on the importance of the once-despised and ridiculed dung of extinct animals buried in our rocks, for the improvement of the soil. These may be compared with the accumulated masses of the ancient forests of strange and extinct vegetable forms, which once clothed the surface of the earth, and now furnish the coal with which we warm our limbs, and cook our food, and spin our cotton, and are shot from place to place like a sky-rocket, and thrash our corn, and grind it, and drain our land, and are going to plough it no one knows how deep. This advance in the price of guano suggests another important question—the necessity of not wasting it when we have got it; the necessity of not letting quite so much of it, and of other manures, run to waste through our drains. There is moderation in all things, and we ought to take care that in running after every will-o'-the-wisp that haunts undrained land, we do not fall into the evils which arise from over-drained land. The following remarks of a farmer of the old school, now nearly extinct, have some weight in them, and are well worthy of the consideration of some of our most zealous and enthusiastic dreamers, as the remarks of practical men always are: "We slow coaches," said he, "as you need to call us, and laugh at us for letting our muck be exposed to the sun and air, were not so wrong after all. The virtue of muck is in the solid part. Dried muck is like a dried herb: it regains its virtue again as soon as it is wet, like the tea my old woman puts in her teapot. Then, again, we were laughed at, till there was no end of it, because we let the streams of liquid gold, as it was called, run to waste, in the black juice that drains from our muck-heaps. And what do you new lights do? Why just what we did, only you do it in a much more expensive way. We just cut a gap with a spade, and let it off, little by little, into the brook; and it goes off quietly without any fuss. But what do your new scientific farmers do? Why this: the most go-ahead of them drain their land with pipes, laid at I don't know what depth, but at an expense of £5 to £6 an acre, and then lay iron pipes all over their farm at an expense of £4 to £5 an acre more, and put up a steam-engine at an expense of £300 at least. If that is not buying your crops," said he, "I don't know what is. My father bought the land he farmed by farming on the old plan; but your new-fashioned farmers buy their crops, just as the Londoners who come down shooting buy hares and partridges to take home in their game-bags. And then, to prove that all this is right, and that we who have been bred on the land and bred all our lives to farming know nothing about it, you tell us how the drains run liquid-manure, and what a storm it raised among the old women in the next village because it spoiled the water of the brook so that they could not make tea with it. We, I say, not only got rid of our liquid-manure without expense, but without any fuss with the old women, and that was worth something." "Well, but you will say," continued our friend of the old school, "those who go to all this expense in farming are very few: it is not every man that turns all his muck into liquid-manure. I grant that; but those who laugh at all this, and who laugh at us too as being behind the age, what do they do? They put their muck on, its true, in the old way, and they buy

ever so much guano, and they dissolve it in water, and put in the furnips with the liquid-manure drill, and they drain their land five or six feet deep, and all over like a grid-iron; and they tell us it is not enough to get rid of the rain after it has come. Our drains must run to let us know it is coming, like a weather-glass. They tell us, too, we must drain land for the sake of the collateral advantages, whatever they are. They tell us we must set traps to catch the phosphates and ammonia which come from the heavens in the rain. And they set their chemists to analyze the air and the rain, to see how much manure comes in that way; and no two of the chemists can agree how much it is, it comes in such small quantities. A great deal of it comes, too, in the dew; so that is devoured by the crops as fast as it comes, and does not run to waste. But if your chemists cannot find out how much ammonia and phosphates come in the rain, they can tell you how much runs off in the water of your drains, and a fine lot it is. And then you let the foreigners know you cannot do without their guano, and they very naturally raise the price. The slow-coaches, as you called them, who farmed on the good old plan that their fathers and grandfathers used before them, were not so very wrong after all: they did not make drains to get rid of their muck."

Without adopting our friend's views to the full extent, we must candidly confess that there appears something in them. They suggest the reflection whether we may not drain our land too much as well as too little. We were once present at a discussion on these points, between two eminent drainers, which was prolonged to the small hours, when the house adjourned, as some other great houses do, without having come to any decision, except that in which nothing was decided. One authority thought no land could be overdrained; one thought grass land might be. Shortly after this discussion we crossed Romney Marsh. It was late in the summer, after a very cold and backward spring; and it told its tale in the state of the feed, and the stunted condition of the lambs. We observed, however, that in those parts of the marsh where the water of the ditches was not much more than three feet from the surface, there was more feed than where it stood at a lower level.

The remarks above quoted of our old-fashioned friend, and the large quantity of ammonia and phosphates which pass off in the drains, even where the muck is applied in the solid form, suggest some reflections on the manner in which it passes away, and how far these facts are reconcilable with the results of Professor Way's experiments on the fixing of manure by the clay in the soil. On what description of land, we would ask, does the most ammonia and phosphate of lime pass off in the drains? Is it on the sands, the loams, or the clays? If the latter, then the question would be, how far this may arise from the manner in which the rain water passes through the soil into the drains. Does it, as some contend—and they are men of high authority—does it ever filter through the clay, or does it pass into the drains through cracks in the clay? We know how some clays open in hot weather, and before they close they get filled with the more porous soil above; and it is through these cracks, we suspect, that the manure escapes.

This escape of phosphates and ammonia through

drains, and it is quite clear that it is greatest in land the more it is manured—suggests this further reflection, whether we may not economize manure by a more extended rotation of cropping, and by some modification of the Lois Weedon culture, in which the land is made to manure itself by stripes of alternate

crop and fallow. We can remember some old farmers of the common field school, who contended that no good wheat had been grown since we abandoned the system of three crops and a fallow, and took to cross-cropping, as he called it.

## THE ECONOMY OF FARM-YARD MANURE.

Upon a careful investigation, we safely assert that 20 per cent. of ordinary farm-yard manure is wasted. An examination of ten farm-homesteads consecutively taken has fully established this supposition. In six of these the whole of the water from the roofs of the buildings fell directly into the yards. In two instances the buildings were supplied partially with water-shoots, but these were in such imperfect order as to be nearly useless; and in neither of the other two cases did they effectually answer the purpose for which they had been put up. Where the yards were of large dimensions, pools of liquid manure were found standing full to the edge, and which, after becoming filled, ran over into the nearest pond or ditch in a continuous stream of black liquid. No attempt had ever been made to carry it away in that state—no tanks having been formed for its reception.

In most instances sufficient litter was at hand to render the yards tolerably comfortable for the cattle, although in rainy seasons this appeared almost impossible; so that the manure became subjected to continuous wastings for weeks together.

It is too much the fashion to look abroad for improvements, and forget that the first necessity for them exists at home. Year after year passes away regardless of consequences, and thus manure sufficient for the annual supply of the farm is lost once in every five years, and in some instances in a far less space of time. It has ever been thus, and will probably continue to be so, unless tenants can be awakened to the importance of the question; and this, if left to themselves to correct, would probably even then never take place. Whenever this subject has been individually adverted to, the answer is invariably, "My landlord will not do anything." The same observation applies to the improvement of buildings, to drainage, and to every other point of recent introduction. Unless, perhaps, in the case of some few spirited individuals, things remain as they have done, and will probably continue to do so until the expiration of their occupation arrives.

The inquirer will probably ask, How can it be so? whose interest is it to set about this? and why is it not carried out? Here, again, we stumble; the law existing betwixt landlord and tenant is the chief obstacle. It is manifestly the landlord's interest to supply his farm with suitable and properly-constructed buildings, and to see that they are constructed upon the best principle for insuring the economy of the manure. He takes care to restrict his tenant from selling off his farm any of the hay, straw, or roots, when yearly, from the bad construction of the premises alone, as much manure becomes wasted as would be equivalent to what a moiety of the hay, under proper management, would have produced.

If landlords could understand the depreciation that gradually takes place upon farms where little live stock is kept, they might soon be enabled to appreciate this question. Information must be acquired by observing the progressive improvement that follows upon good management, with suitable home-stalls for making the best of the manure. We have seen the pro-

duce doubled, and even trebled in seven years, under good management when due encouragement has been given; and we know of no investment so beneficial to a tenant, as that expended in the erection or improvement of properly-constructed buildings. Covered farmyards may by some be thought too expensive, although undoubtedly the best of all; and where other good buildings exist, they may be judiciously combined with them at a moderate expense. It is stated that on this system Mr. Cook, of Semer, Suffolk, has been most successful. But in absence of such a plan, another may be adopted: sufficient open sheds might be erected and so placed as to render great assistance under the general arrangement for carrying away the water from the buildings, especially when that predominates as the covering. The cost will be found trifling comparatively with the benefit to be derived, and from our experience we know that upon farms of from 200 to 500 acres it might be well executed at from twenty to thirty pounds.

Another obstacle to the proper manufacture of manure is the great extent of the yards. Wherever this is the case they should be reduced, by the erection of fences to a proper size, and be so divided as to be available for each kind of stock. Where placed upon a regularly-inclined plane surface, fences with brick foundations should be put up, and the soil raised at one part and lowered at another, so as to bring them upon a level, or as near thereto as can possibly be effected. Of all descriptions of farmyards, those having an abrupt inclination in one direction are the worst to deal with, and are more subject to losses from the effects of heavy rains than those of any other description. Although not easily remedied, by carefully disposing the walls and placing tanks in proper positions, little loss need be sustained; and, indeed, in almost every case that has come under our notice we have found that from £50 to £100 judiciously laid out will effect a great deal, and in most instances all that is required.

Why this is not carried out may be readily answered. Each party, as landlord and tenant, imagines that it is the place of the other to put it into execution; and thus, partly from obstinacy and partly to save themselves the expense, it is never performed. It would be, however, very reasonable for a landlord to say to his tenant, "I perceive that your manure is annually wasted, to the great injury of yourself and my farm, and to prevent which I am willing to meet you in the expense of the improvement." Or, if in a position to take all the outlay upon himself, he might make the improvement, and charge six per cent. by way of increased rent, and this he might invariably venture to do whenever the farm changed tenants.

The question is too important to be lost sight of; and we hope that these remarks may keep the question prominently before our readers. As we have already stated, the amount of good would be immense, whilst under the most disadvantageous circumstances the outlay necessary to obtain it would be trifling in proportion with the benefit to be derived.

## AGRICULTURAL CHEMISTRY.

BY J. C. NESBIT, ESQ., F.G.S., &amp;c.

A lecture on "General Agricultural Chemistry" was delivered at Truro, on Wednesday evening, the 19th Nov., by Mr. J. C. Nesbit, F.G.S., F.C.S., &c., Principal of the Agricultural and Chemical College, Kennington. The lecture was given in pursuance of an advertisement from the Probus Farmers' Club; and it was attended by a numerous and respectable company, principally agriculturists. The chair was taken by Humphry Willyams, Esq., a county magistrate and landowner.

The CHAIRMAN, in introducing the lecturer, spoke of him as one who had throughout life devoted his talents to the benefit of the agricultural interest, and who, having been lately visiting Cornwall for the benefit of his health, had been studying its soils, and their capability of improvement. The Chairman then made some general remarks on the condition of agriculture in Cornwall, and on the energy and ability of the Cornish farmers. He referred to Mr. Nesbit as the principal of one of the first agricultural colleges in England, and expressed his regret that there was no agricultural college in Cornwall. A large sum of money, called the "Rodd Testimonial Fund," was collected some years ago, for the express purpose of establishing such a college, which sum of money was now lying dormant, and from which the agricultural interest was deriving little or no benefit. He took the opportunity of recalling that circumstance to mind; for it was a matter in which he felt a deep interest, and he was convinced that no measure would be more beneficial to the county at large than the carrying out the original intention to establish an agricultural college in Cornwall.

Mr. NESBIT then said: Mr. Chairman and gentlemen,—I assure you it gives me very considerable satisfaction to appear before you in Truro, to endeavour briefly to elucidate some of the principles of the applications of science to agriculture. You must all be aware that in one single lecture it is scarcely possible to do more than to select from one or more of the different branches of agricultural chemistry a few of those which may strike me as being most important, or most applicable to the condition of agriculture in this county. I shall, therefore, have to omit a very considerable portion of this important science, and to select only certain portions of it which I think more immediately relate to the subject-matter I have in hand, and are adapted to this county; and to those subjects, therefore, I shall chiefly confine my attention. But, before I enter on the farming, or the real practical part of the subject, allow me to enter a little on the chemical part. I am rather diffident, before an audience like this, composed chiefly of those engaged practically in agriculture, of intruding my chemistry on them. I shall do it as

shortly as possible, and only use such experiments as will illustrate the properties of those substances which plants accumulate to themselves, either from the air, or the soil, or the water with which they are continually bedewed. The first thing I have to say, in entering on this subject, is this: If you take any plant whatever, and burn it, you effect at once a kind of solution of that plant into two different series or kinds of ingredients or elements. The plant has its roots in the soil, its leaves in the air. Both have the power of abstracting, in their respective positions, materials for the service of the plant. The roots take certain matters from the soil, the leaves from the air; and the water which comes down from the air is both absorbed by the leaves and the roots, and given out by the leaves under certain conditions. If you burn a plant—for example, wheat, straw, wood, or any form of vegetable matter—that which goes back again into the air, and disperses, is that which originally came from the air; that which is left behind in the form of ash, is that which was originally derived from the soil. The one may be called the earthy or mineral matter of plants: the other the æriform or gaseous constituents of plants. But we have other terms for them: we call the earthy or mineral, inorganic; and those which are driven off by heat into the air are generally called the organic constituents. The mineral constituents consist of a great number of things which are common to most soils. We have silica, often in the form of sand; we have lime, magnesia, potash (which is the substance which gives a soapy feel to ley from wood-ashes); we have soda, the basis of common salt; phosphate of lime, which must be known to every one in the room as the earth of bones, and which is essential to plants on which animals live, or the animals could not obtain phosphate of lime for the bone structure of their bodies; we have a little sulphuric acid, and a little muriatic acid, which are found in soils and also in plants; and besides these, we have alumina and one or two other substances, which are found in soils, but which do not appear to take any part in the constitution of plants. Leaving these mineral constituents for the present, premising that you must have these before plants can derive materials from the air, I shall now confine my attention to those materials which they take from the air—the æriform, or organic. These substances are only four. Three of them are gases; and the fourth, though it exists in the air in the gaseous form, is a solid body in its natural or uncombined condition. The first is called oxygen—a constituent of water and of air. The next is hydrogen, found in common gas, in fatty matters, and in almost everything you see burn with a blaze. Nitrogen is the next body, which has its name from being found in nitre, or salt petre, and is a substance present in most fulmina-

ting or explosive compounds. And then we have the fourth, called carbon, or charcoal, which in its purest form exists as the diamond, and is also well known in its ordinary form of common charcoal: the substance called black-lead is not lead, but simply another form of charcoal. Carbon is also found in a combined state in all chalk and limestone rocks, which contain a substance called carbonic acid, formed by the union of carbon with oxygen. Carbonic acid is found in the air; and it is from this source that plants derive their carbon or charcoal. I shall just endeavour to illustrate the properties of these substances. [Mr. Nesbit here performed a number of chemical experiments, to show the properties of the four organic substances. He remarked that nitrogen is the basis of all animal muscle, and is found in large quantities in all the seeds of plants, because they are destined to feed animals, which require its presence to a large extent.] After these experiments, Mr. Nesbit said:—I have had the pleasure of illustrating to you some of the properties of the four organic bodies of which vegetables consist:—the oxygen, that which burns all things; the hydrogen, that which is burnt, and produces water when so burnt; the carbon, which when burnt produces this carbonic acid you have seen exhibit so many properties; and the nitrogen, which is the distinguishing element of animal muscle, and must be found in vegetable matter destined for the food of animals. Some persons might no doubt be surprised if they were told that the vegetables grown on the land do not derive the greater part of their nutriment from the land; they derive on an average nine-tenths of their weight from the air. Therefore, gentlemen, if any of you have been in the habit of thinking that your plants derive the whole or the main portion of their nutriment from the land, you have been quite mistaken. There is only a very small portion, that which is inorganic, derived from the land in the natural way; the rest comes from the air. How does it come from the air? You may have all in the land which it is destined to furnish, and all in the air which the plant requires; but you want a power exterior to the plant to enable it to act upon these materials. There is an emanation from the sun—a power, a force, no matter what you choose to call it, whether magnetism, electricity, heat, light, or whatever it is—there is a force and power which emanates from the sun; and it is this, acting on the leaves of vegetables, which enables those vegetables to absorb and appropriate the various substances I have mentioned. The ordinary vegetable sends its rootlets downwards, and its leaves upwards. The roots collect from the soil the inorganic matters, the phosphates, the potash, the soda, the lime, the magnesia, the silica, &c. The leaves are sent into the air. The sap, which rises from the root, has dissolved in it the mineral matters, and its aqueous portion is of course composed of oxygen and hydrogen. In many instances plants form products consisting solely of hydrogen and carbon, the corresponding amount of oxygen previously combined being wholly eliminated. This giving back of oxygen to the air is very curious, for you see the vital oxygen of the air is that without which man and other animals cannot live. The vegetables give back the oxygen, and we consume it: we give out the carbon from our system, and they consume it; and thus, by this beautiful alternation, plants and animals provide for each other. [The lecturer here mentioned an experiment by a French philosopher, proving the powerful influence of sunlight on plants, and that the branch of a living vine had no power to abstract carbonic acid from the air in the dark, but took the whole of it in the sunlight.] Plant forest trees in any part of Cornwall where, if not too much exposed to the N.W. wind, they will grow; you will find that year after year, through the falling of the leaves and the growth of the

roots, you will get an accumulation of vegetable matter in the soil. At the end of thirty, forty, or fifty years, you will be able to remove hundreds of loads of timber, and yet the soil will be then much richer in vegetable matter than before. It is evident that the vegetable matter must have come from the air, as it did not previously exist in the soil. Now, let me conclude this part of the subject by saying, that the carbon, the hydrogen, the nitrogen, and the oxygen, the four organic materials, plants primarily derive from the air; and it is to the air we must look for these substances. With your permission we will now turn our attention to the consideration of the properties of that important substance, farm-yard dung. Let us see if we can trace its properties, what it is, and where it comes from; and whilst we give to dung made on the farm its true and proper value, let us not over-estimate its value. I must mention, that in entering on the subject of farm-yard dung I have passed over a great and important point, which time will not permit me to touch upon, which ought to be the subject of a distinct lecture—soils. But returning to farm-yard dung: how is it made? I hardly like to speak very much of the mode in which it is made in Cornwall; but if it be true that gentlemen are in the habit here of taking straw and putting it on the roads, and allowing horses and carts to go over it, allowing it to get thoroughly wet with the rain of heaven, so that everything soluble in it is washed out—that is one way of making something which may here be called a manure, but what it might be, if analyzed, I am rather fearful of saying (laughter). We find that everything volatile in it is gone into the air, and everything soluble is gone into the water, and what is of least worth is left behind. In making farm-yard dung, you take vegetable matter and try to decompose it; but let us see if we cannot decompose it with less loss than by this primitive Cornish system. Some gentlemen will tell you that by passing all the straw they have through the stomachs of their animals, all that can be digested will go to form beef or mutton, and that which cannot will be thrown out, and be useful for growing turnips or some other plants. But what I want to explain to you is this: that whether vegetable matter goes through the body of an animal, or is rotted on the roads, provided you don't let anything go into the air or into the water, if you save all the produce you get, you will have the same ultimate results of decomposition from the same materials. If you give a bullock or sheep a certain amount of hay, that animal chews the hay and passes it into the stomach, where a certain portion is made use of and consumed for the purpose of affording animal heat; another portion, not wanted for animal heat, is rendered soluble and laid on in the form of fat or flesh; and another portion, which it cannot assimilate, is cast out by the animal. Exactly in the same way, if you take a quantity of vegetable matter, and let it be moist and put together in a heap, the oxygen of the air acts upon it, dissolves, burns a portion of the hydrogen out; dissolves also a portion of the carbon; gives out heat; and you get precisely the same kind of ultimate decomposition in this case as when vegetable matter is decomposed in the air. The only difference is, that in the animal economy a more lengthened series of decomposition goes on, whereas in the air the series is not so lengthened: the ultimate products are the same in both. What you call farm-yard dung is merely the refuse vegetable matter rejected by animals, combined with other vegetable matter which has been decomposed in the air; the materials which once took part in the formation of vegetable life are prepared again to take part in the production of subsequent vegetable life. Your farm-yard dung is merely a form of once-existing vegetable life, decomposed and put into the land to reappear in another form of vegetable life. As to the strength of the constituents, the



power of your farm-yard dung, it depends altogether upon the kind of vegetable matter you decompose. If you decompose straw, the dung will be of corresponding value; if you decompose oilcake, the dung will also be correspondent to its value. Which do you consider of most agricultural value in a plant, the straw or the grain?—say of wheat or barley. We find by analysis that the seeds of plants contain a larger amount of nitrogen and phosphates than the stalk. When you use the seeds of any plant for the purpose of feeding, the dung of the animals has an increased amount of nitrogen and phosphates; and this is precisely what the plants want, because they want ultimately to produce seed. If you give a growing animal oilcake, the dung will not be so good as if you give the same amount to a nearly fattened animal; because a young growing animal will abstract a larger amount of the phosphates to form bones, and of nitrogen to form muscle. You all know that the dung of animals in a nearly fat state is much richer than the dung of young stock. In the same way, the dung of milch cows will be much less valuable than that of fat stock, because of the phosphates and nitrogen required to form the milk. You may take it as a general rule that the nature and value of the dung will be relative to the nature and value of the vegetable matter from which it was produced, whether this matter was decomposed by passing through an animal, or in any other way. In decomposing vegetable matter, some constituents are soluble, some insoluble, and some volatile. It is a general rule in this world that those things which are most valuable are the most difficult to keep; while those of inferior value may belong to us without envy for any length of time. The nitrogen, which may be considered the most valuable of vegetable matters, is the one which most easily escapes; as on the decomposition of substances which contain it, ammonia, a volatile compound of nitrogen, is produced, and without care may easily escape. The materials of next value to those which escape into the air, are those soluble in water; including potash, soda, some phosphates, and all the nitrogen which in some of its combinations has not been rendered volatile. If you allow too large an access of water to your decomposing matter, all these will be washed away and go to enrich the vegetation of the ocean, which I believe is not necessary to be done as a private speculation (laughter). The plan of mixing lime with manure cannot, I think, be very clearly laid down as one that ought to be advised. Lime is a great antagonist of ammonia, and if you were to mix any substance containing ammonia with lime, the lime would unite with the substance previously combined with the ammonia, and would set the ammonia free. To show you that it is not advisable, under ordinary circumstances, to mix lime with dung or any valuable manure containing ammonia, I will show the effect of mixing some lime with guano. If the farm-yard dung is made in what is said to be the Cornish fashion (I must beg pardon, I am only presuming on hearsay), namely, of washing the best part of the soluble matters out of the straw in highways and byeways, I suppose that putting lime to what is left would do little harm. But I will show you what would be the effect of adding lime to a valuable manure, one that does contain ammonia, something which ought not either to be rendered volatile, or to be washed away. I will put some lime to this guano, and you will find, the instant they get together, we shall have an undoubted evolution of ammonia. [The lecturer here mixed some on a plate, and it was handed to his audience, who, on smelling it, gave visible evidence of the effects of ammonia.]

The CHAIRMAN—In proportion to the loss of ammonia, is the deterioration of manure, is it not?

Mr. NESBIT assented.—We have now seen, he said, that what is called farm-yard manure is simply vegetable

matter, something which has formed vegetable life; and we have seen that the seeds which when fed by animals produced the very best manure, are those which contain the very largest amount of nitrogen and phosphates, which at the present time are substances of the greatest proportionable value. Now as to the making your farm-yard dung, it is quite clear the more your animals consume of seeds, such as oilcake, barley, &c., the greater amount of valuable manure you will have of your own raising; and it is quite material that you should keep it free from the rain and wet. There cannot be a better plan, when you have a collection of farm-yard manure, than either to get it into the land at once, or if that be not at the time practicable to mix it with layers of earthy matter. A bed of earthy matter should form the basis, such as road-scrappings, ditch-stuff, or in lieu of these the common soil of the field; then eighteen inches or two feet of the farm dung; then four or five inches more of earthy matter; then more dung; then earthy matter again, and so on, finishing the heap with a coating of six or eight inches deep of earthy mud on the top. I don't advise you to put lime; because if your manure is of any particular value, it will tend to drive off that portion which consists of ammonia. But I advise you to use earthy matter, and by turning it over once or twice, and again covering it over on the top, you will eventually get a compost of considerable value; I am speaking of such times as when you cannot carry the manure on to the land at once. As far as the use of lime is concerned, it is better to make the lime itself into a compost with earthy matter, or even such refuse vegetable matter as stroil (couch grass) or other weeds, and continually turn it till its caustic nature is rendered mild. After this treatment it may be used with layers of common earth between the layers of dung. I think we have now seen pretty clearly that our farm-yard dung, the great staple of all, is really derived from the air and the soil by previous vegetables. We may consider that, therefore, as a point proved. Now let us go to another and a very important thing, the rotation of crops. In entering on this subject you will allow me to point out, that, whatever is said to the contrary, farming is really, to a great extent, an artificial process. Your farms are manufactories of grain and other special vegetable products. If you leave it to Nature, she will clothe your Cornish hills and valleys with those common and indigenous plants which are most adapted to the soil. She will put one form of verdure on one hill, and another on another; will take particular notice of all the variations of climate which your townsman, Mr. Whitley, is so happily and properly pursuing; she will clothe them exactly with the vegetables suited to each particular nook and corner, height and depth, or degree of moisture and dryness. These plants, however, are not suited for our purposes. We have to grow those which would not grow naturally, because we have to provide for our own sustenance, and are obliged as well to pay our rent, and the taxes necessary for the maintenance of the commonwealth; therefore, it is a point of the greatest importance that we should grow the plants best adapted for these purposes. In the first place, we all know that we require the staff of life; we require cereal plants, wheat, barley, oats, &c. If we refer to the various systems of the rotation of crops, we shall find that their ultimate object is to keep a large quantity of stock, and at the same time to produce the cereal crops, both of which are necessary for the sustenance of man, and, as products of the farm, have the highest value. Now, different plants having a different expanse of foliage, are not endowed with equal powers of obtaining nutriment from the air. Some present very small leaves to the air, others very large; some, again, have not very large leaves, but still present an abundant amount of foliage, and, whenever the sun

acts, present a large and broad foliage to the action of the heat and light of the sun. Now you will find the rotation of crops, if properly looked at, will practically resolve itself into this: it is to make use of some plants of abundant foliage to abstract from the air, for the use of other plants, organic matter which the latter have not the power to obtain from the same source in quantities sufficient to produce the crops which in an artificial state of cultivation the farmer requires. If you take as the most simple form of our rotation of crops, the four-course or Norfolk system, turnips, barley, clover or seeds, and wheat; you will find the germ or principle of all the rotations in that one. The turnip, the first of the series, is a broad-leaved plant, and presents a large amount of leaves to the air. The turnip sends into the air these broad leaves, and derives therefrom a large amount of organic matter, carbon, nitrogen, hydrogen, and oxygen. The roots penetrating into the land absorb thence inorganic matters; the two are together accumulated in the bulb of the turnip; and if it were not disturbed, the turnip would make use of the substances it has accumulated in the bulb for producing seed. But you do not desire the turnip-seed, but rather to produce beef or mutton, together with some barley, for the purpose of obtaining a greater money value. The turnips are eaten by animals, and produce a certain amount of beef and mutton; and that which the animal gives forth in its excrement is used for growing your next crop of barley, whether it is deposited on the land by folding sheep, or has been voided in the farm-yard, and subsequently carried on the land. By this means the barley, which naturally might only produce a quarter and a half, or two quarters per acre, is enabled by the materials it receives from the turnips, and which are taken up by its roots, to produce four or five quarters, or even more, per acre. I come next to the clover, which follows the barley; this, like the turnip, is not a plant of broad leaves, but still produces great foliage, and every leaflet that shoots up into the air sends a rootlet downwards. In proportion to the growth of the leaflet upwards is the development of the rootlet downwards; and if you allow the full development of the leaves upwards, you will have a corresponding development of the roots downwards. If you then cut the clover, say at Midsummer, and remove the crop of hay, allow the plant to develop again, and cut and remove another crop in September, you will have enabled the plant to develop the largest possible amount of roots. These roots it is which, by their decomposition in the soil, furnish the additional amount of organic matter for the wheat plant, which enables it to produce a larger amount of wheat per acre than it could, possessing as it does narrow leaves, have otherwise obtained from the air. So that the clover provides for the wheat as the turnip does for the barley—turnips, barley, clover, wheat. Except in some particular classes of soils, which require the mechanical action of treading, and which are rendered too porous by the large development of clover roots, you will find that the plan of cutting and removing the crops of clover hay will give a better crop of wheat than if the clover was fed off by sheep or other stock. This is because, if you send in your sheep, every leaf they eat off destroys the development of the root with which it was connected, and consequently diminishes the amount of vegetable matter that the roots would otherwise accumulate in the soil. I will give you an instance of an experiment made. A friend of mine had a field of clover, and he cut it all at Midsummer, and took a very full crop; subsequently he turned his sheep on one-half of the field, and the other half he allowed to grow, and cut it again in September. He dug up then equal portions of each part of the field. Where he had cut once, and subsequently fed, there was 35 cwt. of dry clover roots to the acre; where he had cut twice, there was 75 cwt.

per acre, giving a clear advantage to the latter practice of two tons of vegetable matter per acre in favour of the next wheat crop, which was decidedly the best where the two crops of hay had been removed. This is one mode of providing organic matters for those crops which pay best, and of which you want to grow the largest amount. Another mode is by ploughing-in the green crops. When stock fetches such a high price as it does now, and the conversion of lean into fat stock is attended with a profit, the ploughing-in of the green crops would not, of course, be followed. But I remember the time, only about ten years ago, when turnips were so plentiful that farmers offered £2 per acre to their neighbours possessed of sheep to send in their flocks to feed the turnips off; and I knew that refused. I happened to be lecturing in Berkshire on this subject in the spring of 1846, when, in consequence of the dearth of food in 1845, a great quantity of the lean stock had been sold, and in 1846 there were none to be got. There was a very abundant crop of turnips, and the gentlemen about that neighbourhood did not know what to do with them. I said in my lecture to them, "I think your remedy is perfectly clear. If you set a flock of sheep on these turnips, the sheep will do nothing but eat a portion and take it away, and deposit the rest on the land; therefore, if you chop up your turnips and plough them into the land, you will have more manuring matter in the land than if you give them to your sheep, unless you give your sheep oilcake or other artificial food." The experiment was tried over a large breadth of land in that district, and next year they had a better crop of barley than ever they had before, better than those of their neighbours whose turnips had been fed off by sheep. You must recollect that animals do not make manure; they always abstract for the purposes of their growth a portion of the vegetable matter upon which they feed; that only which is deposited is left behind as manure; therefore, any vegetable matter passing through an animal always loses a portion of its manuring value. Speaking on this subject, allow me now to refer to the rotation of crops in Cornwall. I expect on this point to see some opposition of opinion; I am going to find fault, and I am going to suggest improvements. I may be in the wrong, but I am open to conviction, as I hope you are. It is for me to speak what I think, and to suggest what may probably be for your advantage. I find you are very much in the habit here of taking two corn crops in succession, and very much in the habit of laying down grasses for two or three years. I have no doubt whatever that this practice arose in former times from necessity. I, for my part, have a very great opinion of the great wisdom of our ancestors; I really believe, if they had not been very wise men themselves, they could never have produced such a generation as the present (cheers and laughter). I therefore believe the operations of farming as practised in Cornwall at the present day were at one time suggested by absolute necessity; and what I want to point out is, my belief at the present moment, that the very same system which is now practised, and formerly rightly practised, is not rightly practised at the present day, the necessity having passed away. If I read your system aright, you lock up your lands in clover and grasses for three years. I don't believe, when this system originated, you had clover, but that you were necessitated to lay down land to grass three years, to accumulate a certain amount of vegetable matter in the soil, to get a crop of wheat out of it, and that was your only means of doing it. I know some of the Wiltshire downs were more badly situated than the lands of Cornwall; they had to lay down grass for twenty years, they then got one solitary crop of corn, and then the land was nineteen or twenty years in ley before another crop. You see all this is only telling the same

talé; and it is, that the farms generally in Cornwall and Wiltshire formerly were not capable of producing enough manures for the full development of their powers. The soil was better adapted for growing than there were facilities for getting manure; you had then no means of getting extraneous manures, and therefore required three years or twenty in grass to get conditions for a crop of corn. Do those conditions exist now? When lecturing in Wiltshire eight or nine years ago, and pointing out the immense importance of artificial manures generally, I said that their chalk downs, letting at half-a-crown an acre, (whilst down in the bottoms there was land paying £4 an acre,) would in a very little time come into cultivation. I said, "Do you not see you can carry up in one waggon enough manure for twenty acres? and you will then get your swedes, your barley, your clover, your wheat; by carrying manures for swedes you will ensure a series of crops for four years." Now do you not see in Cornwall that you are similarly situated? that you are not dependent—ought not to be dependent, on three-course leys? for I am perfectly persuaded that by a proper system of extraneous manuring you would be enabled to get as much in one year from your clovers as you do now in three years. I was rather surprised to see this system in Cornwall; and I am still more astonished to find that our good, but indispensable, friends the lawyers, by copying old leases year after year, and never stretching their inventive faculties to the length of adapting leases to the present time, are compelling and continuing this system. I do feelingly appeal to our indispensable friends; and I ask all connected with the working of leases and lands to represent that this is not the time for restrictions of that kind—(cheers)—and that we ought to have them wholly removed. By the use of a proper amount of artificial manure you can change the agricultural rotation of this county completely; and I have no doubt, if I live to come down here in five years' time, if what I am now suggesting be carried out to a proper extent, that I shall receive a very different account of the productive powers of the county. I will suggest a change in your course of cropping; I will not say it is a right one, but I offer it as a suggestion to be commented on and spoken of by you, gentlemen, when you like. Suppose we take a course of this kind:—Turnips—barley—clover and seeds—wheat—turnips—barley—mangel wurzel in lieu of clover (as lands will not always bear clover every four years)—and then wheat. On the clover and seeds I should put the farmyard dung in the autumn after the barley, instead of putting it upon the wheat in the subsequent year, and, if necessary, would assist the wheat with guano or some similar nitrogenous manure. I believe our young clover and young seeds are much injured by sending in the sheep immediately in autumn, when the plant requires to be acclimatised and strengthened for its exposure to the approaching winter weather. I would put on the manure at that time, because I am satisfied that when spread on the land it would not only be a covering to the young plant from the cold, but would materially assist, by its manuring, in its full and proper development; and the benefit will be seen in getting an earlier production of the clover in the spring, than you do now. After the clover I would take wheat, then turnips, and by a proper system of horse-hoeing the wheat to get rid of the weeds, I believe it is quite possible, in this county and climate, to take a green crop, such as Italian rye-grass, after the wheat before the next crop of turnips. I would take my turnips, then barley, and then in lieu of seeds mangel wurzel, with a good supply of artificial manure, and then the land would be prepared for a subsequent crop of wheat. You will see this would be a much better and more profitable course of cropping, with a proper amount of extraneous manures, than your present

system of laying down to grass; when, if your grass fails in the first year, you are obliged by your leases to keep it for two years without anything on it. I must now refer to another clause contained in your leases. I find our indispensable friends have not confined their attention to dictating to farmers the exact rotation of crops; for I understand you are all obliged to carry so much lime or shell-sand every year. A great many leases say you must lime your land, whether it is required or not. I attribute all this simply to the fact that in former times lime was found useful, as well as the laying down the land to grass for three years. What I regret is, that the ingenuity of our favourite friends has not been exercised in altering these leases, and adapting them to the improved state of agriculture. I know this liming has been a vexed question for a long time in Cornwall. One class has said lime is the very best thing in the world; another has said it is no use at all. When I heard of this question being debated, it struck me that probably both parties were right, and that they had been quarrelling about words without any meaning, each thinking of his own particular case, and not of his neighbour's. Mr. Olver, of Trescow, I believe, is one of the great advocates for the non-use of lime. I asked him to be so good as to give me samples of his soil and subsoil; and through the kindness of Mr. Pollard, I got some of the shell-sand slime from Wadebridge; and through the kindness of Mr. Bryant, I got some of the Rock-hill and Perlees Bay sand, from the vicinity of Padstow. I have analyzed the whole, and the results you will see from the analyses I now exhibit:—

FROM TRESCOW, NEAR BODMIN.

	Soil.	Subsoil.
Moisture .....	3.05	1.67
Organic matter .....	6.63	4.89
Silicious matter .....	73.73	80.47
Oxide of iron .....	10.18	7.93
Alumina .....	3.09	4.00
Phosphate of lime .....	0.22	0.08
Hydrated sulph. of lime .....	0.26	—
Carbonate of lime .....	1.62	0.36
Chloride of Sodium.....	0.02	0.03
Magnesia.....	1.15	1.17
	100.00	100.00
Nitrogen, (equal to) ...	0.33	0.15
Ammonia.....	0.40	0.19

DEPOSIT OF SLIME, WEYBRIDGE.

	Per cent.
Moisture.....	13.32
Organic matter .....	4.66
Silicious matter .....	52.35
Oxide of iron.....	2.98
Alumina.....	2.24
Phosphate of lime.....	0.17
Hydrated sulphate of lime .....	0.79
Carbonate of lime.....	21.10
"          magnesia.....	0.90
Chloride of sodium .....	0.77
Magnesia .....	0.72
	100.00
Nitrogen (equal to)..	0.15
Ammonia .....	0.19

ROCK HILL SAND, PADSTOW.

Moisture.....	0.52
Organic matter, &c. ....	5.45
Silica (sand) .....	20.80
Oxide of iron and alumina .....	2.20
Phosphate of lime.....	1.01
Chloride of sodium .....	0.02
Carbonate of lime, &c.....	70.00
	100.00
Nitrogen (equal to) .....	a trace
Ammonia .....	—

PERLEES BAY SAND, PADSTOW.	Per cent.
Moisture.....	0.52
Organic matter, &c.....	5.48
Silica (sand).....	10.00
Oxide of iron and alumina.....	1.41
Phosphate of lime.....	0.26
Chlorium of sodium.....	0.23
Carbonate of lime, &c.....	82.10
	100.00
Nitrogen (equal to).....	a trace
Ammonia.....	—

Allow me to direct your attention to the soil and subsoil of Trescow [the lecturer here pointed to the diagram]. You see, without reference to other materials, that there is a certain amount of carbonate of lime in the soil, 1.62 per cent.; in the subsoil only 0.36. Then if we look to these shell sands, we find in the slime at Wadebridge 21.10 per cent. of carbonate of lime; in the Rock-hill sand, 70 per cent.; and in the sand from Perlees Bay, Padstow, there is 82.10 per cent. It is to this carbonate of lime we must chiefly look as the efficient ingredients in these substances. You will see that Mr. Olver, or his predecessors, have raised the natural condition of the land at Trescow from 0.36 of carbonate of lime in the subsoil to 1.62 per cent. in the soil; and when I took the simple slaty matter of the subsoil by itself, and crushed it to pieces and analyzed it, that contained less still; so that the decimal of 0.36 of carbonate of lime in the subsoil at Trescow merely arose from the finer portions in the upper soil being washed down. Now when you have getting on to two per cent. of lime in the soil, you have what I have generally found, practically, to be an available amount of carbonate of lime in such soils. So that it is perfectly clear in Mr. Olver's case, that he or his predecessors have already carried enough lime on that land to satisfy the present conditions of the soil for the plants; and that any provisions in leases, or in any other way compelling Mr. Olver, or any other farmer similarly situated, to cart more lime instead of guano or superphosphate of lime, or similar manures, would cause an improper expenditure of money. Another thing of importance in the Wadebridge district is this slime [pointing to a diagram], which contains 52.35 per cent. of silicious matter perfectly insoluble, and it also contains 21.10 per cent. of carbonate of lime. If you got that for nothing, and had the expense of carting it to any considerable distance, four loads of that would produce the same effect as one load of the Perlees Bay sand. So that I think, with those analyses before them, the gentlemen of the neighbourhood of Wadebridge will hesitate before they carry on their lands deposits of slime; they will rather take the Rock-hill sand, containing 70 per cent., or the sand from Perlees, or other similar bays, which contain at least 82 per cent. of carbonate of lime. This question of liming is no doubt one of great importance. You must recollect I am not advocating that there should be no lime applied. I am perfectly satisfied that the whole of the western districts of England require lime. In Exmoor, some years ago, I analyzed some specimens of the soils and subsoils of Mr. Knight, when he was about taking that land in, and which has come under the direction of Mr. Smith, the present intelligent and active steward there. I wrote him to say, that after my analyses, though they might pare and burn it, and use guano, superphosphate, or any other artificial manures, yet if they did not use lime they could not get a crop. Curiously enough, that was proved by accident: in liming a twenty-acre field, which had been pared and burnt, they had not quite enough lime to finish the field, and about an acre was left undressed. The field was prepared by guano broadcast, and superphosphate of lime was

drilled with the seed throughout the whole field. I saw that field in the autumn, and where the lime had been put there was a magnificent crop of turnips; but although on the remaining portion of the field there was guano and superphosphate of lime and burnt ashes, there was not a turnip where no lime had been applied. You must not take any expression of mine as telling you that you must use no lime. The western districts cannot do without lime; but I have no doubt that many soils having had lime or shell-sand carried for a series of years have enough to last for a long period without any additional quantity; and, therefore, it is advisable that landlord and tenant should come to an agreement to allow, under proper circumstances, its disuse, and instead, use guano, superphosphate, or other manures. I am almost afraid I am occupying too much of your time ("Go on"). The next subject, and the last I have to refer to, is artificial manure. Now as it is perfectly clear you do not, and cannot, produce on your own farms enough manure for the efficient carrying on of farming, it is very important to know where you can get a supply from without, and what is best adapted for your crops. You are quite aware of the advent into England of that imported birds' dung called "guano," which has been productive of very considerable effect, and which came in when protection was taken away; it was curious that this guano should then come in to supply your real wants, and that the gold discovered in Australia eased the money market; so that, in fact, you have not been quite so impoverished when unprotected as some of you thought you should be. Guano has been no doubt a great boon to this country, for we have had from it almost the whole supply of nitrogenous matters requisite to give increased produce, and it must have increased the produce of our lands by many millions of quarters of corn. In the present year, the last season, 210,000 tons of guano were sold in this country, and probably the farmer did not pay a less amount than £12 10s. per ton, which approaches to two-and-a-half or three millions of money. That is a very large sum for the farmers to lay out, but it has been laid out profitably; for you cannot suppose that the farmers who have laid out two-and-a-half or three millions of money, have gained less by that than one-and-a-half millions. That is allowing them only a very small profit; for we have it laid down, by experiments which have come under my own observations besides those of Mr. Caird and others, that an expenditure of 2 cwt. of guano almost in all cases ensures a produce of a quarter of corn. It was a very fortunate thing that we had guano coming in, and equally important that mineral treasures of phosphate of lime have been discovered in our own country. It is well known, by the investigations of Professor Henslow and others, including those made by myself, that we have millions of tons of phosphate of lime existing in a mineral state in the eastern part of the kingdom; and Liebig has suggested the means of dissolving these fossil phosphates by sulphuric acid. Thus we have a manure of our own manufacture, which, as far as turnips go, produces marvellous results. Now, I wish again to point out that those materials we find in the seeds of plants, in the shape of nitrogen and phosphates, are those which, when found in manures, at present constitute their chief value. Commercial bones contain on an average 45 per cent. of phosphate of lime, and from 3 to 4 per cent. of nitrogen; Peruvian guano contains from 25 to 35 per cent. of phosphate of lime, and from 16 to 18 per cent. of ammonia; whereas bones only furnish about 4 or 5 per cent. of ammonia. When bones were first introduced, you recollect they acted wonderfully; and turnips were grown where they could not be grown previously. The reason that farmers have kept to half-inch bones as they do, is because the half-inch pieces are visible to the naked eye, and things like oyster-shells and so on, when

introduced, can be seen. If the thing were pure, finer bones would be better; because, if you take anything and break it, you increase the surface. The interior of the bone, before it is broken, cannot be acted on by the turnip or any other plant, only the exterior. The more it is pulverised, the easier plants act on it, and the smaller quantity is required for the produce of a crop. Liebig suggested that you should render the phosphates still more easily soluble by acting upon them by sulphuric or other acids. When first tried in 1840 and 1841, its results were immediately seen, and the immediate action of the soluble phosphate was to bring the turnip quickly past the fly; so that the great bugbear of the fly ceased to become the plague it was formerly, and the turnip crop was obtained with much more facility and much less liability to loss. But I have found from my own experience, that too much soluble phosphate is not advantageous. With the use of too much the plants are apt to grow up too quickly, and produce too large a cellular and vascular system; and as the days are shortening, and the soluble phosphate is absorbed, without the presence of some phosphates somewhat less soluble, they cease to find in autumn their proper manure in the ground. There ought, therefore, to be in all good manures for turnips, a portion soluble to carry the plant past the fly, and a portion somewhat less soluble to provide manuring matter for its after-growth. I never, therefore, recommend superphosphates to be prepared wholly soluble, but a portion only of them. With regard to guano, there can be no doubt of its beneficial application to grass land and to corn. I have myself used guano to the extent of 8 cwt. per acre annuum on grass land, with paying results; and Mr. Trethewey will tell you that he has used 3 cwt. of guano per annum for the last eight or ten years on the same grass land with the best results. You will find in all those crops in which you want to develop the leaf, you must use nitrogenous matters to some extent, as for grass and similar crops. You can also use guano to great advantage for corn crops, but take care not to use too much, or you may get all into straw. The corrective of that is salt, which is the best thing you can mix with guano or nitrogenous products. I will tell you how I think it acts. If you were to use a large quantity of salt over an acre of ground, it would kill every plant in it. The wheat plant during a certain portion of its life, is maturing the straw, and towards the end is maturing the ear. If I use nitrogenous matter like guano for my wheat, I don't want it to go into the straw, but into the ear; and for that purpose I use with the guano 5 cwt. or 6 cwt. of salt per acre. This does not kill the plant, but retards the early growth of the straw; and if this be retarded until the production of the ear, the whole strength of the manure will be shown in the development of the ear and the production of the ear instead of the straw, ensuring consequently an increased crop of grain. Therefore I recommend 5 cwt. or 6 cwt. of salt with 2 cwt. or 3 cwt. of guano, or other nitrogenous manure, to be applied for wheat or barley. If guano is used for turnips, I always recommend it to be used broadcast and harrowed in; and the turnips to be drilled with 1 cwt. or 2 cwt. of superphosphate of lime per acre; if you drill guano with the turnip seed you are liable to kill it, unless with great precautions; whereas if the guano be previously sown broadcast and harrowed in, the roots of the plants as they proceed laterally between the drills will find the guano ready to afford them their full supply of nutriment. In using superphosphate alone, I would advise a certain portion of it also to be used broadcast, and another portion in drill. The drill system was another invention of our ancestors, for the purpose of accumulating the small amount of manure they had, under the roots of their plants. Both the ridge and the drill systems are evidences of the paucity

of manures during the time of their invention. I now come to another subject, the adulteration of manures, a subject on which I should be happy to have it in my power to offer no observations; but, unfortunately, manures are adulterated. I came the other day in contact with manures by a company, not however in the west of England, who professed, I believe, to again protect the farmer. Their guano was said to be mixed with something which was to retain the ammonia, and then it was to be sold at about £10 per ton; its value when analyzed, was found to be only £2 10s. per ton! A superphosphate of lime was offered at about £7 per ton; when analyzed, it was found to be worth only £2 14s. per ton! There are sharpers in every trade, and parties will impose upon you if you do not take means to prevent it; you should never have any manures brought upon your farms without having them analyzed, or guaranteed to you of a certain value by analysis, and even then you would be protecting yourselves by having the bulk you received analyzed to see that it was equal in value to the sample which was offered you. If every farmer here present, either separately or in society, was known to have all the manures that went on his farm analyzed, and its value determined by analysis, who would ever come to offer them a manure that was not genuine? (Cheers). By a consideration of the different circumstances of the various valuable species of manures, I have drawn up a table seen above [the lecturer here pointed to a diagram]. There are here multipliers of value:—nitrogen, of £74 per ton; ammonia, £60; phosphate of lime, £8; phosphate of lime made soluble, £24; organic matter, £1; alkaline salts, £1; sulphate of lime (gypsum), £1 per ton. Silica I reckon of no value; I have never found it in any manure except when it was put there to deteriorate it. Carbonate of lime I reckon of no agricultural value in artificial manure; you are right in putting it (in its forms of shell sand, or deprived of carbonic acid in the form of lime), on your land if the land requires it, but in artificial manure you don't want it; its existence is generally evidence of something wrong. Any of you who have an analysis of manures, by taking those amounts I have mentioned as approximating somewhat to the agricultural value of manures, may, at all events, save yourselves from gross imposition. For instance, here is an analysis of an average sample of Peruvian guano, in which the valuable properties are organic matter, phosphate of lime, phosphate of lime made soluble, alkaline salts, and ammonia, giving, with the multipliers of value before-named, £13 12s. per ton as the value of the guano. Let us next take a sample of adulterated guano [pointing to a diagram]. This is sold to discerning farmers who want to buy good and cheap bargains. Peruvian guano is in the sole hands of the agents of the Peruvian Government, Messrs. Antony Gibbs and Sons, and those who buy directly from that firm; and they have only one price. But some farmers, who have not studied Dr. Franklin (who, in his "Poor Richard's Almanac" says, "At a cheap pennyworth pause awhile"), are very fond of trying to buy cheap bargains. The analysis of this adulterated sample shows its worth to be about £5 per ton, and that has been sold in large quantities for £10 per ton. Here is a sample of superphosphate of lime, only worth £2 3s. per ton, which I know has been sold at £7 per ton; whereas here is a good sample worth £6 18s. or £7, sold at its proper value. Here is a sample of Bolivian guano, which they were trying to sell in Liverpool at £10 a ton; I could not value it higher than £7 19s., comparing it with other sources for obtaining the same materials; they are now selling it at £9. Another is the worst of all, Mexican guano. Anything called guano, coming from abroad, the farmers would buy, at a little less than Peruvian. This Mexican guano was bought by a whole-

sale house in Scotland, for £7 a ton, and it has been sold to the farmers at £8 and £9 per ton; when analyzed, its value was found to be £2 9s. As far, however, as manures are concerned, you can easily secure yourselves by dealing with men of honest reputation, and by taking the precaution, as other people do who engage in business, of seeing that the materials you receive are according to sample and money paid. If you do so, you will undoubtedly put a stop to that which I have been endeavouring to do for a long series of years, the adulteration of manures; I do not expect to be perfectly successful unless the farmers themselves give their aid in preventing it. You see then, in conclusion, that I hold the opinion that the old leases ought to be abrogated, and that you should have more freedom of action on your farms (cheers), because you have now the opportunity of bringing upon your lands manures from extraneous sources, by which you can grow a much larger quantity of produce than this county has hitherto produced, benefiting alike the landlord and the tenant. And I think you ought to take care to look out for the increase of your money within the twelvemonths of the time you lay it out in manures. You should take a single crop and manure that crop, and get your money back out of that crop. It is a much better principle to put just enough manure in the land to get one crop, than to be letting your money lie out a number of years, losing thereby the interest of that money in your land. I am sorry the time allotted to me has been insufficient for me to enter more deeply into this subject. I am exceedingly obliged for the kind and attentive hearing you have given me; and in sitting down I thank you for your kind attention, and shall be happy to give you any further information in my power (loud cheers).

Mr. TRETREW rose with much pleasure to propose a vote of thanks to Mr. Nesbit, for his interesting and valuable lecture. They must all be thankful for the light Mr. Nesbit had thrown on many subjects relating to agriculture, and particularly with reference to shell sand, guano, and other manures. He could bear testimony to many of the lecturer's points, though not personally to all that he had brought before them. A great many of them, however, he was prepared to corroborate, having himself carried out many of them to his satisfaction, and to the satisfaction of those who took the trouble to visit his farm and inspect the results.

Mr. JAMES TREMAIN seconded the motion.

The CHAIRMAN, before putting the motion, stated that the Professor was ready to give information in answer to questions from any gentleman who desired to have the subject further elucidated.

Mr. T. ROGERS, of St. Just, in Roseland, begged to ask the learned Professor what farmers were to do with their waste straw, instead of throwing it about the lanes?

Mr. NESBIT said, in some parts of the country there was generally little straw enough. He would suggest what might be done here with waste straw. He thought that in this county there was not enough of sheep-folding. He had seen sheep folded on a turnip field, the turnips being removed from the first place of folding to the last place of folding in the field, and a proper amount of straw required for manure being placed on the portion whence the turnips were first removed; the turnips were then removed from the next place which was to be folded, and were chopped up and given to the sheep in feeding troughs in the first inclosure; and this was repeated until the whole field had been folded over, and the straw well trodden in, when the whole field was afterwards ploughed in for the following grain crop. Although in this county they were exposed to certain winds that were not at all agreeable, yet he thought the feeding of sheep on the land might be carried to a greater extent than it was at present. A friend of his had tried the experiment of folding two lots of sheep on

the same amount of food; he kept thirty sheep folded in the open air, and they gained on an average 1 lb. a week each. For the other lot he placed double hurdles, with straw between, against the prevalent wind; the hurdles fastened together with packing string, and on the top were placed other hurdles covered with straw, forming a *lean-to*, so that the sheep might go under cover; and these sheep made on an average 3 lb. of meat each per week on the same amount of food as was given to the others, which, being exposed, gained only 1 lb.; and all the time they were each treading in the straw on which their food was placed.

The CHAIRMAN, for the credit of the county, must inform the learned Professor that to a certain extent the days for strawing roads were gone by (laughter). He remembered when it was an invariable rule to throw out all the straw on the high roads, until Parliament interfered, and laid a penalty on those who threw straw on the roads. He regretted to say that in those early days farmers were so stupid that they were obliged to get their knowledge from Act of Parliament (laughter); but in the present day intelligence comes to them otherwise; men are not only desirous of improving themselves, but of improving others also.

Mr. WILLIAMS said he was desirous of asking a few questions. He thought the result of certain portions of the lecture was that, as a general principle, in order to make farm-yard manure most valuable, it should always be kept dry?

Mr. NESBIT: Not perfectly dry; but still not having too great an amount of moisture.

The CHAIRMAN gathered from the lecture that if vegetables, in their purest and most natural state, were converted into manure directly into the soil, they would make better manure than by being passed through any intermediate state?

Mr. NESBIT: They would make a larger amount of manure, but under present circumstances the feeding them off would be advantageous, as they would produce a paying value in beef and mutton.

Mr. BRYANT, of Padstow: When Mr. Nesbit was referring to the analysis of Mr. Olver's soil, I think he said the carbonate of lime should be about two per cent. I notice that Mr. Olver's carbonate of lime is nearly one-third short of that.

Mr. NESBIT: I said getting on to two per cent.

Mr. BRYANT: Of course Mr. Olver is exhausting that lime every year he tills his land; but I think you remarked that he may continue for a long time with that quantity in the soil. If "getting on to two per cent." is necessary, he ought to begin to carry lime again.

Mr. NESBIT: What I meant was, that Mr. Olver having got that quantity, if I were farming there, I would not lime again till I saw a distinct and visible want of it. If you calculate the amount raised from the soil—that an acre of ground comprises 43,570 cubic feet, you will find that two per cent. will give a very large amount of carbonate of lime; and only a very small portion is rendered soluble every year. I think Mr. Olver has got, at all events, enough for some years. But I grant that if you go below a certain amount, there would be depreciation, and he would want a little more. It is a question of degree. The fact that all the western districts require lime must be taken as one truth: the fact that persons in the western districts can carry too much lime, must be taken as another truth. The practice should be between the two. I have found that in most cases of western soils, when the quantity of carbonate of lime borders on two per cent., it will be found an available valuable quantity, and I think that the fact that western lands require lime, and that certain parties may continuously carry more than is required, will reconcile the discrepant views of various champions on both sides, as to the use of lime.

Mr. T. ROGERS thought the use of lime must depend on the nature of the soil and subsoil; with him lime was of no use; he lived on the coast, and supposed his subsoil was calcareous.

Mr. NESBIT: Possibly. Chemical analysis would easily detect the amount of carbonate of lime in the soil. You will find if you take a portion of your soil, and pour upon it a mixture of muriatic acid (spirit of salt) and water, if there is a considerable effervescence, you may take it as a general rule, that the land does not require lime. I do not say that *all* soils which effervesce do not want lime; but the majority which effervesce do not.

Mr. ALFRED LLOYD FOX, of Falmouth: The lecturer has told us that linseed cake is exceedingly valuable for fattening cattle. I have seen an advertisement of a seed, known as "locust seed," being lately imported. It is said to be more nutritious and more useful than linseed; and it appears to possess a larger amount of saccharine matter.

Mr. NESBIT: I have analyzed some of the locust seed, or bean; but it was in rather a decomposed state; it was a little moist. As far as that analysis went, I could not compare that sample to oil-cake; the nitrogenous matter it contained, as far as I recollect, was only about one-fourth that in oil-cake; there was more sugar in it, but less oil. But before I give a decided opinion, I should like to have a sample of the very best.

Mr. A. L. FOX supposed that as it possessed more sugar, it would produce more fat.

Mr. NESBIT: But the linseed contains a large amount of oil—ten to twelve per cent., and also of mucilage. The amount of non-nitrogenous matter was probably equal in both.

Mr. TRETHERY asked the lecturer if he would state his opinion as to any difference between oilcake and rapecake—not oilcake of first-rate quality, but of general quality.

Mr. NESBIT: I have analyzed both oil-cake and rape-cake; as far as chemical qualities, they are very similar. But there is this peculiar stupidity on the part of animals, that they will not eat rape-cake. Rape-cake contains as much oil and other matters as linseed cake; and if you could get animals to eat rape-cake, they would do as well on it. But they have their peculiar tastes; and I suppose when they have been accustomed to the champagne of linseed, they will detest the ginger-beer of rape-cake (laughter). When you can cook the two together, and present the mass to animals so that they can select them, the one does as well as the other. Rape is the more economical in price; but since its feeding purposes have become known, its price has risen very considerably. It is, however, a question of ingenuity on the part of farmers to induce animals to eat rape-cake instead of oil-cake.

Mr. TRETHERY then asked a question with reference to the difference between linseed and crushed linseed in preference to cake? Were the fattening qualities in the oil, or in the shell and seed?

Mr. NESBIT: There are two things to be considered in the fattening of stock; but those things would more properly be considered in a lecture on the fattening of stock. Nitrogenous matters go to the production of flesh; mucilage and oil go to produce fat. As far as comparison of oilcake with linseed itself, there is a larger amount of oil in the linseed than in the cake; but then there is a less amount of nitrogenous flesh-producing matter. So that, if I had the two together, at the same price per ton, I would buy the cake in preference. But we know that linseed is at a greater price per ton; we get the oilcake cheaper when the oil has been pressed out of the seeds; therefore I think there can be no doubt that the cake itself, after the oil has

been pressed out, is cheaper to the farmer than the buying of seed itself at a higher price.

Mr. A. L. FOX believed fish were very rich in phosphates and in the nitrogenous principle. As a Cornishman, he would ask the lecturer's opinion whether it would answer, in a commercial view, to carry on fisheries along the coast, for the purpose of catching fish to be applied as manure.

Mr. NESBIT: In my opinion, the question is a most important one for Cornwall. When guano shall cease to be brought to this country, where shall we get our ammonia from? We know that every portion of guano has been fish, eaten and digested by birds; a portion of the fish has gone to form the flesh and bone of the bird; but every valuable particle of guano, both phosphates and nitrogen, has been got out of the ocean. Therefore, in future years, looking to the time when necessarily we shall lose our supplies of guano, I consider it a most important national project—the founding means of procuring manure from fish. There would thus be constant employment for fishermen; and all would be fish that came to their net, because all could be manufactured into manure probably equal to guano.

Mr. TRETHERY said, as a Cornishman, he might moot another question—whether the refuse pilchard salt was superior to common salt for agricultural purposes?

Mr. NESBIT said, the scales of fish in the pilchard salt contained nitrogen of some value; but practically there was not any very great difference, though probably the value might predominate on the side of dry fishery salt.

Mr. BRYANT said a question had been submitted to him, whether, when there might be sufficient lime in a soil, lime might not be applied in a quick state?

Mr. NESBIT should say that, if the soil had already a sufficient quantity of lime in it, no greater amount was required in any condition. If it were quick, in a few weeks or months it would re-absorb carbonic acid from the air, and would take its former state as carbonate of lime, merely differing in mechanical condition from the limestone from which it was first produced. In a book of his, comprising a series of lectures, he had given his consideration to the subject of the use and abuse of lime; and he thought he had proved there that, with the exception of some little effect at first, the quick-lime would in a very short time become mild: it would reassume its character of carbonate of lime, and its main action was in this form.

Mr. KARREEK felt much pleasure in stating how much gratified he had been with the lecture that evening. He had himself paid some attention to agricultural chemistry, and knew something about manures, having been the first to introduce guano, as well as superphosphate, in this district. The observations of the lecturer were such as were well worthy of every individual's attention. There could not be a doubt that great adulteration had been carried on; but he did not know that, in this district, any guano had been brought here, except that of Antony Gibbs. With regard to phosphates, they were sold under various names; and he believed their qualities also varied considerably, and their prices. But there could not be a doubt that any good superphosphate should contain twenty to twenty-five per cent. of soluble phosphate; as did Lawes's superphosphate, so much used in this neighbourhood. There was another remark which had fallen from the lecturer, bearing practically on the subject of this evening's meeting. The lecturer had told them they should have their manures analyzed; and he (Mr. Karreek) would suggest that they should form a club, and make a subscription among themselves, for having their manures and soils analyzed. The amount of subscrip-

tion would not be very large, while the benefit would be very considerable.

Mr. W. H. JENKINS complimented the lecturer on the success of his experiments and the elegance of his manipulation.

Mr. NESBIT said, an observation had fallen from Mr. Karkeek, that there ought to be twenty-five per cent. of soluble matter in superphosphate. As this was contrary to his (the lecturer's) opinion, it was right he should say so. He had found that if superphosphates had too great an amount of *soluble* phosphate, without a corresponding amount of a more insoluble phosphate, they stimulated the early growth of turnips too much, and the latter period of their growth not enough. He had found, practically, that if we had thirty-three per cent. altogether of phosphates, one-half soluble and the other half in a condition eventually to be assimilated by the plant, such a manure would support the turnip in the early period of its growth, and would not be found wanting further on in the autumn.

The CHAIRMAN, with some complimentary and general remarks, put to the meeting the proposal of thanks to the learned Professor, for the excellent and intelligent manner in which he had conveyed information in his lecture, and also for the agreeable way in which he had replied to inquiries.

The proposition was agreed to by acclamation.

Mr. NESBIT returned thanks. He had been exceedingly happy to meet the agriculturists present; and, if circumstances and his pursuits might permit, he should be happy to meet them again, and at all times should be glad to do anything in his power to promote the prosperity of the agriculture of Cornwall.

On the motion of Mr. W. James, seconded by Mr. T. Rogers, thanks were voted to the Chairman, who briefly acknowledged the compliment. And on the motion of Mr. R. Doble, thanks were voted to the Mayor of Truro for the use of the hall.

The meeting then separated.

## ELECTRICITY.

By JOHN TOWERS, M.H.S., &c.

I adopt this word of vast and comprehensive import for the heading of the following communication, because I plainly perceive that the question of the universal presence of this most subtle and all-pervading element is shirked by our lecturers and analytic chemists, with, perhaps, the one exception of the great and renowned Michael Faraday. Referring now to the lecture of Mr. Nesbit "*On Agricultural Chemistry*," printed in the *Mark Lane Express* of Nov. 24th, 1856, I meet with the following observations in the first column of page 4 of the Supplement:—(1.) "Farm-yard dung is neither more nor less than decomposed vegetable matter, derived from plants which once had life in the soil, and which, when returned to the land, will furnish the necessary elements for reproducing vegetable life." (2.) "Considering the subject of the decomposition of vegetable matters, you must remember that some elements of vegetables are volatile and some soluble, and that those which are least volatile and least soluble are also least valuable. The substance in manures which is most volatile is ammonia, and where there is bad management this will pass away in the air, while the potash and soda and other soluble materials will be washed away."

While prepared to admit the abstract fact of the above two positions, it is evident that processes of decomposition through some disturbing agency are established. Now what can be, or is, that agent? Is it *heat*?—is it *moisture*? Both the one and the other are *effects*, and not *causes*.

But to proceed. Mr. Nesbit told his hearers (3) that "the quality of the manure must depend upon the quality of the vegetables on which you feed your animals. If you feed them merely upon straw, the value of the dung will be in proportion to that of the straw; whereas, if you add oilcake, and other substances of a similar

nature, there will be a proportionate increase of value."

(4.) "There is *no ultimate action in the animal economy—no action, that is, in relation to the food which the animal consumes—that does not take place in ordinary decomposition.*" These appear to me bold if not gratuitous assertions. Straw consists mainly of vegetable fibre, glazed with a coating of flint obtained from the ground by an electro-chemical process. In itself it cannot furnish much nutritive matter; but still in its passage through the animal's alimentary system, it must have acquired more or less of animal matter. Oilcake is produced from linseed-meal heated to a certain degree, deposited in canvas bag, and forcibly pressed by heavy stamps. The cake must therefore comprise much vegetable farina and a quantity of strong oil that cannot be expelled by heavy pressure. The same may be said of *colza* or rape-seed cake. But upon what principle can it be correctly asserted that "the animal system does not add anything of value, as the animal only gives forth what it receives"? What, then, becomes of the biliary, abdominal, and urinary secretions that pass through the bowels of an animal, and are expelled with the dung? Do they, in fact, go for nothing, and are worthless? And yet so they must be, if it be true that, "so far as manuring is concerned, the dung of the animal is always less valuable than would have been the food on which the animal had subsisted."

We must not be deluded by speculations or crude notions. The plain fact is, that animal fæces, combined with digested vegetable fibrous matter, contain the elements of volatile and mineral salts, which submitted to chemical (electrical) action foment, and gradually develop ammonia, carbonic acid, and other products, that are so essentially requisite for the perfecting of the vegetable economy.



## THE APPLICATION OF LIME.

At a recent meeting of the Hexham Farmers' Club, Mr. R. E. Ridley read a paper on this subject, from which we make the following extract:—

Lime differs from most other manures—it may almost be said from all—in this respect, that it is advantageous in agriculture as a mechanical agent as well as a chemical one. It not only supplies food to the plants directly and indirectly by its influence upon the other constituents of the soil, but it is of great advantage in rendering clay soils open and lighter, and in making sandy porous soils more compact and firm. It is well known that hot lime has a great affinity for water. It will gradually absorb the moisture from the atmosphere, swell greatly in bulk, and fall to a fine powder. Now, when hot lime is ploughed into the land, and allowed to burst there, it will exert a powerful disintegrating effect upon the soil. Its operation will be something like the action of frost, which we know thoroughly opens and lightens the soil, with this difference, that the particles of lime becoming mixed with the soil, prevent it from becoming trampled into so close and hard a state as it would otherwise be. When, therefore, lime is applied with a view principally of lightening the land, it is essential that it be applied as hot as possible. In fact, it should be ploughed in as it is carted from the kiln. None of it should be over-night exposed to the dews, otherwise you may expect it to be a powder in the morning, and its utility for the purpose you desired greatly injured. When lime is used on light soils with the object of increasing the tenacity and solidity of such soils, it is better that it should be in the state of hydrate—that is, be completely burst or fallen by its union with water, before it is ploughed in. But water should be thrown on to it as soon as possible, or if it is allowed to fall from the absorption of moisture from the atmosphere, it should be put into large heaps and well covered, and not be spread upon the surface of the field several days before it is ploughed in, otherwise it gradually combines with the carbonic acid of the atmosphere and becomes mild. In this state it is the same as chalk, and will not answer the purpose for which it is intended. The reason is, that hot lime unites chemically with sand, and forms a silicate of lime, and by this means the sandy particles are cemented together to a certain extent; but if the lime be mild or if chalk be used, unless it be applied in very great quantity, there is no consistency produced, the particles of chalk will not adhere to the sand nor to each other, and the land is as friable and open as before. To obtain, therefore, the best mechanical benefits from lime, it ought to be applied hot, unslacked, to strong land; and slacked, but still hot, to light soils. But perhaps the most important use of lime in agriculture is its chemical effects. It destroys many injurious substances that from time to time are generated in the soil. During the progress of vegetation there are constantly being formed various vegetable acids that are more or less injurious to vegetation. Lime, when brought in contact with these injurious matters, to use a common phrase, kills them, that is, it chemically combines with them and renders them harmless. It does so much more quickly when used hot, but will ultimately effect the same purpose when mild, though much more slowly. Grass land in the state just described is said to be sour; and it is well known that if it be ploughed up and thoroughly limed, it will be, for a time at least, cured. The same process goes on in arable land, though its effects may not be so well known or so easily recognised; and there is no doubt that in lands deficient in lime, great injury to vegetation is thus caused. Whenever we form compost heaps from the cleansing of ditches, or the cuttings from road or hedge sides, we invariably mix hot lime with these ingredients; and wisely, because it is a powerful promoter of vegetable decomposition. Now, when lime is put into land it acts exactly in the same way; you are in reality making a vast compost heap. If, for instance, you plough it in with the lea, it will decompose and

destroy the grass and other roots, thereby rendering them more readily useful as manure. So, also, when it is applied to soil containing fold-yard manure, it will cause the manure to decay much more rapidly, liberate the elements of which it is composed, and render them available to the growing plant. If, on the contrary, it is applied to a poor, hungry soil, it has comparatively small effects. For instance, supposing an unmanured soil to grow six bolls per acre, and a well-manured one twelve bolls, by the addition of lime the former may produce say nine bolls, being an increase of three bolls from the use of lime, while the latter may produce eighteen bolls, being an increase of six, and showing a yield of three bolls in favour of lime being applied where there is manure. The reason of this additional produce is perfectly plain to the chemist, who knows that the lime will decompose the manure more rapidly, and make it act more speedily. Land, therefore, that is properly supplied with lime will cause the fold-yard manure that is put into it to be spent much sooner than if it were deficient in lime. It will enable the farmer to have his manure nearly all supplied to the growing crop the year it is applied, instead of having it partially decomposed during the winter, to have its elements washed into the subsoil or into the drains. And it becomes a plain corollary to the principle laid down, that the manure required by land should be applied to it each year, instead of having put into it in one year what is intended to serve four or five. There is a peculiar property which lime, in common with other alkalies, possesses; it is that of inducing, while decomposing vegetable matter, the nitrogen of the atmosphere to unite with the oxygen that is liberated by the decomposition, and form nitric acid. Nitric acid is the active principle in nitrate of soda, and is, as we all well know, of great value as a manure. Lime, therefore, not only sets free the nitrogen that is in vegetable substances by decomposing them, but also during this process of decomposition so disposes matters that an additional supply of nitrogen is taken from the air and made available as a manure. There are other advantages to be gained by the use of lime, but they are so obvious and so well known that we pass on with the mere mention of them, especially as this paper is already too long. Plants take up lime and assimilate it to their structure in considerable quantity, varying from 8½ lbs. per acre for an ordinary crop of wheat to 226 lbs. for a crop of potatoes. It is therefore important that there should always be a supply in the soil, which they can reach. Lime is famed for destroying the tough useless grasses, and for promoting the growth of a sweet tender herbage. It is also valuable for killing noxious vermin, especially worms and slugs, and will, when hot, if it comes in contact with their eggs or larvae, most certainly destroy them. Lime ought always to be applied to land in a hot or caustic state, where it can be procured in that state at a moderate cost. In its mechanical influence upon soils, we have seen that it is valuable in this state only. And though in its chemical effects it will, generally speaking, in the end be the same, whether hot or mild, yet its action in the former state is so much more rapid and effective that there can be no doubt but that it is most useful when so applied. We ought, therefore, to avoid allowing it to become mild before ploughing it into the soil. We think the proper time for applying lime is on the grass at the time it is ploughed, for the reason before alluded to, that it is effective in destroying quickly the roots that are being turned into the soil. It ought, also, we think, to be applied each rotation of four or five years, as the case may be. And that when the land is in a fairly limited condition, the periodical addition may not be more than from two to three tons per acre, varying with the tenacity or looseness of the soil on which it is used. On grass land it should be applied as frequently, though not hot, but in the shape of well-limed compost. It is assumed that the land to be limed is moderately dry, either naturally or from being drained, because lime applied to very wet land is likely to do no good whatever.

Mr. Wood remarked that he had never seen lime take a greater effect than some taken from the ruins of houses. Mr. Ridley said the plaster of the walls of stables contained a large por-

portion of nitrate of lime. During the war of France with this country, the importation of nitrate into France was prohibited; and the French obtained from the walls of cellars and stables in Paris sufficient nitrate to make their gunpowder. Lime had a peculiar property in assisting the formation of

nitric acid. He had seen it applied to old grass, and it came away green very soon. When lime and manure were put into the soil together they had a wonderful property of making more manure out of the air, which was a clear gain without any expenditure, Professor Liebig said to an immense amount.

## THE LANDLORD'S INTEREST IN A LEASE, AND ITS TENDENCY TO PROMOTE CULTIVATION.

At the annual meeting of the Hexham Farmers' Club, held last month, JOHN GREY, Esq., of Dilston, the President, rose to propose for discussion, as previously announced, "The Landlord's Interest in a Lease, and its Tendency to promote good Cultivation." After a few prefatory remarks, Mr. Grey said, the conclusion the club had come to on former occasions, with regard to a lease, was, that a lease was desirable in the occupation of land, because of the security of tenure which it gave to the occupier, and of the encouragement it gave to good cultivation. He would not at that time, nor was it necessary for him to do so, go over the ground again, because the club conceived the matter to be settled; but at some of the discussions a good deal of controversy had been engendered, and, arising out of it, remarks had been made in the public press, which were scarcely just or warrantable, under the circumstances. He did not attempt to decry the liberty of the press, or to deny its right to censure any subject of national importance; but it did happen occasionally that subjects were taken up by persons who wrote with a theoretic view of matters, and who had not a practical knowledge of the subject they criticized. It would be in the remembrance of most of the gentlemen present, that a number of farmers in this neighbourhood undertook to draw out a set of covenants for a lease, which they thought would be just and beneficial to both landlord and tenant. This was a one-sided affair, because it was prepared entirely by farmers; and in certain papers distinguished for their liberality and the great abilities of their writers, these covenants had been very much canvassed and very much condemned, although they were drawn out by farmers themselves, as covenants to which they were willing to subscribe. Now it was necessary to remark—because he knew that the gentlemen who undertook the task of drawing up the document acted upon the principle—it was necessary to remark that no contract whatever, whether made between nations, communities, or individuals, could be expected to be permanent and satisfactory, which was not founded upon principles of equity and strict justice. He considered that this part of the subject had been somewhat forgotten by the public press, who seemed inclined to treat the contract between landlord and tenant as entirely commercial. But there was, in reality, a great difference between the mere manufacturer of wearing apparel, for instance, and the manufacture of human food, for he looked upon agriculture as such; and it was not possible to conceive that it was right and just to either party to maintain that land should be managed and considered merely in the same view as a cargo of merchandise, or a bale of cotton or wool. What was land? Was it not the property of an individual? It was so, whether by purchase or inheritance. It was that from which he drew his living, and to which he looked for the support and education and settlement in life of his family; and it was his right, interest, and duty, as the father of a family, to see, if he granted a lease of his land for ten, eighteen, or twenty years, that that land was let under such conditions as were likely to bring it back to him in as good a state as it left him, or at least without any great deterioration. He took this, the unpopular side of the question, for argument's sake, and without anything like a bad feeling to the farmers, for whom, as they well knew,

he had the warmest sympathy. He sympathized with them in their difficulties, their labours, their anxieties, their strugglings with adverse seasons, and in all circumstances of adversity and trial. He would, therefore, say he believed that, in taking a view which some might think erroneous, he should not be accused of taking a part against the farmers. He merely wished to show that there was justice and necessity in a landlord having certain restrictions in a lease, in preference to leaving it open. But, besides his interest in the management of the property, the landlord had a large investment upon that property, in the shape of buildings, enclosures, &c. All these things it was his duty to see were preserved in good condition; and they well knew that, in the hands of some tenants, if there were no restrictions in the lease, the very contrary of these results would be brought about. An objection had been made to the system of granting leases—and he thought there was some argument in it—that it could not be expected that a man should farm equally well up to the end of his lease as he did at the beginning; but he thought, to obviate this difficulty, it was possible to manage so as to do full justice to the land, by maintaining its fertility, and not make the landlord the loser. He had himself introduced something of the sort; and he believed that in the very lease drawn out by the committee there was a proposition that, if a farmer did not wish to renew his lease, he should have an equivalent for his unexhausted manure. He believed this proposition had met with general acceptance, and was likely to be practised. Another objection was that, in this county, leases were hereditary property; and they knew that here, as elsewhere, men who took leases were mortals. Now, if land should be given into the hands of a person, without any restrictions at all, however great might be the confidence reposed in that person by the owner, he would have no security that the tenant would live out even a third part of the lease. At his death, it might fall into the hands of any person, a seaman, a draper, or a tailor; and was it to be supposed that his heir, whoever he might be, was to be allowed to make mincemeat of the land—to plough up the grass land, to cultivate the better portions of the soil, neglect the inferior, and go on making all he could at the expense of the farm, until at length the landlord was obliged to go to enormous expense to put his property in the same state as when he let it? It had been said that it was great presumption at this day to prescribe the course of management to be pursued during fifteen or twenty years, for we lived in an age of progress, and in such a time immense improvements were made. Now, although they were not presumptuous enough to suppose they could look forward for so long a period, yet they did happen to know that there were certain things injurious to both parties, and from which both should be protected, which it required little foresight to see and to guard against. He read in a newspaper the other day, an article ridiculing the provisions in a lease which imposed penalties on tenants who sold the straw off a farm without bringing back an equivalent in manure. Now he did not think this was deserving of ridicule. He recollected before nitrates, phosphates, and guano were discovered, that there was no other way of preserving the fertility of land but by converting the straw into manure. It was not, therefore, unreasonable that if a tenant were so situated, near a large manufacturing town for instance, that he found it profitable to sell his hay or straw, he should be required to bring back an equivalent. He had already said that there were men to whom it would be safe to grant an open lease. They must be men of great judgment, experience, honesty, and of adequate capital; but it was impossible to

know what might be their circumstances before the lease expired. He had had much intercourse with farmers, and knew some who farmed well and were excellent persons; but again he had seen some of a different class. And this was quite inevitable. There were some who farmed ill through ignorance: these were, perhaps, to be pitied. Others farmed ill through penuriousness, and under the impression that a penny saved was a penny gained, and would not lay out a pound in manure although they knew it would bring them in £2. There were some who farmed ill from worse motives, he feared; and especially when the lease drew near its expiration. Now, if a landlord saw that a farmer whose lease was about to expire was wasting his produce instead of reducing it into manure, was he not entitled to put a check upon him and say, "My property shall not be wasted in that way?" He thought they would agree with him that there was some necessity for such a restriction. One of the most singular remarks upon the subject he had met with lately, was to the effect that it was a great shame that plantations and underwood should be preserved from the use of the tenants. Now this remark, in his opinion, showed the greatest possible ignorance on the subject. Who did not know that this country contained many pieces of rocky, hilly, and waste and barren ground, which were of no use at all to the tenant, and which he would be glad to be quit of; but which, planted with wood, by the landlord, produced timber for the use of the nation, gave an ornamental appearance to a farm and district, and were of incalculable service in sheltering the cattle? It happened upon the property he had managed for several years past, where they had above 3,000 acres of woodland, there never had been a complaint of it preferred by a tenant; but, on the contrary, only the other day he had been requested to enclose a piece of land for a tenant, in order that it might be converted into a plantation; and the tenant was not only willing to give up the land, but actually offered to lead the stoues required in making the fence round it. This, he believed, was a complete refutation of the absurd remark that tenants ought to have control over the woodlands. There was another thing which deserved to be mentioned. A good deal of injury was done to land by neglecting to clear out the ditches, in order that the rains and floods might drain off properly. And if a man were so slovenly as to allow his drains to get filled up, and the wet to soak into the soil, was there anything unreasonable in a landlord seeking a person to clear out his drains and ditches at the tenant's expense? And yet this provision was quibbled at as injurious to the tenantry. It was said again, "Let tenants alone; they are compelled to farm well for their own benefit;" but every man had not the sense to know, or the liberality to see and act for his own

benefit. If he had, why should a farmer stint his land of manure, when he knew that for every £50 expended in its purchase, he might expect to receive £100? And then, again, some men would thrive on a farm, and others would starve upon it. With respect to manuring, he had said that £50 laid out in guano, for instance, would bring back £100. It used to be different in former times. He believed most of the money which was made then was made by sheer economy, by early rising and late sitting, by great watchfulness, and the extreme of carefulness. He could recollect a very decent old man, who had risen from being a farm-steward to be a farmer himself, and who had not been long in one place till he got another. He (Mr. G.) took the liberty of asking him one day how it happened that he was getting one farm after another, and thriving, as he seemed to be? The old man said, "I am the first up in the morning, and the last in bed at night. I see every furrow that is drawn; and, what is more, some people can get money, but do not know how to keep it; now, when I get one shilling, I do not spend it, but I wait until I get another to put on the top of it, and so it accumulates." Farmers could not do so now; for although industry and energy were always desirable, they must have better principles upon which to work with respect to the laying out of money. There were now manures which were required to ensure the success of certain kinds of crops, and money must be expended upon these; and it was not sufficient to get up in the morning, but the farmer must call in the aid of science, and proceed upon scientific principles. The chairman then reverted to his original proposition, that a landlord must have protection for his property; where he found an honest man he would, he said, give him a *carte blanche* to do as he pleased, but, inasmuch as a man might go down in the world, and might be compelled by the force of circumstances to take advantage, however unwillingly, of the open character of his lease, it was only right and proper that there should be reasonable restrictions in every lease which should ensure the return of the land to its owner in the same state as it was when he let it.

Mr. Dop thought that after the discussions which had taken place on the question of leases the club should come to some formal resolution on the subject, and he accordingly proposed "That this meeting, while opposed to a tenant being tied down and hampered by unnecessary restrictive clauses in his lease, is as decidedly of opinion that in all leases there ought to be certain general principles laid down as to the management of land, whereby a proprietor shall receive his freehold back again at the end of the lease in at least as good a state as when he let it."

The resolution was carried unanimously, with cheers.

## THE SHELTERING OF SHEEP ON TURNIPS.

SIR,—The exceedingly changeable and generally rainy weather which has been experienced during the present winter, has frequently led me to contemplate the necessity of and the advantages which might be gained by affording shelter to fatting sheep on turnips; and the statement made by J. C. Nesbit, Esq., while delivering a lecture at Truro, as published in your paper of the 20th ult., confirms my opinion, even to a much greater extent than I could have anticipated. He there stated from an experiment made, it had been proved that sheep fed upon a certain amount of food, and exposed to the vicissitudes of the weather, gained upon an average 1 lb. per head per week; while an equal number of the same sheep, receiving the same quantity of food, but somewhat protected from the weather, gained upon an average 3 lbs. Now this is a most startling difference, and deserves the attention of every agriculturist. If an addition of 2 lbs. per head per week is to be gained by simply affording the temporary shelter described by the learned professor, I should think that without delay every sheep farmer will adopt that or a similar plan, and deplore the waste of food which for want of such a simple contrivance

they have for so many years permitted. It is quite beyond a doubt that one great element in the fatting of animals is comfort, and when that is wanting they fail to derive that benefit from their food which they would otherwise do. When an animal is frequently disturbed, it affects him in a similar manner that mental exertion does a human being; and when exposed to cold and wet, and an uncomfortable bed, so much so that their rest is disturbed, it is but natural to suppose that this must all act injuriously upon their constitution, and much of that nutriment which would otherwise go to improve their carcase is wasted in restoring to the body its natural warmth; or by reason of the falling-off of that proper temperature the food becomes improperly digested, and consequently the animal fails to derive full benefit from it.

Now all these reflections have been repeatedly brought before me, this winter, on beholding the wet and uncomfortable state of my fatting sheep, and that too upon very dry land. And now that Mr. Nesbit has put us in possession of such a clear proof of the impropriety of allowing such a state of things to exist, I should be most willing to exert myself, along with my brother farmers, to devise some means to secure such a desirable result; but here some may say the plan is already laid down, do as Mr. Nesbit has described,

and in all probability you will obtain a similar result. The answer is so far good: but I am not satisfied that the plan mentioned by Mr. Nesbit, of placing straw hurdles, is sufficient to meet all circumstances; for although it might protect a small number of sheep from the beating winds and driving rains, sufficient shelter could not be afforded for a large flock: and when the land is wet and puddled, they must still be subject to the unpleasantness of a wet bed.

Formerly sheep were considered an advantage to the farmer, not only on account of the benefit they impart to the soil, but because they economize labour, in so far as the turnips consumed by them neither require to be pulled or carted; but farmers now begin to consider this a false economy: they discover that, in order to secure the full advantage of turnips, those not consumed in the early part of the winter ought to be pulled and protected from the frost. Another advantage of sheep is that, on farms where plenty of root crops can be grown, sufficient straw cannot be found on the farm to litter comfortably the stock in the yards, sufficient to consume these roots; but the hardy nature of the sheep fits them to consume the roots almost unprotected in the field. I do not see, however, why they should be subject to such treatment. The sheep is by nature adapted to live on scanty herbage, and to endure the severity of a rigid climate, and has been far too generally treated in this manner, till custom has almost reduced it to a second nature; so that time is the only agent which will by-and-by reconcile the animal to more careful treatment, and bring it to enjoy the comforts of further domestication in a farmyard. And my object shall now be briefly to consider what kind of yard would be best suited to this purpose.

It is well known that sheep do not thrive well in a common strawyard. In the first place, it is injurious to their wool, and they are far too much disturbed by the tumult necessarily going on there; and, as I formerly observed, all the straw on root-growing farms is generally required to litter comfortably the horses and neat stock, while the latter are consuming their proportionate share of the roots, so that something of a different description must be devised, suited to the accommodation of fattening sheep. An idea which has suggested itself to me is this: In the most central and convenient part of the farm, erect a yard and shed of the following description. The yard and shed, of course, would be proportionate to the number of sheep likely to be fattened. Adjacent, would be erected a shed for the storing of turnips, hay, cake, &c. The whole floor of the yard and shed I would propose to lay with a thin

coating of asphalt (which can now be done at a moderate expense), thereby rendering it perfectly smooth for clearing off the manure and preventing the loss of the liquid, and comfortable for the sheep to lie upon. The whole of the manure I would cause to be swept or scraped off every morning, and deposited in a heap, in a shed, under cover. In a convenient situation in the yard, I would sink a well, and place a pump for the liquid manure, and would apply as much of this to the heap of solid manure as it would possibly absorb; and thus, with a little preparation, a quantity of most valuable manure would be obtained, sufficient for the production of many acres of turnips, if judiciously applied. Around, or adjacent to, this yard, I would sow down a field as permanent pasture, which would be found most useful to turn the sheep out on occasionally, for the benefit of air and exercise. And lastly, if required, I would plant, for shelter, on the exposed side, a narrow strip of trees. My yard I would now consider complete; and I feel satisfied that such an erection would prove of the greatest utility and advantage. The greatest objection that can be raised to the plan is the expense, and this would not be so very considerable; but, calculating even upon only half the increase that was derived from the straw hurdles mentioned by Professor Nesbit, and the great advantage which would be derived from the manner of treating the manure, I am convinced the expenditure would very soon be repaid: but, until farmers are fully alive to the great necessity of keeping fattening stock comfortable, by cleanliness, warmth, and quietness, and press their landlords to furnish them with suitable and commodious buildings, and the landlords themselves come to take an interest in the matter, there is little chance of such erections becoming general. Nay, we must first be contented with the bare necessities which constitute a comfortable homestead, and consider that a great luxury, when compared with many of the miserable farmyards which in many districts still disgrace the agriculture of the present day.

These remarks, Mr. Editor, I beg to submit to your readers, through the medium of your most valuable paper; and, as I doubt not but much better plans may be suggested, and that the one I have attempted to put forth is open to many objections, I should be most happy to have the opinion of some of your more intelligent readers on the subject, as I feel convinced that it is a matter in which something requires to be done; and if this can in any way accomplish the object, it would very much gratify

Your most obedient servant,

W. A.

## THE NEW CATTLE-MARKET OF LONDON.

For about a year and a-half, old Smithfield, with its seven acres of stalls, sties, and sheep-pens, which have been so long an abomination in the eyes of living Londoners, has surrendered its uproarious existence, and subsided into a dry dull desert, cheerless and voiceless. That border-land of tap-rooms and toppers, of early breakfast-houses and drowsy drovers, of harness-makers, whip-makers, sack-makers, and dealers in smock-frocks and wide-awakes, and plushy red waistcoats, and boots and Bluchers an inch thick in the sole, and studded with a pound or two of iron—that archipelago of snug trading islets in a sea of mud, which begirt the over-crammed mart—has suffered a change almost amounting to dissolution, and is about to vanish in toto, like the morning mist at the rising of the sun. Bluff old Smithfield has walked off bodily to a country-seat in the suburbs, and has squatted himself down for a perpetuity in what but a few short summers ago was pleasant Copenhagen Fields. There, where cricketers held holiday, and pitched their milk-white tents in the sun—where once poor Hazlitt was wont to resort, to liquidate his stagnant bile with a game at rackets—where nursemaids handled their babies, and boys flew their kites, and Cockney sportsmen made their first essays with gunpowder—

there the green grass turf has given place to a floor of solid granite; the waving elms that overshadowed the white walls of the rustic inn are supplanted by a forest of stumpy sheep-pens; and monster-hotels, and long and lofty sheds, and a tall central clock-tower, rising in the midst of a low polygon-shaped mass of buildings, proclaim the new habitat of the London Cattle-market.

The new market occupies, if we may trust to such measurement as we can make with the eye, about twenty acres of ground, and is therefore about three times as large as old Smithfield; but the corporation, whose property it is, have secured land enough almost to double its present extent: and to whatever objections it may be open, want of space, for centuries to come, is not likely to be one of them. It is bounded on the north by the open fields towards Highgate; on the south, by a rapidly rising suburb lying between Islington and Camden Town; on the east, by the Caledonian Road, in which stands the Model Prison of Pentonville; and on the west, by Maiden Lane, which is undergoing a transformation into "The York Road." It is evident at a glance at the new undertaking, that the two things which have been especially studied in carrying it out are—convenience and permanence. To obtain these ends, the most lavish expense has been incurred. The whole of the soil was burned to the depth of several feet into a mass

of red brick ballast, before the building operations commenced; and we shall not readily forget the wild, savage, and fearful scene which the whole district presented, when it was studded with a hundred flaming and smoking volcanoes while this preliminary process was going on. On this fire-baked scoriae was laid the granite pavement, and into that were deeply imbedded the iron pillars that form the rails and pens, the horizontal bars alone being of kyanized oak. The stone-work throughout is of corresponding mass and strength; and the same may be said of the brick buildings within the walls, which serve as hotels and public-houses, and which are leased to the old landlords of Smithfield. The market is crossed by a broad carriage-road, running east and west. The ground to the north of this road is alone devoted to the sale of cattle and sheep—that on the south being taken up with open sheds and lairs. Besides these, there are slaughter-houses, and the conveniences for a meat market.

It is just about the glimmer of dawn, on a Monday morning late in October, when we approach the new Cattle-market, for the purpose of making a few observations on the mode in which the business is now conducted as compared with what it was in old Smithfield. The bleating, lowing, squeaking, and murmur of the market, pierces through the fog, and gives us note of its whereabouts at a quarter of a mile's distance, while yet the high buildings and the clock tower are buried from sight in the mist. We are soon, however, in the midst of the tumult, and find ourselves involuntarily congratulating both the beasts and their masters on the altered state of affairs. The first thing that strikes us is the superior accommodation for the oxen, and the utter impossibility that for long years to come such a cruel and disgraceful spectacle as a "ring-drove" will annoy the visitor. The stalls for the oxen are ranged in long alleys, each bearing a number in legible characters; the alleys are of the width of an average mail-coach road, and they are entered from roads still wider. The beasts are tethered to the rails by the head on both sides of the alley, and between each row there is double the space left free for passengers. They low plaintively in answer to one another, but we hear none of that painful bellowing which used to distress us; and, better still, we miss that incessant sound of blows, which made such devilish music in the old market.

Proceeding northward we come upon the sheep-pens, which we find not so well contrived in their space. They seem to differ very little from the old Smithfield pens; and many of them are shamefully crammed with sheep, forced in by the dog and the goad, until some of them are literally unable to touch the ground, being borne up on the backs of others. We suspect, from what we can see, that this is owing to the penny-wise conduct of the man who has them in charge, and who prefers torturing the poor animals to disbursing the hire of an additional pen. In the old market he would have huddled these unfortunates together as an "off-drove" in a neighbouring street, and transferred them to the pens as fast as he made vacancies for them by the sale of others—a manoeuvre he cannot practise here. It ought to be a regulation of the market, that a sheep-pen should receive no more than it can humanely accommodate.

In the new market, the calves and the pigs, by a regulation in their favour, have the benefit of roomy pens, comfortably roofed in from the weather. On the basements of the pillars that support the roofs of the sheds, their portraits are cunningly sculptured—an honour which has not been awarded to the oxen and sheep. The swine have been the objects of further consideration, in that the flooring of their sties presents a steeply inclined plane—a plan of which the matrons among them with large families show their decided approval by uniformly reclining at full length, with their noses at an elevation of some twenty degrees. Each sty is furnished with a grating covering a drain, a provision which goes far towards maintaining cleanliness. We find the swinish multitude on this occasion forming a very small minority, and, like most minorities, they are in violent opposition, and make more clamour than all the concurrents. Their example is not followed by the calves, which do not seem to know what to make of it, and await in silence the solution of the mystery.

Approaching the great polygon from which rises the tall clock-tower, we find it to consist of a circular group of offices and shops, in one central spot, devoted to the transaction of the business of the market. There are three offices for inquiry, belonging to the principal railway-companies; there is the electric telegraph office, in communication with all parts of the kingdom; there are no less than six banks for the payment of moneys and settlement of accounts: there is a shop for the sale of cattle medicines and drugs, and another for the sale of all articles for which there is likely to be a demand in the market, such as rugs, wrappers, horsecloths, over-coats, leggings, spatterdashies, brogues, fleams, knives, and reddle and colouring matter for the marking of sheep. In the midst of all these various marts, there is the office of the clerk of the market, who is the authority on the spot for the consultation or appeal in all matters where the interest of the Corporation is concerned, and who has the whole business, in a manner, under his control. For the satisfaction of the lieges, he exhibits on a board, at the entrance of his office, a notification of the state of the market from time to time. The state of the poll, as we pass by, happens to be as follows—beasts 5,367, sheep, 27,485—by which we know that to-day's market is considerably above the average, and that we need not therefore look for an immediate rise in the prices of beef and mutton.

A considerable influx of butchers' carts and traps has taken place while we have been making our rounds; they are ranged by hundreds in the hotel-yards, and their owners are doing business among the stalls and pens with a characteristic paucity of words and despatch of bargains. The beasts are coming in for a liberal allowance of punching and knuckling; and the sheep, invaded in their pens, submit to similar manipulation. When a butcher buys a beast—by which you are to understand an ox or a cow—he whips out a pair of scissors, and cuts his particular hieroglyph on the hide; when he buys a number of sheep, he has them marked with his signature or monogram by means of a ball of reddle. Some of these devices are exceedingly complicated, and cover the entire back of the animal, while others are a mere touch of the red mixture on a particular spot. Where so many thousands of sheep are sold in a few hours, it is expedient that they should be marked so as to be easily distinguished when claimed; and it would appear that the ingenuity of the buyer has been taxed to the utmost limit to effect this object. The pigs appear to be spared that familiar manipulation applied to their neighbours; it is thought enough to stir them up with a stout stick, or to trot them out of their sties and in again, to afford an opportunity for a fair view.

It is the law of the market that payments cannot be made from hand to hand between buyer and seller, but only through a market-banker. When a butcher has concluded his purchases, therefore, he repairs with the salesman to the office of one of the bankers, who makes out an account of the transaction, adding to it the market-tolls, the salesman's commission, and his own, or banker's commission. These items increase the cost of a beast to a purchaser by the sum of 4s. 4d., and that of a score of sheep by from 12s. to 15s. The banker's charge is moderate, being 8d. per beast, and 1s. 4d. per score of sheep. Ready-money is the order of the day; but the bankers occasionally make advances for the convenience of their customers.

When the butcher has settled his account, he receives an order for the delivery of the animals. He can give the order to his own man-servant, or can hand it over to one of the licensed drovers, of whom there are in London nearly 1,000 connected with the market. The driver knows where to find the animals, and he knows, too, his employer's mark; and in a few minutes he will have the morning's purchase clear of the market and on its way to the abattoir in town.

For the convenience of butchers attending the market, there are omnibuses that run from the city at an early hour to one of the market hotels, and there is a special carriage attached to the trains of the North London Railway, which stops at a station very near. There is no lack of inns and public-houses in the market itself; and in the immediate neighbourhood, on the north-western side, there is rapidly coming into being the same characteristic border-land of coffee-shops, eating-houses, beer-shops, and appropriate trading-

establishments, whose disappearance from the old site we have referred to above.

Thus far our survey of the new Cattle-market is in all respects satisfactory and *couleur de rose*; but it has now to be looked at from another point of view, whence we shall not find its aspect so pleasing. In the first place, the intolerable nuisance which formed the grand objection to old Smithfield—namely, the enormous amount of cattle-driving in the public ways—is not obviated by the new market. Butchers assert that the cattle-driving has increased; and, looking to the fact that large numbers of both oxen and sheep are driven through the city from the south, east, and west, to arrive at the market, and have to be driven back again after sale, their assertion is probably true. Of the foreign cattle, the major part are landed in the neighbourhood of the Westminster Docks, and have to traverse a crowded mass of narrow city thoroughfares and suburban by-roads before they can reach the market, lying nearly four miles off. Considerable numbers also come by way of White-chapel from the south, traversing six or more miles of streets ere they reach the place of sale. The proportion of these that are again driven south and east after sale is the same as it used to be—with this difference, that they have twice as far to go. What is saved by the nearness of the market to those coming to town from the north is but a partial compensation, because the drovers continue to patrolise the old lairs—driving the animals into the suburbs on the Saturday, and retracing their steps to the market about midnight on the Sunday. In one respect the driving nuisance is ameliorated, inasmuch as the droves leaving the new market enter the city by more various and more commodious routes than those debouching into Smithfield, and are at once spread over a larger surface. The inhabitants of the quiet genteel districts which formerly lay out of the cattle-driving track were at first indignant at the innovation, and not without reason. If a gentleman floriculturist left his gate open, or the early milkman, when he deposited his matutinal tin-can under the scraper, by virtue of an agreement with the drowsy housemaid, left it open for him, it happened more than once that he was awakened by the rush of a score or two of sheep into his greenhouse; or, on looking out of window to ascertain the cause of the tumult, beheld a grove of fashionable fuchsias vanishing down the throats of a party of shorthorns. Mrs. Grundy flew into a passion, and out of the neighbourhood; declaring that it was perfectly *preposterous* to attempt to force the poor dumb creatures to travel by a cross route after they had been used to the main road, to her knowledge, for the last twenty years at least! Other people did the same; and there is no doubt that one effect of the opening of the new market has been the depreciation of a certain class of house-property in the channels leading to it, and the stoppage of a definite style of house-building in its near neighbourhood. It was anticipated, while the new market was in course of formation, that a considerable proportion at least of the animals there sold would have been taken no further; and convenient abattoirs were therefore erected, available at very moderate fees—and space was also allotted for a meat market. That anticipation has proved all but a chimera. The reason is obvious: the dead weight of meat to be conveyed from Copenhagen Fields to the various parts of the city—some of it to a distance of seven miles and more—would hardly be less than 4,000 tons weekly; and we cannot expect that, so long as this vast weight is allowed to walk through the city alive, the butchers will voluntarily incur the expense of its transport as inert matter. The only means of putting an end to cattle-driving in the streets would be by the peremptory interference of the legislature with a decree resembling that of Napoleon, who nearly fifty years ago forbade the appearance of a single ox, sheep, or pig in the streets of Paris under penalty of forfeiture. Such a law would probably necessitate the establishment of an additional new market on the southern side, and it would un-

doubtedly increase sensibly the price of meat to the consumer.

Another grand objection against old Smithfield was the cruelty to which, in various ways, the poor animals were subjected. We have seen that some of these cruelties are not practised, or, indeed, practicable in the new market. Off-droves and ring-droves are abolished, and not likely to be resuscitated on an area which has already accommodations for 7000 beasts, 35,000 sheep, 1,500 calves, and 1,000 swine, and which is capable, if need arise, of doubling its accommodations. Yet we have seen the pens overloaded with sheep, and crammed to suffocation, and been outraged and disgusted by the unnecessary use of the goad in the hands of the drovers. The worst evil, however—and a cruel evil it is—is the want of water, of which the unfortunate sheep are mainly the victims. The beasts, after their long journey by road or rail, do get a little water at the lairs, and sometimes a wisp of hay; but the sheep get nothing. It is easy to see, as they pant along the road, that they are in a fever of thirst; and by the time they are driven into their Monday morning pens, the majority of them are gasping for breath. Immense flocks of them neither taste grass nor water from the time they leave their pastures to the moment of their death—a period varying from two to four days. The barbarity of such treatment is disgracefully apparent; but the subject is full of difficulties, and the remedy not easy of invention or application.

Talking the matter over with a humane dealer, who has frequented the cattle-market for nearly thirty years, we urged as strongly as we could, on the score of humanity, the poor sheep's claim for water, and expressed our surprise that no provision was made for watering them in the market.

"I acknowledge that it is a bad and miserable thing," he said, "but what are you to do? They come to town in such a state of thirst, that we dare not let them drink. You can't take twenty or thirty thousand sheep, and hand them 'glasses round,' or as much as would quench their thirst and do them good. The only way to water them at all is to drive them to a pond; and if you do that, as sure as you are alive, they'll drink till they kill themselves. I've seen it tried. You can't get them away from the water; not with dogs or sticks, or anything else—they'll drink and drink till they drop, but they won't come out. I tell you, I've seen it myself."

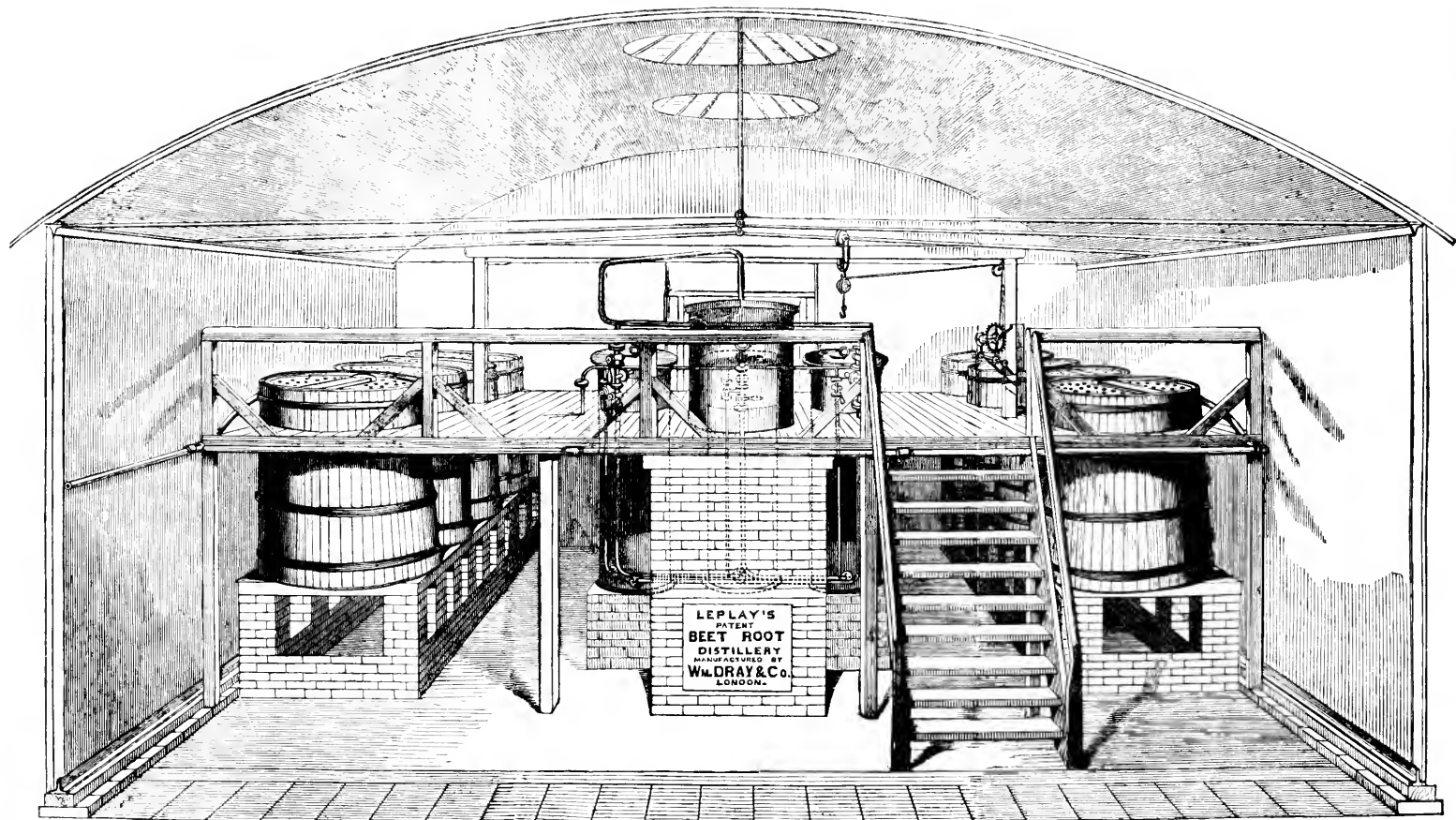
We suggested the practicability of some contrivance by which a sufficient quantity of water might be turned into a shallow basin, and allowed to be drained dry by a certain number at a time.

He allowed that such a thing might be done, but shook his head significantly, and changed the subject. We cannot believe but that measures might be taken to avoid the perpetration of such barbarity as our friend's statement of the matter points out. It seems to us that the graziers and breeders would but forward their own interest in devising the means of sending their animals to market in a healthy and comfortable condition. It has been stated that a loss of not less than ten per cent. is suffered by the owners of sheep, as a consequence of the condition in which the average of them arrive at the market. Surely that is more than a sufficient amount to pay for reasonable care in their transport, and the supply of such food and water by the route as would prevent at once their sufferings and their decrease in value. But the proprietors of the animals must look to this business themselves, and not delegate it to the drovers, whom long habit has reconciled to the old state of things.

We have only to mention, in conclusion, that the horse-dealing is confined to the Friday's market; that the hay-market is still carried on in old Smithfield; and that the commission on the sale of all animals is a trifle heavier in the new market than it was in the old.—*Chambers' Journal*.



THE NEW AGRICULTURAL DISTILLERY, ERECTED AT MR. DRAY'S FARM, FARNINGHAM,  
NEAR DARTFORD, KENT.—(For description see page 215.)



LEPLAY'S  
PATENT  
BEET ROOT  
DISTILLERY  
MANUFACTURED BY  
W. DRAY & CO.  
LONDON.



## AGRICULTURAL DISTILLERIES.—DISTILLATION FROM BEET.

Very numerous now are the signs and tokens around us, indicating that a great revolution in public opinion with reference to agriculture is about to take place. Not far distant surely is the time when this science—if, indeed, some will admit that is worthy of the title, whose existence is scarcely recognized by our legislature, whose efforts are sneered at by the great bulk of the people, and which by a large and influential "school" has been persistently put in the background as altogether behind the improving capabilities of the age—will assert by the energy, the scientific knowledge, and the business tact of its followers, its right to be considered as the most important of all the sciences, the "mother of all the arts."

Every day witnesses the introduction of a new power or process, still further to reduce the cost of working, or to increase the products of the farm; and no sooner is one "innovation" brought forward than another still more opposed to preconceived notions starts up, demanding the attention of the farmer, and offering him its aid. Now called upon to substitute for the "tired reaper's sounding strokes" the regular beat and untiring energy of the "machine reaper;" anon he is summoned to be told that the days of the "plough"—the time-honoured instrument, the very synonym of his calling—are numbered, and that soon the "plough-boy's whistle" will be drowned in the puff and snort of the steam-engine; and now, while the agriculturist of the old school is wondering what all these "innovations" mean, and shakes his head doubtfully and ruefully at the evils he fancies they portend, and is apt to smile at the notion that *physiology, geology, chemistry, or mechanics* can be of any use to him, or enable him to rear one ear of wheat the more, he shakes his jolly sides with laughter when asked—O, shades of his broad-bottomed ancestors!—to become a *distiller*, and this in order that he may become a better *farmer*. Not very clear, doubtless, at the first blush of the matter, is the connection between the duties of these two very diverse, or apparently diverse callings; but should the reader give us his attention for a short time, we hope to be able to prove to him that there is a close connection between them, and that the question of "farmyard distillation," bids fair to become one of the most important of the day, involving as it does the very essence or spirit of agriculture—increased production of manure, and increased production of human food. We are not ignorant of the objections which have been and are now made to the "cultivation of beet;" but not now to enter into the discussion of this point, we simply state that the opinions *contra* have been given without due consideration of all the details of the question; and that the objections have been presented to the public with greater persistency than the points in favour of the cultivation. But of this more hereafter—we hasten now to describe the important process which forms the subject of our paper. And this we propose to do under the heads "historical," "mechanical," "operative," "commercial," and "cultural."

1. *Historical*: The cultivation of beet, with a view to use it as a medium from which to obtain sugar and alcohol, is by no means a recent matter. So far back as 1747, Marghoff, a celebrated German chemist, published a report of his investigations as to the amount of sugar contained in the beet; and in 1796 Orchard commenced at Comorn, in Silesia, the practical manufac-

ture of beet-root sugar. Again, with reference to the production of alcohol from this root, the Count Chaptal, in 1812, directed attention to the advantages of the distillation; and in 1825 M. Dubrunfaut seriously engaged a number of enterprising farmers and distillers to attempt the distillation of beet. "As the births," says Bacon, "of living creatures at first are ill-shapen, so are all innovations which are the births of time," this holding true of the above processes, for it was long ere improvements were made which rendered them commercially valuable. From a period shortly following the inauguration of Napoleon's celebrated "continental system," by means of which he hoped to shut out from France all the commerce of this country, up till now, a variety of improvements have been from time to time introduced in beet-sugar manufacture, which have resulted in bringing it to a pitch of comparative perfection, and in reducing the cost from the almost fabulous price of £1,600 for a single loaf—which sum the first loaf manufactured for Napoleon is said to have cost—down to a price which places it in favourable competition with the best of colonial produce.

The same improvement has characterized the distillation of beet. It was only in 1852 that the manufacture was established on a great scale, and yet so rapid has been its progress, that with a value in the above year of only £20,000, it reached the last year to the large amount of £2,000,000.

For an account of the most celebrated systems of distillation, we refer the reader to the interesting pamphlet as under\*, proceeding to describe the "mechanical" arrangements of that system invented by M. Lepage, which is now being introduced under the spirited auspices of Messrs. Dray and Co., Swan Lane, London, and of which a very complete example in full working order is thrown open for the inspection of the public at Mr. Dray's farm at Farningham, near Dartford, Kent.

2. *Mechanical*: The mechanical arrangements necessary to carry out the process are amazingly simple, and present a marked contrast to the complicated details of ordinary distilling apparatus. After a close inspection, we apprehend that no difficulty will arise in its management under the superintendence of an intelligent farmer, with the assistance usually obtained in agricultural districts. The apparatus at work upon Mr. Dray's farm may be described under four heads—washing, slicing, fermenting, and distilling. It is capable of distilling 5 tons of beet in the 24 hours.

The *washing machine* is of the usual simple construction, the revolving cage being *driven* by the four-horse power engine. It is capable of washing 160lbs. of roots in five minutes. The roots are put in at one end of the machine, and passed out at the other, thoroughly cleaned, ready for the *slicing operation*. This is performed by one of Barnard and Bishop's root-slicer; the rate of working of which is found best

\* "The Agricultural Distillers' Hand-book: the Method of Distilling from Beet-root." A short notice on the production of neutral spirit from beet, mangold wurzel, carrots, Jerusalem artichokes, &c., as successfully practised on the Continent, and now permitted in England by Act of Parliament. By a Practical Farmer and Distiller. G. T. Thomason, Thames-street. 1s.

when making 80 revolutions per minute. It is of importance to regulate the speed of the "slicer," in order to obtain that peculiar form of slice which experience has shown to be best adapted to the process. The form desiderated is such as to allow of the formation of interstices or spaces between the slices, when the latter are laid in layers in the fermenting vats; and through which spaces the steam should have a uniform passage, so as to completely surround the slices when laid on the plates of the distilling cylinder: when the slices are too thin, the distillation is difficult to effect, and when too thick, the fermentation proceeds slowly. With a breadth of slice of from 1 in. to 1½ in., and a thickness of from ½ to ¾ in.—length immaterial—the processes of fermentation and distillation go on with precision. The root-washer is set to work one hour and a-half before the slicer, to make up for the difference of time required by the former to perform its work.

The "slicer" is capable of cutting three-quarters of a ton in the half-hour. The slices thus obtained are carried to the fermenting vat in baskets, lined with iron or zinc; 42 of which fill the vat in half an hour.

*Fermentation* is carried on in vats capable of holding from 230 to 300 gallons of juice, and three-quarters of a ton of beet, or 42 baskets. For a five-ton-per-day apparatus eight of these vats or tanks are required. These tanks communicate with the boiler of the engine by means of pipes, provided with taps; by which the current of steam passing in can be easily regulated.

The cover of each tank is supported on a ledge, placed at such a distance as to allow of a space of eight inches between the top of cover and upper ledge of vat. The cover is in two parts, which are pierced with apertures, 1½ in. in diameter, and are firmly kept down by means of iron bars. These precautions are necessary, to prevent the beet being forced out of contact with the fermenting liquor through the formation of the carbonic acid gas. In the arrangement adopted at Mr. Dray's farm, four of these vats are distributed at each side of the wall of the building, the distilling cylinders being placed between them. As the vats and cylinders are of considerable elevation, a gangway is raised, the level of which is a little below that of their upper ends: this is reached by a flight of stairs from the main floor of the building, in which the steam-engine washing and slicing apparatus are placed.

The *distilling cylinders* are three in number, and of cast-iron; they are provided with covers, which fit into an inside rim or ledge, lined with india-rubber or tin, and are firmly bolted down when the cylinders are filled with the beet. Each cover is provided with a small safety-valve, which opens at a pressure a little above that of the atmosphere; this pressure being sufficient, distillation being better effected with a low than a high pressure.

To allow of the complete permeation of the steam through the slices of beet, these are not placed *en masse* in the interior of the cylinder, but are supported on plates or diaphragms made of zinc or galvanized iron, punctured with apertures, which should not exceed half an inch in diameter, uniformly distributed on the surface. Of these plates, of which there are ten in each cylinder, nine only are filled; the last, or uppermost, being empty, to let the steam escape easily to the "refrigerator." Each is provided with a hollow boss, which slides on to a central bar, fixed vertically in the double bottom of the cylinder, and which extends nearly to the top. The depth of the hollow boss is such as to allow of a space of eight or ten inches to be left between each plate, the uppermost plate resting on the upper edge of the boss of the plate beneath. The first plate is supported on the central bar at a distance from the bottom of the cylinder equal to one-

fifth, or rather one-quarter, of the diameter. The space thus left contains the water of condensation and that of drainage, arising from the first part of the process of distillation. The first products contain a small per-centage of alcohol, which is extracted by conveying part of the steam through a perforated pipe, by which it is carried into the liquid. The residual water is conveyed from the cylinder by means of a discharge-tap; this being placed at a higher level than the pipe admitting steam from the boiler. By this arrangement the force of the steam is moderated before passing through the beet. Communication is effected between the steam-boiler and the cylinder, and these and the refrigerator or "still," by a series of pipes provided with taps, by opening and closing which the passage of the steam can be cut off from any one cylinder, or from the still, as desired.

The plates, when filled, are raised and lowered by means of simple sliding tackle, suspended from a beam passing over the centres of the cylinders provided at one end with a small windlass or winch. The upper part of each plate is provided with projections, which are laid hold of by a double hook supported by the tackle. The refrigerator, or still, is placed in a vertical tank, a little in advance of the cylinder, and opposite the central one. The tank is constantly supplied with cold water, the water, as it warms through the condensation of the steam, passing off by a waste-pipe.

Having thus briefly glanced at the mechanical arrangements, we now proceed to describe the *operative* part of the process. Of this department the important feature is the fermentation.

The first care of the "distiller" is to obtain a good fermenting liquor or "wine." For this purpose the juice of the beet itself is preferable. To commence the preparation of this liquid *de novo*: the beet-slices are macerated in a vat with water raised by steam to a temperature of 145° Fahrenheit, or water acidulated with sulphuric or other powerful acid. When the tank or vat is completely filled, the contents are stirred up from time to time, and are then left to macerate for four hours after; at the expiry of which time five pounds of compressed beer-yeast, or four-and-a-half quarts of liquid yeast, are added, and well mixed with the mass. The first distillation of the beet thus fermented is very weak; but, as the liquid in the vats becomes saturated with the juice of the beet, the strength is increased, and when the liquid is of the same character (that is, contains as much alcohol as the beet-slices put amongst it), these no longer part with their alcohol, but are passed to the cylinders in the best condition for the production of strong alcohol. The working of the little wine "Vinnase" or wort takes up about a fortnight, during which time every successive filling of the beet parts with so much of its alcohol as above stated to the liquid in the vat. It must not be supposed, however, that there is thus any actual loss; as after the completion of the distilling season (which lasts five or six months), the wort may be passed through the still, and made into alcohol. It will thus be seen that the first point to be attended to is to obtain a good fermenting juice or wine. This, once obtained, is capable of carrying on the fermentation of successive "fillings" of beet-slices for an indefinite time, and can be kept in good condition for weeks; the only precaution to be taken, where it is desired to be retained, when the distilling process is stopped, is to keep the vats in which the liquid remains filled with beet-slices. On recommencing work, this beet should be taken out and distilled, and 1½ lbs. of yeast added to the liquid in the vat; when fresh slices are added, the fermentation will

proceed properly. Where the liquid is left alone in the vats, it soon becomes mildewed. Although the juice of the beet itself makes the best liquid or "wine," it is proper to note that "all liquid submitted to good alcoholic fermentation, produced by proper means, may serve for an indefinite period for the alcoholic transformation of slices of beet."

A supply of good fermenting liquid being obtained in the vats, let us trace as briefly as possible the succeeding process.

To obtain a good fermentation, the proportion maintained between the liquid and beet slices should be one part of the latter to two of the former. The slices are conveyed, as before stated, from the root-slicer to the vat, in baskets, 42 of which are required to fill it. As the slices are discharged into the vat, a certain quantity of acid—as sulphuric—is added to the mixture from time to time. The quantity of acid cannot be stated with precision, depending as it does on a variety of circumstances, as the quality of the beet, the soil on which it grows, or the time of the year at which the distillation is carried on. It is, however, a comparatively easy matter to determine the quantity to be used; an average allowance being rather less than half a gallon, or three and a-half pints to a ton of beet. This should be divided into three portions, and added to the contents of the tank at three different times, so that a third of the acid shall be put in with a third of the beet. Previous to putting the acid in the tank it should be diluted with water or fermented liquid from the tank, in the proportion of one-tenth acid to nine-tenths liquid. This prevents the action of the concentrated acid on the slices of beet, and facilitates the uniform spread of the acid in the liquor; a rake being used to stir the contents.

The tank being thus filled, its contents must be kept up by means of the steam admitted from the boiler, at a temperature from 77 deg. to 82 deg. 40 min. Fah.; a temperature superior to the latter would have an injurious tendency, preventing the proper fermentation of the beet, and diminishing the preserving powers of the "wine" or fermented liquid. To have the temperature of the mass as uniform as possible, it should be continually stirred.

On the proper temperature being attained, the mixture is fermented by mixing intimately with it a liquid composed of five pounds of compressed beer yeast, or four and a-half quarts of liquid yeast, obtained in breweries, and a small quantity of the liquid or fermenting juice of one tank. This is thrown into and well stirred up with the contents of the tank. The cover is then placed on the tank; fermentation commences rapidly, the liquor bubbles through the holes, which also serve as escapes for the carbonic acid gas generated. In three or four and twenty hours the fermentation ceases, and the liquor ceases working and diminishes in volume.

The beet, now ready to be distilled, is taken from the tanks, one-half only of the cover being taken off. The slices are lifted out by a shovel in the first instance, and placed in a basket which stands on the half of the cover still left on. The liquid drains from those baskets, running again into the tank. When comparatively well drained, the slices are put into another basket lined with zinc, &c., and carried to the cylinder in which they are to be placed. As the slices in the tank decrease in number, a landing net is substituted for the shovel, for lifting them out into the basket. It is not necessary to take out every part of the beet: no harm results from a portion remaining; but to keep up the regularity of the process it is as well to completely clear the tank of its contents.

The quantity of beet by the process of fermentation is reduced in bulk to the extent of one-seventh, so that

the beet originally taken to the vat, amounting to 42, is reduced to 36 baskets, these being distributed to the cylinders in the proportion of four baskets to one plate or diaphragm.

When the vat is filled the second time, the process gone through is exactly similar to that above described, with this exception, that the quantity of yeast used is reduced one-half; this holding good also for the third filling; while in *succeeding fillings the yeast is entire ly dispensed with.*

The steam used for raising the temperature, in process of time also raises the bulk or quantity of the contents of the vat. This, when in excess, is poured into the cylinder and distilled; care being taken not to have the cylinder more than half full.

The process thus introduced by M. Leplay, has for its object a perfect fermentation of the beet, without boiling or extracting the juice by pressure or otherwise; the result being that the alcohol enters the place of the saccharine in the beet. This alcohol is extracted by causing a jet of steam to pass through the mass of beet slices placed in the interior of the cylinder, in the method already described. The alcohol is thus freed without causing the slices to lose their form.

In filling the beet on the plates or diaphragms, great care is requisite to place them as level and uniform in depth as possible. When all the plates are filled and passed to their relative positions on the central bars of the cylinders, the covers are bolted down; and the taps communicating with the pipe leading to the "still" and the interior of the cylinders opened. The steam pipe communicating with the upper part of No. 3 to the lower point of No. 1 is then opened. The process should be so arranged that the steam from the top of No. 1 should pass to the "still" three-quarters of an hour after the steam pipe is opened, as described above. The spirit then begins to run over-proof, its strength gradually decreasing, till at the expiration of forty-five minutes it runs over below proof. During the distillation of No. 1, No. 2 cylinder is filled with beet, and the cover bolted on. When the spirit running from No. 1 is reduced to 20 degrees below proof, the communication between the top of No. 1 and the bottom of No. 2 is opened, and that also from the top of No. 2 to the condenser; that from the top of No. 1 to the condenser being, of course, also closed. Cylinders No. 1 and 2 are thus in communication, and the steam from No. 2 passes in time to the condenser, giving the same result of spirit as obtained from No. 1.

As to the time absorbed in the process from the taking of the beet from the vat to the finishing of the distillation, the following "notes" taken during our visit may be of some interest. One man fills the basket, one works the crane, and one fills the plates of the cylinders with the slices. To fill one cylinder—that is nine plates, using thirty-six baskets—including the putting on of the cover, takes ten minutes; to empty the same, after distillation, about two minutes. No. 1 cylinder is exhausted in one hour and a-half; No. 2 in the same period. Ninety gallons per day should be the produce of the three cylinders, five tons of beet being used.

We now come to the next division of our subject—the "commercial" features of the process. The two products are the alcohol, and the residuum, which latter possesses a high value as a feeding material. And first, as to the alcohol produced. The amount of this is necessarily dependent upon the per-centage of sugar contained in the root; and this, as all our readers know, varies much. On this point we propose to offer a few notes under the last division of our subject, proceeding now to observe, that in the system of distillation introduced by M. Leplay, a ton of white Silesian beet will produce five per cent. of pure alcohol at 100

degrees of strength of Gay Lussac, which is equal to fifty litres, or, at a rough calculation, eleven gallons of our measure. But as proof in England is only 56, fifty litres at 100 degrees will be equal to eighty-seven litres at 56; or say equal to nineteen and three-quarters gallons of proofspirit. Twenty-five tons of white Silesian beet should be the average crop per acre; this gives, therefore, 493 gallons of proof spirits as the produce of an acre of beet, or a produce nearly three times that of an acre of barley of first quality. Taking the price per gallon (without excise duties) at 3s., this gives a pecuniary result of £73 19s. per acre. Nor is this all; the value of the feeding material remains yet to be taken into account. After distillation, the slices are in France termed *cossets*; these form 70 per cent. of the original beet. These have the property of remaining one or two years in a state of the most perfect preservation, either stored in pits underground, drained at the bottom, or banked up in earth in the manner followed for potatoes. The bulk of the cossets, after being drained and lying for some months, is reduced one-half. The result of a series of careful and long-continued analyses and experiments, the inventor states, goes to prove that 90 per cent. of the "primitive nutriment contained in the beet-root" is retained. This gives the farmer nearly twenty-two tons of nutritive feeding matter, after producing 493 gallons of proof spirit from the twenty-five tons of beet. "The fermentation of the slices of saccharine roots in a juice saturated with its own elements has the effect of leaving in the root its azotic, nutritive, and other valuable principles, and changing into alcohol the saccharine matter only. The nutritive azotic matter, being essentially fixed by the process of fermentation and heat, is found solidified and coagulated in the slices during the fermentation and distillation, and is thus insoluble in water."

We regret that space does not allow us to go as fully as we should like into the details of experiments instituted to establish the value of the cossets as feeding material. M. Didier, of Cuiry l'ouise, in the Soissonais, in France, carried out a set of careful experiments, of which we can only give the results, referring the reader for ample details to the pamphlet already alluded to. "By substituting the residue of distilled beet-root for good hay, estimating the hay at 2s. 6d. per cwt.—a very low price—and valuing the residue at 10s. per ton, he saved 2d. per day in the food, and increased the weight of his oxen by 17 lbs. in thirty days. By increasing the cossets 10 lbs. and lucerne 11 lbs., M. Didier had a still more decided result; for in ten days the increase was 108, or upwards of 1½ lbs. per day; while in the last experiment quoted, the increase in weight was equal to half a pound per day only. In the latter experiment, the cattle worked seven hours per day. The result of M. Didier's experiments convinced him that with no other kind of food had he ever found a greater increase in the weight of the cattle than that mentioned in the last experiment."

As far as regards the paying capabilities of the system, the following account of a distillery in France may be interesting and suggestive. "The beet grew on 420 acres of fair land, with a mixture in the soil of marl and limestone. The season was from October, 1855, to April, 1856:—

	£	s.	d.
8,369 tons of beet at £1 per ton . . . . .	8,369	0	0
1,163 tons of coal at £1 per ton . . . . .	1,163	0	0
Labour and assistance . . . . .	470	0	0
Sulphuric acid, 36 tons 15 cwt., at £8 per ton . . . . .	294	2	0
Yeast . . . . .	18	0	0
	<hr/>		
	£10,314	2	0

Produce 166,978 gallons of spirits, at 3s. per gallon, equal to £25,046, leaving a profit, after deducting the above expenses, of £14,732. But another source of revenue remained in the cossets, which yielded 10s. per ton, the farmers carting them home a distance of five miles. It was the extremely favourable result of the working of this distillery that induced the inventor and his friends to turn their attention to England, with a view to introduce the process amongst our agriculturists.

Having thus glanced at the commercial, we now hasten to attend to the "cultural" features connected with the process—forming the last division of our paper.

Contrary to the opinion already adverted to, that the beet-crop is an exhaustive one, all experience has shown that, where it has been properly carried out, it has invariably been the reverse. "It completely revolutionizes agriculture," says a good authority; "for its existence in a district is perfectly incompatible with imperfect tillage." Wherever, from whatever causes, the cultivation of beet-root is extended, "people learn the value of manures, the science of capital applied to agriculture." It is a poor objection to the crop to say "that, in taking the roots off the farm, the value of the land is deteriorated, so much manure being carried off." The same may be said of many other crops. But the fault lies not with the crop, but with the farmer, who thus deteriorates his land. What is taken from it should be returned to it; and whether the process for which the beet is required is that of sugar-making or distilling, every facility is thrown in the way of this "return" being effected, should the farmer be disposed to avail himself of these facilities. If he does not feel disposed, it is clearly his own fault; and the crop cannot, in fairness, be charged with being a deteriorative one. But we have said that all experience has shown that the cultivation of beet for manufacturing purposes has had a marked influence on the extension of scientific agriculture; and on this point a few corroborative quotations may be suggestive:—"The Society of Agriculture of Valenciennes, consulted in 1850 by the Commission of Inquiry of the 'Assemblée Nationale' upon the state of agriculture in the district, answered that all the progress since 1832 was owing to beet-root. Before 1832, the average production of wheat was 250,000 hectolitres. Since the establishment of sugar-works and distilleries, the annual harvest was 420,000 hectolitres. The average for the whole district is, to-day, 12 hectolitres per acre; whereas, before 1832, it was 8 hectolitres per acre." When, in 1828, the first sugar factory was erected in the district of St. Quentin, 11,000 head of cattle, and 70,000 head of sheep were fed on it. "In 1852, under the influence of beet-root distilleries, it fed 16,909 head of cattle, and 140,491 head of sheep." \* \* Before this new mode of agriculture, the northern departments knew nothing but the course of triennial farming—corn, forage, and fallow. After clover followed a fallow, because the soil was foul, and it was necessary before sowing corn to clear the ground of weeds. The introduction of beet-root, in getting rid of unproductive fallows, has rendered the soil firmer, and prevents the disastrous effect of storms. With better manure, and in greater quantity, it allows one course of triennial farming, which includes beet-root, corn, and forage. Thus beet-root may be produced alternately with corn every three years. The whole secret in growing beet consists in rendering to the soil what you take from it. This restitution takes place by consuming the pulp on the farm. To cultivate beet to sell, without buying the equivalent in pulps or residues, is ruining the soil, or, as we say in France, "killing the goose for the golden eggs." Now it is in view of the greater facilities

offered to the farmer to avoid this "killing of the goose" by the *distilling* process, that we think it is in every way more fitted for the wants of agriculture, and more likely to become generally introduced, than the sugar manufacture. Irrespective of the very important fact that the residues of Leplay's distilling process are *much more nutritive*, and will keep a *much longer time*, than the residues of the sugar manufacture, there are difficulties in carrying out the latter process, which are not met with in the former. While the sugar manufacture requires expensive machinery; and its complicated processes demand a large amount of patient attention and no small degree of chemical and operative skill on the part of the manufacturer, a very close inspection of the process of "distillation" now being introduced into England convinced us that there was little in the expensive character of the machinery, and marvellously little in its operative processes, to deter any farmer, with assistants of the average ability, from conducting the manufacture. We feel satisfied that any one giving a close and candid inspection to the process will join us in this opinion.

Some time ago we had occasion to investigate the question of beet-root sugar manufacture in Ireland, and after a pretty full inquiry, we came to the conclusion that, despite the manufacturing difficulties, the cultivation of beet in that country deserved to be generously encouraged, rather than lightly carped or quibbled at, or "dammed with faint praise," if praised at all; and this chiefly in view of the benefit which practical agriculture would derive from an extension of the crop, and the increased demand for labour it would create, which latter was then a more important consideration than it is now perhaps. Some of the difficulties attendant upon sugar manufacturing from beet we have already alluded to, as expensive machinery and complicated processes. Another difficulty, and what we felt was the greatest, we may here give in an extract from the report which we drew up on the subject: "Important as the subject is to the Irish farmer, it is clear, however, that the same problem is to be solved in connection with beet as that connected with flax—namely, suppose the cultivation to increase in any one season, its permanence will depend upon the demand for the produce in the proximity of the farm to the place where the manufacture is carried on." (*Journal of Agriculture*, No. 43. "Beet-root Cultivation;" *Blackwood*). Now it is obvious, we think, that in many of our rural districts this dependence of the farmer on the sugar manufacturer would be productive of great inconveniences. It is in every way a difficult matter to get a manufactory erected at the place most suitable for the farmer. Neither are their interests always so conjoined—as at first sight might appear to be the case—as to make the connection altogether a pleasant one. This junction of the interests of the farmer and the manufacturer has been a difficult point to be adjusted in the flax question, and it would be a still greater difficulty in the beet, as the latter is a perishable article, while the former is not. Still further, experience has shown that in the cultivation of beet the distiller and sugar manufacturer have an interest opposed to that of the farmer, inasmuch as the latter wishes to attain weight of crops, while the former wish a large percentage of sugar. *En passant*, we may note on this latter point, that we are aware a variety of opinions are held as to the comparative value of large and small roots, and we had hoped in this article to have gone slightly into the matter: this we find space will not allow, and must therefore reluctantly defer doing so to another opportunity.

To return. we think all these difficulties will be obviated when the producer of the root and the manufacturer of its products, alcoholic and residual, can be combined in one. This combination can be effected, we

think, to a large extent, by the adoption of some such process as that introduced by M. Leplay. We do not ignore the difficulties that lie in the way; but patience and perseverance will doubtless overcome them: the prize in view is clearly worth striving for. We doubt not but that "farm-yard distillation"—not M. Leplay's process in particular, but by whatever method carried out—will be gravely objected to by many; that many apparently cogent reasons will be brought forward to prove beyond the possibility of a doubt that it cannot possibly do—just as it was proved, and of course convincingly, that stage coaches would ruin the country; that canal aqueducts were "castles in the air;" that fast locomotives were the scheme of a madman; and telegraphs were myths which would never work. In view of the doubts and objections of many, the sneers possibly of some, it may be worth while glancing at what our French neighbours are now thinking about the matter. In a Report recently made to La Société Impériale et Centrale d'Agriculture, by a number of most eminent men, including the honoured name of Boussingault, the extension of root distillation is strongly recommended as "a part of the rural economy of France, because it increases manure, increases meat, and increases corn." In the *Illustrated London News* of Dec. 13th, 1856, in an article on the subject, the following extract from the Report is given, which will doubtless be interesting and suggestive to our readers: "The introduction of distillation on farms, especially with an agricultural object, is a recent fact. Exceptionally, the departments of the East, the neighbours of Germany, have instructed the people on the other side of the Rhine, and all the North of Europe, in establishing the distillation of spirits as the basis of their rural industry. We are only beginning to comprehend the true end of the distillation of roots. The production of spirit ought to be regarded as a subsidiary object; the essential aim and end of the distillation is to produce more abundantly, and at the same time more economically, meat and corn. The distillation of roots, we must repeat, in order to keep the true object of this industry in view, is a means of solving the chiefest problem, that in which art and science blend all their efforts—the production of manures. It helps the solution by enabling animals—our machine for supplying manure—to give it for nothing, which is a great progress—to give it with profit, and with ever-increasing profit, which is perfection."

It is impossible to give stronger or more authoritative evidence of the importance of the subject than this. We have no desire to place one patent or process before another; but in view of the high interest which the question possesses, we are anxious that the reader should investigate the matter for himself. At the same time we feel justified in directing attention to the process introduced by Messrs. Dray and Co., as possessing considerable claims to a fair and full inquiry as to its merits, not only on account of the comparative simplicity of the appliances required, but also from the ease with which the operation of distillation can be carried out.

If there is one thing which distinguishes the practical science of the day more than another, it is the efforts made by our chemists and mechanists to economize consumption of whatever kind, and to utilize the "waste"—or what have hitherto been waste—products, or refuse of various manufactures. In connexion with agriculture there can be no question that the consumption of our feeding-roots might be greatly lessened, and yet the results increased. When we enter the place where cooking food is carried on, the odoriferous steam which floats about, as it greets our nostrils, might hint to us that some improvement in its preparation might be effected. The too suggestive story, in this land of wealth, of the poor wretch who dined on the smell of

the cook-shop, is no more without its lesson to us as agriculturists than it is without its moral to us as men. What the latter is, we leave our readers—fresh from gazing on plethoric oxen and hogs incapable of motion, and from visions of prize-beef with all its delightful *et ceteras*—to guess at, if they can. What the lesson is we scarcely need the aid of chemistry to tell us. No longer to moisten rafters and a-raken bovine appetites need we allow the steam of our root-boilers to pass away; but with Leplay, let us, before cooking, ferment our roots, make steam our willing slave to do our bidding, and from the material evoke a spirit, literally and metaphorically, of some value—and find, as a reward for attending to the proverb “Waste not, want not,” the final result not to be quite unsatisfactory.

The variety of beet-root adapted for sugar manufacture and for distillation, is that known as the White Silesian or sugar beet. The system of preparing the land for mangel wurzel will do for this crop, with some modifications according to circumstances. The soil best adapted to the root is dry sand, or calcareous soil; the roots grown on the latter average more saccharine matter than those grown on sandy, clayey, or mixed soils. As evidence of the superiority of calcareous soils M. Leplay, in the pamphlet alluded to in our article on Beet-Root Distillation, gives the following table. “Beet-root of 2 lbs. weight, grown on calcareous soil, and submitted to chemical analysis, exhibited the greatest amount of saccharine matter, viz., 15 per cent.; and in estimating this richness, and taking it as a standard at 100, the beets yield the following proportionate numbers:

Type or Beet Root.	calcareous soils	clayey	flinty	mixed	
Roots of 2½ lbs., grown on	... 100	... 91	... 91	... 95	
	—	—	—	—	
	Roots of 4½ lbs., grown on	... 95	... 82	... 88	... 78
		—	—	—	—
Roots of 6¾ lbs., grown on		... 83	... 69	... 67	... 67
		—	—	—	—
	Roots of 9 lbs., grown on	... 82	... 61	... 64	... 66
		—	—	—	—
Roots of 11¼ lbs., grown on		... 76	... 52	... 60	—
		—	—	—	—

This table, it will be observed, opens up at once the question of “large and small roots—which are best?” one of the disputed points, as we have already noted, in connection with the crop, and in the discussion of which much information valuable to the agriculturist has been elicited.

The manufacturer desires small roots, as containing the largest per-centage, according to his opinion, of the saccharine matter—the farmer large ones, to give him the greatest possible average of weight off the land; and as containing, according to some, a larger per-centage of the azotic or nutritive matter necessary for feeding. On this point M. Hirsch says, “It occurs often that in appearance both interests are contradictory, as the opinion seems to prevail amongst the growers that the larger roots give a higher average per acre than smaller ones; and as it is an established fact that smaller roots give a higher per-centage of sugar. Now experience has shown that the beet-root which gives the highest per-centage of sugar, if properly grown, gives the highest average to the growers; and where different results are obtained, the cause surely cannot be attri-

buted to the beet itself or its size, but only to the mode of cultivation and the selection of the soil.”

M. Leplay says the following are his conclusions on this point, arrived at “after numberless chemical analyses, extending over a period of three years: The diminution of sugar in the beet is in proportion to its increase in weight. That this diminution is always more irregular and considerable in roots grown on clay, sandy, or mixed, than in calcareous soils. That the manures hitherto employed in the cultivation of this root do not appear to exercise any direct influence on its saccharine qualities, having to all appearance the effect of increasing its size and diminishing its saccharine properties. By regulating the distance between the roots you may at will regulate the amount of saccharine matter, and by decreasing the size you increase the rich quality of the beet. \* \* \* The problem of the maximum of sugar which can be produced per acre is resolved by a combination of circumstances acting *inversely*, viz., by applying the maximum quantity of manure and allowing the maximum of space between the roots, you obtain the least sugar.” Some three years ago a very elaborate series of experiments were made by Mr. Sullivan, of the Museum of Irish Industry, with a view to test the truth of the opinion very generally held on the continent, that “very large roots contained less sugar than those of a medium size.” The result of these experiments proved that the opinion was correct, for “out of 70 samples of roots, making altogether 430 different specimens, we have found,” says Mr. Sullivan, “only three exceptions to the rule that small roots are superior to large.” Mr. Sullivan operated upon saccharine roots of all kinds. Dr. Apjohn, chemist of the Royal Agricultural Improvement Society, in his experiments to ascertain the relative value of large and small roots, also came to the same conclusion—that the smaller roots contain the most sugar. But as to the amount or per-centage of sugar in the small roots, there is not the same agreement between these two eminent chemists; thus, out of 118 samples of beet, Mr. Sullivan found that “only 24 out of every 100 of them contained less than 8 per cent. of sugar;” and lays down as the result of his experiments that the saccharine matter constitutes with little variation almost 67 per cent. of the beet. Dr. Apjohn’s experiments, however, showed a mean result of 7.193 per cent. of sugar, and an average amount of crude saccharine matter of only 50.7 per cent.—a very marked difference. It is right to state, however, that the two chemists operated in a different manner upon the roots subjected to analysis. Mr. Sullivan operated upon the part of the root containing, according to the theory of M. Rehring, the largest amount of sugar, and which is thus described: “If we divide a beet-root into five parts by sections at right-angles to the longer axis, the 1st forming the crown, and terminating at the limit of the insertion of the leaf-stalks; 2nd, a segment immediately below the crown, varying from a half inch to one inch in thickness; 3rd, the body of the root; 4th, the point; and 5th, the bifurcation of the root, and the smaller roots, we shall find that the sugar, and consequently the solid matter, contained in each of those parts, varies very considerably.” The following results were obtained by M. Rehring, from an examination at successive periods of those different parts:

PER-CENTAGE OF SUGAR.

Date of Experiment.	Crown.	Segment of root below the crown.	Bottom of the root.	Point of the root.	Bifurcation and smaller roots.
28th October ..	2.01	8.74	12.07	10.47	5.41
15th November	2.00	8.94	12.31	10.69	7.34
20th December	1.23	8.61	12.08	10.64	7.20
12th February.	0.32	7.34	11.72	10.49	6.05
1st March ...	0.02	5.12	11.45	10.32	5.94

From these results—we may remark, in passing—Mr. Sullivan conceives that the plan very generally adopted in practice, of exposing a part of the bulb above the soil, is erroneous, inasmuch as the segment containing the least amount of sugar is allowed to expand. By covering up the plant the root is said to “finger.” Mr. Sullivan takes note of this objection, and says that it only proves “that the soil is not sufficiently broken up, and that if you surround a young bulb with a mass of mud clay it cannot expand equally, but will send out branches along the line of least resistance.” On this point M. Leplay also adds the weight of his testimony, for he states distinctly that “roots completely buried in the earth give 5 per cent. of their weight of saccharine matter more than those which grow above the ground.”

In preparing the roots for analysis, Dr. Apjohn separated the crown or upper part by a “transverse section, made sufficiently low to remove the entire of the portion, exhibiting at the points of attachment of the earlier leaves a ridged or imbricated appearance. The residue was then divided into four equal portions by a couple of sections at right-angles to each other, passing through the vertical axis of the root.” This plan was adopted with a view to obtain results fairly representing the constitution of the *entire* root, while Mr. Sullivan operated upon that part containing the maximum amount of saccharine matter. Assuming the correctness of M. Rehring’s opinion as to the distribution of the sugar in the root, as already pointed out, Dr. Apjohn remarks—and we think with fairness—that “it is obvious that experiments confined to the meridian transverse section cannot conduct to correct conclusions, in relation to the value of the entire beet as a source of sugar. So far from being correct, such conclusions must of necessity present an exaggerated view of the saccharine richness of the roots, and thus tend to raise hopes which must inevitably terminate in disappointment.” On this point of the per-centage of sugar contained in the beet, the opinion of M. Leplay, who has made the cultivation of the beet his special study, will be of some value. “The relative richness of the root in saccharine matter is by so much the more important, as the price paid for it becomes a considerable item in the question of profit in the manufacture of alcohol, and consequently the more sugar the beet-root contains the greater the yield of alcohol, and the less the expense incurred in its manufacture.

“It has been with me a subject of observation that the saccharine richness of beet-root of the same growth varies exceedingly, and that it is not an unusual circumstance to find roots which have been treated exactly alike, and grown in the same field, even exhibiting under chemical analysis a difference of from 5 or 6 to 15 per cent. in the amount of saccharine matter.

“The average yield of sugar in roots varying so widely in richness, is estimated in France at about 10 per cent. of their weight, and which ought, after being submitted to the most improved process of fermentation and distillation, to yield 19½ gallons per ton. This

average is, as I have before remarked, the result of a mixture of beet-root of various degrees of richness in saccharine matter; but there is no question but that if it were possible by an improved system of culture to raise roots of a great and equal richness, the alcoholic produce would be greatly augmented, and might be reasonably expected to give from 20 to 22 gallons per ton, and thus yield a much higher return.”

It will be observed that if the per-centage of saccharine matter in beetroots grown under the same circumstances varies as much in this country as it appears to do in France, the result obtained by Dr. Apjohn might have been considerably modified had his experiments extended over a larger number of roots, and might have approached that of Mr. Sullivan. We have before us the results of analyses instituted by celebrated continental chemists, all of which go to prove that the per-centage of sugar is, on the average, ten per cent.; and experience goes to prove that the composition of the beet is “pretty nearly the same all over the north of Europe,” Great Britain possessing the most favourable climate for its growth: after this, Belgium and the north of France.

Taking the experiments of Dr. Apjohn and Mr. Sullivan as the most elaborate which have yet been made—so far at least as we are acquainted with—into the composition of the beet, we find that however closely they agree as to the fact of large roots containing less sugar than small ones, they come to very different conclusions as to their feeding or nutritive value. Mr. Sullivan’s experiments, according to some, lead to the conclusion that small roots are as valuable to the feeder as containing more food, as they are valuable to the sugar manufacturer as containing more sugar than the large roots. “Our experiments,” he says, “as well as those of preceding chemists, have fully demonstrated that the solid matter of the beet scarcely varies in composition, or at least only varies within very narrow limits—that is the water alone, which increases and diminishes in relation to the other constituents; and that hence, if the per-centage of sugar be smaller in one root than another, the total amount of solid matter available for food or other purposes will also be smaller.”

We give here a table containing the result of experiments made by Mr. Sullivan, as to the amount of solid matter contained in large and small roots of the white Silesian beet. With reference to the fifth column, he says—“As at first sight the value of a small difference in the per-centage of solid matter may not strike persons unaccustomed to scientific calculations, we shall expose such differences in tons of raw roots. Thus if the average per-centage of solid matter in roots of a certain size was 13.461, and in small roots 15.156, the difference may be considered trifling; but when it is seen that 100 tons of such small roots would be equal to 117 tons of the larger, it will at once be perceived how important, in a practical point of view, such a difference becomes.”

Weight of large roots.		Weight of small roots.		Per-centage of solid matter in large roots.	Per-centage of solid matter in small roots.	Number of tons of large roots, equivalent in value to 100 tons of small.
lbs.	oz.	lbs.	oz.			
3	11½ to 4 2	1	3½ to 1 11½	10.403	17.427	167.43
3	2½ — 4 9	1	3½ — 1 7½	15.782	19.785	125.26
3	3½ — 7 10½	1	10½ — 2 12½	13.461	15.756	117.05
3	9½ — 4 3½	0	7½ — 1 4¾	12.942	15.321	118.36
2	9 — 2 15½	0	14½ — 0 14¾	14.671	17.152	116.91
4	13 — 5 14	0	3 — 1 4¼	14.863	15.892	106.92
5	13½ — 13 4	1	12¾ — 3 0	8.731	11.194	128.20
3	11½ — 3 15½	1	11 — 1 14	14.104	16.285	115.46

"From these results," says Mr. Sullivan, "we are justified in concluding that the larger the root the smaller will be the per-centage of solid matter it will contain. This rule is not only "true when grown in the same field, but also when the roots grown over a whole district of country are compared." The following shows the result of a large number of examinations of white Silesian beet: average of roots above 7lbs. gave a per-centage of 10.204; average of 5lbs., 11.653; of from 3 to 5lbs., 15.708; average of all roots, 14.532.

The results of Dr. Apjohn's experiments coincided with those of Mr. Sullivan, so far as the establishment of the fact was concerned that the smaller roots contained the largest per-centage of solid matter, and also a larger per-centage of sugar. But considering that sugar was not the only substance required for feeding purposes, that muscle and flesh had to be formed as well as fat, he carried out his experiments to a further issue, with a view to ascertain, "not only the *proportion* of sugar in the several roots, but (2) the aggregate amount of their azotized constituents; (3) the quantity of ash given by each, distinguishing the portions soluble and insoluble in water; and (4), the total amount of phosphoric acid in the ash of each root."

We regret that space does not permit us to give other than a brief analysis of a large number of experiments made to ascertain these points. These disclosed "several facts of scientific and practical interest." Thus, "in the case of the dried matter of the beet, the nitrogen—and the same is of course true of the corresponding albuminous compounds—is greater in quantity in the large than in the small specimens, or it follows a rule the inverse of that observed by the sugar."

Again (2), "the total ash of the larger is greater than that of the smaller roots. This is strikingly true of the beets." (3) In the beets "the soluble ash composed of the alkaline salts is much more abundant than the insoluble or earthy ash." (4) "The phosphoric acid appears to follow the law of the nitrogen, or to be more abundant in the larger than the smaller specimens." The bearing of these results upon the nutritive or feeding value of the roots will be apparent when we consider that while the non-azotized portions of food, consisting chiefly of sugar, gum, and starch, are useful in maintaining the temperature of the animal, and increasing its fat, there are other functions connected with nutrition, which require other substances in the food to enable them to be carried out. Thus, to repair the wear and tear of the muscular fibre and different tissues and to renew the blood, it is necessary that the "food should be at least partially azotized." Now, in sugar beet, as well as in mangel and the swedes, these two classes of alimentary principles are met with; and in them, to quote the words of Dr. Apjohn, "the amount of non-azotized alimentary matters is always relatively large, in fact more than sufficient for the performance of the duties we have ascribed to them, viz., of giving rise to oleaginous matter and maintaining the animal heat. If such be the case, it is obvious that, in estimating the

feeding properties of a root, the point to be principally attended to is the amount of azote which the root contains; and that with a view to estimate its value, the most useful experiment to make upon it must consist in burning it with soda lime. If the albuminous or proteinic constituents are found in the roots in sufficient quantity to restore to the blood its perpetual losses and build up the muscular and other tissues, the functions of assimilation generally will be carried on with a healthy vigour, and a degree of growth and healthy development of the whole body must ensue, which with a less animalized food would be impossible." Applying this criterion to the roots examined, Dr. Apjohn comes to the conclusion that for manufacturing sugar, and of course for distillation, large roots are inferior to the small; but that for the rearing and feeding of stock they are superior.

The points here opened up are of the utmost importance to agriculturists; and especially to those who purpose carrying out distillation processes. We incline, however, to the opinion expressed by Dr. Apjohn, that in relation to the sugar question (and of course to that of distillation) the whole matter is *not* decided by the fact of the small roots containing more sugar. "You are," he says, "to take into consideration the relative weight of the crop; and if the weight of the large crop be far greater than the small, the large crop may be better. You have only to get the per-centage, and multiply by the weight of the crop, and then you will have a product which will be an accurate measure of value; and if you institute that comparison between the large and small roots, it is my impression \* \* it may turn out that on the whole the large roots may be more productive for the production of sugar."

Seeing that one considerable point in favour of the establishment of beet-root distilleries on the plan of Leplay, already described, is the retention of the residues as a valuable food capable of being kept for a great length of time, it is of essential importance that a root should be obtained which is not only valuable for its amount of saccharine, but for its nutritive qualities; and as regards the latter, the weight of practical opinion in this country is apparently in favour of large roots. From any point of view the subject is of the highest importance, and all its details deserve the most earnest consideration. The question involves many points of importance with reference to the mechanism and practice of culture; for the advocates of the continental system, or "small roots," recommend narrow intervals between the roots, the adoption of which, in the opinion of many farmers, would throw difficulties in the way of cleaning and cultivating the crop.

But on this, and other points connected with the preparation of the land, the choice of seed, the hoeing and cleaning of the crop during growth, and the harvesting and the storing of the roots, we hope to dwell in a future article. This opportunity may shortly be afforded us in noticing a work which we are anxiously looking for, on the "Cultivation of the Beet," by M. Leplay, and which has been presented by him to La Société d'Encouragement de Paris. R. S. B.

## THE RESTRICTIVE COVENANTS IN LEASES.

A celebrated writer, treating upon experience, observes, that a man may read a thousand volumes in a hundred tongues, and enshrine the lessons of experience in his mind, and then go forth none the wiser. His self-love will lend him a glass that will colour all he has coned. And thus it is even in the

most ordinary affairs of life. Every one apprehends a question as it suits his interest, or meets his approval; and thence the ever-conflicting opinions that arise upon subjects, plain and palpable to common sense, but too often received with a spirit of prejudice or interested opposition. Thus, in that long-mooted, but still un-



settled question of the restrictive covenants in leases, we are still as much at issue as ever; nor is it probable that it will become arranged, so long as landlords remain in the position to dictate terms to their tenants, or of land-agents who, in the exercise of assumed powers, will close their ears to all observations from the weaker quarter.

It is not long since that we had occasion to comment upon the leases of the Duke of Northumberland, and we have now another instance of what may be expected from other land-agents, in what has fallen from Mr. Grey, of Dilston, at a recent meeting of the Hexham Club. At a period when farming has assumed a new phase, and is becoming day by day dependent for its success upon the amount of capital and skill brought into operation, it becomes more and more apparent that greater liberty of action, as well as increased security of capital, should be conceded to the tenant. With this view, the members of the Hexham Farmers' Club propounded a lease that it was considered would embrace these objects; but although this lease proposes to have emanated from tenants, a cursory glance at the covenants and clauses introduced into it must convince every one that, if they really did come from such persons, they were only instruments in the hands of others who had sufficient power or influence to impose them. For, of the two, the lease propounded by the Hexham Club is in many parts more restrictive than that of the Duke of Northumberland.

The productions of a farm, whether of grain or root crops, ought to be equally available by the farmer for conversion into manure; and in case his farm should be situated near a town, where straw and roots can be sold at a greater price than could be obtained by feeding them out upon the farm, the tenant, under certain conditions, ought not to be prevented from disposing of them to the best advantage.

This must have been one of the objects sought by the members of the Hexham Club. But, what are the conditions that it imposes? Why, that every tenant, upon disposing of a ton of mangel wurzel or turnips, shall incur a penalty of *five pounds* for every ton of turnips, or other roots, or straw, that he may sell, unless purchased manure to the value of *one pound* for every ton of roots, and two pounds for every ton of straw or hay be brought back to the farm. Moreover, in addition, he is bound to give *due notice* previously, to the landlord or his agent, of his intention so to dispose of any turnips, roots, hay, or straw, and afterwards to produce vouchers of the purchase and of his bringing back the manures as stipulated.

Assuming the calculation to be correct that a ton of turnips is equivalent in production to a stone of 8lbs. of mutton or beef, the value of such turnips would be defined by the market price of meat for the time being, and which may, for the sake of argument, be put at 6d. per lb., or 4s. per stone. This sum, therefore, would represent the value of a ton of turnips consumed upon the farm; but the marketable value thereof might be, and would in most cases be, from 15s. to 20s. per ton. This, however, relates only to the tenants' interest. The landlord interposes and claims the right of having those turnips or roots consumed upon the farm, so that a proper quantity of manure may be made and returned to it. Such a loss, therefore, as he may consider the farm would sustain by having the turnips removed, is the only question at issue, or now to be considered.

The usual estimate in reference to this question is,

that an acre of turnips will return, in manure, twice the quantity it has required to produce them; not estimated exactly in manure made by the cattle or sheep feeding upon them, but that the manure left unconsumed after the turnips are removed, in addition to the manure produced by feeding them, would be equivalent to double the quantity carried on for their production. Assuming, therefore, the growth of the turnips to be equivalent, in tons, to the tons of manure carted on, a moiety of the manure would be only chargeable to that crop; as every ton fed out in conjunction with the straw used would produce a ton more, the loss to the farmer by the removal of a ton of turnips would, with the straw, be equivalent to the abstraction of a ton and a-half of farm-yard manure—equal to 4s. 6d. in money value. Again, without estimating the value of the straw consumed, the utmost value removed by a ton of turnips would be 4s. 6d., and for the removal of which the Hexham lease provides that manure of the value of 20s. be returned to the farm, involving a loss to the tenant of not less than 15s. for each ton sold—less the value to be derived by him afterwards from the manure brought on.

We have rather elaborately entered into this calculation, to show the absurdity of such restrictions, believing as we do that land-agents err in such matters rather from ignorance than any other cause. We trust, therefore, that if we can point out a remedy, there may be some persons still who may be disposed to adopt it. Suppose, then, for instance, that a tenant might find it to be beneficial to himself to sell roots or straw from his farm, what quantity of manure, by way of equivalent, ought he to return to the land? We have before premised that a ton of manure would produce a ton of turnips, and, consequently, that the benefit derived by feeding them would be equal to the value of a stone of meat at 4s.; that 2s. of this load of manure has been unexhausted by the turnips, and the value of another load that might be produced by them would be 4s. more, giving the sum of 6s. as the amount of injury sustained by the farmer by the removal of each and every ton of turnips. But then it must be recollected that the tenant has a right to the use of this manure, except in the last year of his term; and, therefore, by returning 6s. in value of any description of manure he would be giving a full equivalent for the roots removed.

We should suggest that the question of removal of turnips would be better adjusted by the tenant bringing the manure upon the farm for their production previous to taking them off; and if produced by guano, or any of those artificial manures that the turnip crop would exhaust, that half the quantity of a like description of manure should be applied to the land after their removal. To reduce this to figures, say 3 cwt. of guano, 45s., for the turnip crop, and 1½ cwt. after its removal, 22s. 6d.—total, 67s. 6d. per acre; and the quantity of turnips produced 15 tons, equivalent to 4s. 6d. per ton, as stated in the previous calculation.

A new process in course of being established in this country, for distilling spirits from beet, and feeding the residue with cattle—the latter is stated to be of equal value to the roots. Whether this be so or not, if the process can be established it would become necessary that tenants should be allowed to dispose of their roots, or the carrying out of the process would not be likely to succeed. Under the competition that the British grower of wheat will have to meet, every facility ought to be allowed, not only by the Government, but by landlords themselves, to enable him to realize from his farm; while amongst the first of these facilities must come liberty of action and liberal treatment.

## THE CLAIMS OF THE LABOURER.

Can that improved state of agriculture which has been the growth of the past century, and that enlargement of farms which has produced and accompanied it, and which is the inevitable tendency of the present age—can they be reconciled with the welfare of the agricultural labourer? Must we, on the other hand, accept it as a sad and mortifying truth, that while our cattle have grown sleeker under better food and better habitations, and while our garners are groaning under the increased produce which it is the boast of capital, skill, and science to have produced, “man has been the only growth that has dwindled here”? It is not in his physical strength, nor his powers of endurance, nor his indomitable courage, that the degeneracy manifests itself. To these abundant testimony is borne by those great public works which have been raised during the period by the strength of his arm, as well as by the battle-fields of Waterloo and the Alma—of Inkerman and Balaclava. Is not the degeneracy complained of rather to be sought in the flight of those domestic virtues which were once thought to have their peculiar home in the cottage of the peasant? Is not this degeneracy traceable to the altered relations between employer and employed? Is there no means of restoring the ancient or introducing even a better state of things? Cannot the labourer in husbandry be made to participate in those advantages which the application of all our modern improvements have bestowed on the farmer and the landowner? We believe that he can; and that with judicious arrangements on the part of the owners and occupiers of the soil, the rural labourer may share the benefits of the large-farm system. The necessity for a comfortable dwelling in close contiguity to, or, better still, on the farm where he labours, cannot be too often insisted on for its economic as well as its moral advantages. Its economic advantages, under the present system of farming, which bestows so much more labour on the land than the system which it has superseded, must be obvious. Labour expended in walking to and from work is labour wasted; and whatever wastes labour for the farmer wastes rent for the landlord. Under the open-field husbandry which prevailed about a century back in many parts of the island, there would not have been such a glaring incongruity in the home of the labourer being remote from his work. The farmers and their labourers all congregated then in villages at a distance from the lands they cultivated. To those villages all the produce was dragged; and as the manure would necessarily have been obliged to be dragged back again, it was not surprising that it should have been deemed necessary to take back as little as possible, and that the art of farming in those days consisted in extracting as much from the land, and returning as little to it, as possible. The art of farming under the modern system appears to be considered by some to consist in obtaining as much from the labourer in husbandry as we can, with as little return as possible. The system which failed with the land has failed with him. Now, however, we understand these things better as regards the land, and it is considered desirable, when the farm is of moderate size, that the buildings should be as centrally situated as possible; and that when it is of the enormous magnitude of some of those of Lincolnshire, cartage should be economised by means of detached barns and cattle-sheds. When shall we learn to apply these principles to our labourers as well as to our cattle?

When shall we learn that the man who has to perform half a day's labour in walking to and from his work, cannot do as much for his employer as he who resides upon the spot?

The moral advantages resulting from the labourer residing on the farm he cultivates are quite as great, and of much more importance, than the economical advantages. The failing of the English social system is the repulsive element which prevails between the different grades of which it is composed. How many little good offices would such contiguity give birth to! How much would it tend to remove that mutual want of confidence which too generally prevails between the farmers and the labourers!

The next improvement required is, the restoration to the labourer of a small portion of land to be cultivated for his own benefit. We care not whether it be an eighth of an acre or a fourth, provided it be attached to his dwelling. If that dwelling be on the farm, there will be little difficulty in providing it with land; and the allotment system may be left for the population of the towns: to them it is a great boon, but the farm-labourer should not require it.

Next to the want of decent homes for labourers with families, is that of lodgings for the unmarried labourers in those districts where it does not accord with the present habits of the farmers to lodge them in the farm-house, as was the common practice a century ago, and is still continued in some districts. Perhaps this want cannot be better provided than by means of lodging-houses, on the plan of that described by Sir Arthur Elton, and put under the care of a respectable couple. One of the objects to be aimed at in the establishment should be to keep the young men from the beer-shop, by providing them with recreation for their leisure hours. There should be a space attached to it, or near to it, for cricket and other athletic exercises for the summer, and a reading-room for the winter evenings. Here, on stated days in the week, an evening school should be held for those who wish to improve themselves under voluntary tuition. It is idle to say the school would not be attended. Wherever such schools have been established, there has been no lack of eager and attentive scholars. Lectures on a variety of instructive and amusing subjects should be given them, on stated evenings. But who are to be the lecturers, and what the subjects? For the subjects, outlines of history—geography and accounts of foreign countries, their animal and vegetable products, their inhabitants and their manners—together with descriptions of our colonies, will always be found attractive: we speak from experience. So will lectures on chemistry, which in all assemblies are sure to be popular if accompanied with a few experiments, which may be easily exhibited, and by means of very cheap apparatus. Explanations of the steam-engine, too, would be not only entertaining but highly useful, now that steam is being so largely applied to agricultural operations. In these days of agricultural chemistry and of chemical manures, chemical lectures will be useful as well as amusing. The louder the explosions and the greater the stench at a chemical lecture, the greater always is the applause. The diffusion of such knowledge among farm-labourers will lead, moreover, to advances in chemistry applied to agriculture. Once set the labourers thinking, and they will soon learn the import of facts which are daily passing under their eyes more than under those of the

farmers, and still more than under those of savans. But who are to be the lecturers? The clergymen, the gentlemen, and the young farmers of the neighbourhood. With some of the subjects every man who professes to have received any education ought to have some acquaintance, and those who possess it not will find that there is no better way of learning anything than by undertaking to teach it.

One great object in providing rational and intellectual amusement of this kind, is to keep our labouring classes away from the beer shop. The tendency of our legislation, however, is to tempt and to drive them to it. Our malt tax and our beer tax—though the latter is repealed, the public-house system which it engendered remains—these have driven our labourers to the public-house in quest of that beverage which the English labourer must and will have, and which a century ago he could have at home, and share with his family. Brewing was then quite as much a part of the rural housewife's

duty as cooking and baking. Home-baked bread and home-brewed beer have vanished from our cottages; and the labourer, if he drinks beer at all, must drink it in the ale-house. We complain of his drunkenness, and at the same time congratulate ourselves on the increase of the revenue which those habits produce. Cowper complained of the Act-of-Parliament drunkenness even in his day, and it has greatly increased since he wrote:—

“ Drink and be mad, then; 'tis your country calls;  
Gloriously drunk obey the important call:  
Your country needs the assistance of your throats:  
You all can swallow, and that's all she asks.”

Few things would tend so much to improve the comforts and morals of the rural labourer as the repeal of the malt tax; but what would vested interests in drunkenness say to that? They are numerous and powerful.

## TRANSFER OF LANDED PROPERTY.

The ownership of the soil has undergone a revolution during the last hundred years of agricultural progress, quite as great as that which has affected the relations between the farmer and the labourer.

When Marshall wrote his “ Agriculture of Norfolk,” in 1788, he described the cultivation of West Norfolk, to which his observations were chiefly confined, as still largely conducted by yeomen farmers, though their numbers were diminishing. As prices advanced, they sold their paternal acres to become large renting farmers. The change has since gone on increasing, till, if we may believe a foreign writer who has recently visited this country, the soil of England, which in 1786 was shared by 250,000 proprietors sole and corporate, had become absorbed in 1822 into the hands of 30,000. If we carry back our inquiries to a remoter period, we are told by the statistical writers of the time that the number of those who farmed their own land exceeded the number of those who farmed the land of others. On what data these statements are founded, in the absence of that statistical information which, in this country, pervades everything agricultural, we will not pretend to inquire; but without placing implicit reliance on them, it cannot be denied that the number of those who own the soil of England has greatly diminished, and that its cultivation is chiefly in the hands of tenants-at-will, or, at best, of those who have a mere chattel interest in it as leasehold tenants.

Among the causes assigned as having produced this change, the intricacies of the laws affecting the transfer of landed property are insisted on, in some quarters; and it cannot be denied that it would be a great advantage to the community if the transfer of landed property could be simplified. We cannot admit this, however, to be the sole or the chief cause of the consolidation of estates. The intricacies of conveyancing were quite as great as they are now, at the time when yeomen cultivators were more numerous. Those intricacies arise out of the desire inherent in human nature to provide for the disposal of property among future generations. To leave their substance to their babes, and call the lands after their own names, has been the practice of the wealthy, since the time of the Psalmist. In this way land has continually been aggregating for a time into masses, and when the aggregation had reached its height, a re-distribution of property has taken place, either by some violent convulsion, or

by those silent social revolutions which the increase of commercial wealth produces. After the Norman Conqueror had parcelled out the fair fields of the Anglo-Saxon proprietors among his followers, the first great monopoliser of it was the church; and many of the intricacies of our forms of conveyancing arose out of a struggle between the legislature to prevent the accumulation of land in mortmain, and the contrivances of the monks to evade them. The church, however, prevailed; and at the time of the Reformation had absorbed the greater portion of the soil. The dissolution of the monasteries at the Reformation, and the subsequent troubles of the civil wars, had produced that redistribution of landed property which, in the seventeenth and eighteenth centuries, placed a large portion of it in the hands of cultivating proprietors. An imperceptible change has produced that re-consolidation of landed property which we witness at present. The yeomen farmers at the close of the last century sold their lands for various reasons; not because of the intricacies of conveyancing, but for various other pecuniary reasons. Some sold their lands because they were too much burthened with mortgages, arising from the borrowings of several generations, to leave them anything to live upon under the advancing prices, and with their land let on leases of such length as to prevent them from deriving benefit from the increased value of the produce. Others, who were not so enumbered, sold their lands because money invested in the cultivation of the soil yielded better interest than money invested in its ownership. If that was the case at a time when farming consisted chiefly in collecting the natural produce of the soil, that disproportion has been by no means diminished when a more energetic cultivation obtains larger returns at a comparatively diminished expense, but demands on the part of the cultivator the command of a larger capital. Let us suppose the rent of land to be 30s. an acre, and the farmer's capital required for the purposes of cultivation to be £10 the acre. He can cultivate a farm of 300 acres with £3,000, on which he should make at least ten per cent. If he is to become the owner of this farm at the rate of thirty years' purchase, he will require an additional sum of £13,500; that is to say, he would require as much capital as would cultivate a farm of more than three times that size, or enable him to establish three sons in three farms of the same size

as his own. To this cause, rather than to the legal expenses of the transfer of land, it is most rational to attribute the diminished number of farmers cultivating their own land. We will suppose a farmer possessed of the above capital, and blessed with three sons and two daughters: how is he to provide for them all, if so large a portion of his capital is sunk in the purchase of the land?

We do not deny that diminution in the expense of transferring land would be a national advantage. One thing which would greatly facilitate it would be, as we have pointed out before, the establishment of a cadastral survey, so that every title-deed might have an authentic map of public record attached to it, showing the boundaries of the land conveyed. A large portion of the expense of a conveyance arises from the necessity of describing in words the boundaries of the property. A registration of deeds, moreover, might perhaps tend to the same end; but as long as men are suffered to entail estates, short and simple title-deeds are out of the question. The titles of the Irish Encumbered Estates' Court are short and simple enough—none could desire shorter. But how long will they continue so? In another century or two they will become as intricate as ever, when those who have recently purchased shall have loaded them with encumbrances

similar to those which caused them to pass into their hands from those of the former owners.

Destroy the power of entailing estates, and you may have as simple and as cheap conveyancing as you please. But are entails ever likely to be abolished in England? Is it desirable that they should be abolished? Is not the peerage as essential a part of the British Constitution as the other two estates? Have not recent discussions, on many important questions, shown that they meet with a more statesman-like consideration in a house of hereditary legislators, with all the anomalies and absurdities which appear to centre round the idea of an hereditary statesman, than are to be found among the conflicting influences of a popular assembly? And how long would the peerage last—how long would it maintain its independence—if the power of entailing estates were abolished? How many, again, of the owners of these large estates are more than the nominal, or collectors of rents to be paid over to mortgagees? We could point to several districts where an Encumbered Estates Court is as much wanted in England as ever it was in Ireland. It is, however, very doubtful whether an English Encumbered Estates Act would do more than to transfer the land into the hands of the millionaires of commerce, rather than into those of cultivating proprietors.

## THE SUPPLY OF GUANO.

There is a growing deficiency of supply in two very important articles of import and consumption—Cotton and Guano. Notwithstanding a cotton crop last year of 3,500,000 bales in the United States, owing to the increased demands of other countries, and the greater quantity of the raw material worked up here and in America, we are left with a supply barely sufficient for seven or eight weeks' consumption. Supplies from other quarters come in but slowly; and in the meantime the Chairman of the Manchester Commercial Association states, that for want of cotton they are starving; and that one of two things must happen shortly: a number of spinners and manufacturers, and those the weakest, will be compelled to stop their works, and their workpeople will be thrown out of employment; or, we shall have completely used up our stock of cotton.

The second deficiency is that in which our readers are more especially interested. The supply of Guano received is inadequate to the growing demands of the British farmer, notwithstanding the beds available are still ample, and the price too has recently been enhanced £2 per ton by the Agents of the Peruvian Government.

We subjoin a return of the yearly imports of guano since the first introduction of that manure, some sixteen years ago, from which it will be seen that the receipts are very disproportionate to the increasing wants of agriculture. We have imported in that period something over two million tons; but on the average of the last four years the annual imports have not exceeded 215,000 tons.

Other countries are pressing forward for supplies of Peruvian guano, to which quality we are now exclusively restricted. The continent takes some 40,000 or 50,000 tons, the United States import 70,000 to 80,000 tons (the port of Baltimore alone taking half that quantity); the sugar and coffee growing colonies are also liberal customers; and therefore, while the aggregate annual exports from the Chinchas are larger, we

do not receive as much now as we did ten or eleven years ago.

Attempts have been made from time to time to do away with the present Government monopoly, which places the purchaser, both as to price and quality, entirely at the mercy of a trade which is alike unsatisfactory to the merchant, the agriculturist, and the shipowner.

If the trade were thrown open the consumption would be increased, without any probable reduction of price, or loss to the Peruvian Government. We believe the contract of the Messrs. Gibbs expires this year, unless it has been renewed.

In addition to stocks being unusually low in the United Kingdom, the ships expected to arrive within the season are under those of former years. In the month of November (the latest advices we have), only 14 British vessels, with about 9,000 tons, had loaded at the Chinchas, and this is not all available for home-consumption. The Scotch farmers have found great benefits from the use of guano; but instead of having, as usual, an available stock of 3,000 to 3,500 tons in the Clyde, there is only 1,000 tons ready to be doled out to the agriculturists.

A year or two ago we called attention in our columns to the impending scarcity of this fertilizer, and stated "that in times when the necessities of millions of human beings are demanding more food—when prices are so high as to stimulate the farmers to grow as much grain as possible, and so make hay while the sun shines—they are told they cannot have the quantity for either love or money." The observations made then are even more pertinent now, and we could beneficially use half as much more guano annually as is now supplied out to us under present rates.

In all parts of the kingdom the subject is occupying prominent attention amongst farmers. At the last meeting of the Highland and Agricultural Society of Scotland, Dr. Anderson, Mr. Hall Maxwell, the Duke of Buccleugh, and other speakers, alluded to the failing supply, and to the necessity of looking out for substi-

tutes. At Truro Mr. Nesbit was catechized by the farmers on the possibility of artificial fish-manures becoming available; and in other quarters sewage-manure is being again looked after.

In 1852 an official report was published by the Peruvian government, which stated that an examination, made by a French engineer employed, gave the quantity of guano on the Chincha Islands at about 16,500,000 tons. Taking the present gross shipments from thence at about 400,000 tons per annum, with the probable increased demand, this supply will be exhausted before the end of the present century. As the Peruvian government nets somewhere about £4 per ton for this guano, these deposits bring in a revenue of more than a million and a-half per annum; a sum exceeding the revenue of Hanover, Denmark, Sweden and Norway, and many other of the European states. The national debt of Peru, which is about £9,250,000, might be paid off from the proceeds of guano sales in six years.

There can be no doubt that, with the progress chemical science has already made in various departments, the question of a beneficial substitute for guano as a

fertilizer is capable of solution; and we are disposed to believe that the refuse of the fisheries, properly prepared, may yet come in largely to the aid of the farmers. To discover new supplies of guano, or efficient substitutes in the form of manuring substances in small bulk, it has been well observed, are worthy objects of mercantile and scientific enterprise, more especially in view of the rich reward which would repay success by the extensive sale of an efficient fertilizer at home and abroad.

#### IMPORTS OF GUANO SINCE THE FIRST INTRODUCTION.

Years.	Tons.	Years.	Tons.
1841 ..	2,881	1849 ..	83,438
1842 ..	20,398	1850 ..	116,925
1843 ..	30,002	1851 ..	243,014
1844 ..	104,251	1852 ..	129,889
1845 ..	283,300	1853 ..	123,166
1846 ..	89,203	1854 ..	235,111
1847 ..	82,392	1855 ..	305,061
1848 ..	71,414	1856 ..	200,000

Total.....2,120,445.

### WHAT SHOULD BE A BUSHEL OF WHEAT?

A meeting of agriculturists took place in the Town-hall, Ross, Herefordshire, on Thursday, Jan. 29, to consider the above question. It had been convened by an advertisement from the Mayor, A. Maclaverty, Esq., who took the chair on the occasion, and there was a large attendance of those interested in the question.

The CHAIRMAN said he had convened the meeting in accordance with a requisition signed by about forty influential agriculturists, setting forth that 60lbs. was much nearer the average weight of a bushel of wheat than 62lbs., and asking him to call a meeting at which the matter might be debated upon. As he was personally unacquainted with the merits of the case, he must leave it to other gentlemen to bring their views forward; but, whether it was decided for 60lbs. or 62lbs.—whether for facility of calculation or the extra two pounds—he trusted the result of their proceedings would tend to procure uniformity of weight all over the kingdom; for that, as he understood, was the great *desideratum* with the public (Hear, hear). Prices would soon right themselves; but to obtain uniformity of weight seemed to require a little gentle pressure of public opinion. It had been arranged that Captain Power should move the first resolution, but, in that gentleman's unavoidable absence, he called upon

Mr. W. WYLIE, who regretted that they had not the benefit of Captain Power's presence on this occasion. Of course, they had a great deal more wheat to send out than to bring in; but he could not understand what was meant by a bushel of wheat, unless it was a bushel of 8 gallons. They might put it at 60lbs. or at 62lbs.; but to sell 62lbs. for a bushel when a bushel did not weigh 62lbs. was a mistake. The resolution he had to propose was this: "That the opinion of this meeting is that 62lbs. is 2lbs. more than the average bushel, imperial weight, in this district, and they therefore think it expedient that the weight per bushel sold in this market should not exceed 60lbs." He would not detain them any longer, as it was market day, and they had business to do; and he therefore begged to propose the resolution he had just read.

Mr. H. CHELLINGWORTH seconded the resolution, and said he had spoken to our worthy members of parliament on this subject, at a public meeting, and Mr. Blakemore said he thought a uniform standard would be of great advantage if carried out. He also promised, that if the government did not undertake it, he would bring it forward himself. He trusted Mr. Blakemore would do so next session, and this was the more likely because that gentleman was now an extensive farmer on his own account, and must therefore know the advantage which would result from the proposed alteration. At present there was a great variation in the weight of a bushel of

wheat in different parts of the kingdom, so that no one could judge of the price from the figures given in the newspapers, not knowing how much was meant by the quoted bushel. He thought it the duty of their representatives to watch over their interests in this matter; and he would not promise to vote for any of them if they did not support such a measure. They were honest, good men, but must be called upon to do their duty. There was another subject, not immediately connected with the object for which this meeting was called, but to which he would take this opportunity of adverting: the propriety and necessity of having some suitable place in which to hold their market (Applause). It was of no use their growing corn, if they were to take cold and bring on premature deaths when they came to sell it. At present they had no comfort or accommodation; but here, for instance, was a room, large and comfortable enough, and in every way suitable for the purpose, which he thought could be had; he felt sure that Captain Power, as lord of the manor, would allow the use of the town-hall for such a purpose, under regulations, which might easily be agreed on (Hear, hear).

Mr. POWELL, of Old Forge, said he thought Mr. Wylie was going to move a very different resolution. He advocated a uniform weight, adding that it did not matter to the buyer, who would regulate his calculations according to the weight which he purchased; but if they pretended to sell a bushel, they *must* sell a bushel, and all that meeting could say, nor all the resolutions they could pass, would not controvert that. If they would make this a pitch market—as he wished they would—every man could tell what he was buying; but every buyer would regulate the price he would give according to the weight of the bushel he was going to buy, and so it would not matter how they fixed it. He could not understand what this meeting was for.

Mr. CHELLINGWORTH: The rent-charge is governed by the weight of the bushel of wheat.

Mr. POWELL: I would as soon buy 60lbs. as 70lbs. to the bushel; but if you sell a bushel, it should be by measure.

Mr. REYNOLDS, of Stafford Mills, Stroudwater, said neither of the gentlemen who had spoken had shown the least necessity for the change they advocated in this particular market. He would not go against what Mr. Chellingworth had so ably put before the meeting about the necessity of appealing to Parliament for an uniform standard; but the change now proposed would only have the effect of engendering differences between dealers and sellers, when nobody could plead that they had lost by the custom they had established. What between railway accommodation, the quantity grown in the locality, and the good understanding between buyers and sellers, they had

one of the best little grain markets in this part of England; one which is attended well and supplied well, and where wheat is readily taken up; neither had he heard of anybody running away very much in their debt (Hear, hear, and laughter). He also hoped and expected that Mr. Wylie would have proposed a different kind of resolution, for he thought his inclination was more in favour of postponing the question, and abiding any decision made in Parliament, than of passing a resolution which would bring farmers and dealers into a collision which everybody would regret. It generally takes two persons to make a bargain, but in this case it required three—the farmer, the dealer, and the merchant. The farmer should recollect that he is no longer the sole supplier of the market, and that probably for the future he would be less so than now. They were surrounded by markets where 62lbs. was the weight of a bushel; his engagements were all fixed upon the basis of that weight; and, whatever they may decide, the cost of railway carriage, sack-hire, boating, and every other incidental, would be reckoned upon that scale. He would make no secret of it, but tell them plainly, that it took six bushels of wheat to make a sack of flour, and it could not be done under; if they altered their weight to 60lbs., it would make £100 a-year difference to him, in his establishment. Had all the farmers in the room lost such a sum by selling 62lbs. to the bushel? There was not a draper or other shopkeeper in the place who did not know the comparative value of his goods, and it would be a libel upon the farmers to say that they did not: well then, if they could arrive at that, why not sell 62lbs. to the bushel where it was an accommodation to the buyers, and no loss to themselves? The buyers here were the sellers elsewhere, and they were expected to accommodate their customers. They must be ruled by surrounding markets and competing dealers, and so long as 62lbs. was the weight at Hereford, Wolverhampton, Durham, Birmingham, Worcester, Tewkesbury, and other places, why should not they do the same? The dealers came to Ross and bought all their surplus wheat, and it would be to them as bad as a break of gauge in a railway if the weight was to be altered at one place. They had better pause, and consider that the more inducements were offered, the more dealers would attend their market, and the greater would be the competition; and, therefore, what would benefit buyers was equally in their own favour. They had better wait and see what Parliament and their County Members would do in the matter: the dealers did not care how it was arranged, when it became the subject of an Act of Parliament, because railway companies, carriers, and everybody else would then regulate their charges accordingly to the Act. To speak the truth of his mind: he could not expect all the country to be dictated to by Ross; it really reminded him of the “three tailors of Tooley-street,” who called themselves “We, the people of England!” But they must not think that all England met in the Ross market, and didn't fill it (laughter). On behalf of the dealers, he would ask, and insist, that their interests should be considered, for they were not to be ignored and made subservient in the matter. He was open to take the wheat by measure—any measure they chose; let them pitch their sacks. But they could not make the sacks alike, and therefore they sold by weight for their own accommodation. But they should put a boot on each leg, and not have it all their own way: the dealers had given up their measure; let the farmers give them their own weight. The dealers would not ask for any weight if they would pitch their sacks; but if they would sell by weight, let it be that weight which prevailed around them, which would be an accommodation to the dealer, and no loss to the farmer. If they could show him that they lost anything by selling 62lbs., he would meet them at any other weight they pleased; but the dealers had to make out their returns to the Government Inspector for so many bushels of 62lbs. each, but there was standard weight.

Mr. CHELLINGWORTH: We know that 480lbs. is the weight of a quarter of corn.

Mr. REYNOLDS: Do you know that as a fact? I have written to the Comptroller of Corn Returns, and according to his answer each man makes up as he pleases, and there is no definite standard. Mr. Wylie comes from a country whose inhabitants are remarkable for being sagacious and enterprising, and good farmers; but what will he say when I tell him the Comptroller writes to say that in ragged, shoelless, stockingless Ireland, they sometimes get 65lbs. to the bushel? Mr. Reynolds then read a letter signed “H. T. Jadis, Comptroller of Corn Returns,” in which the writer stated his inability to

furnish a standard weight for grain, and mentioned the fact narrated with respect to Ireland. He then continued: They had five exceptional years; there was war for a year or two, and wheat obtained a very high price: the farmer pushed the growth of grain, and met with a ready sale; wheat had been sown eleven months in the year instead of two; the grain never matured, and a great quantity of it would not go into a mill. But this would not last, and they must return into the old course again; indeed, he had lately found fault with some of those great big sprawling wheats, which change their names about once in a twelvemonth, because they cannot keep a character for any time. But the question simply came to this: the farmers lost nothing by selling 62lbs., while the dealers gained by it; and they were not going to surrender it in Ross-market. If Parliament made 60lbs. a law, they would cheerfully abide by it; but it would be very ill-advised and impolitic for them to make any such regulation. He had formed many pleasing friendships amongst them, and had transacted business with most respectable men; and it would be with great pain that he ceased to do business with them, as he should if they destroyed the harmony of the market by making such a rule as the one proposed. At Gloucester, Mr. Curtis Hayward, after presiding over a meeting at which it was resolved to adopt 60lbs. as the weight of a bushel, had gone back to 62lbs.; and so it would be here. In conclusion, he begged to propose the following amendment: “First: That experience proves that the sale of corn by weight is more satisfactory than by measure, as it prevents disputes arising between buyer and seller in consequence of the irregularity of weight which, under the present mode of threshing and winnowing, is inseparable from selling by measure. Second: That this meeting is of opinion that one uniform standard weight for each kind of grain, fixed so as in an average of years fairly to represent the imperial bushel of the grain for which it is intended, would be a great advantage and convenience to farmers and dealers, and would render much more simple and accurate both the reports of the corn markets and the return of the corn sold in them.”

Mr. DUCKHAM, of Baysham, seconded the amendment, and said a crop did not altogether depend upon what had been urged by Mr. Reynolds. Sometimes they had blighted crops, and sprouted corn, which, although it would fill a measure, would not weigh so well as good kind grain. He noticed the difference of quotations of prices, which was sometimes as much as 3s. 6d. per bushel; and he thought prices could be much more equalized by weight than by measure. He advocated uniformity in weight as the great want; for, if they took up a newspaper, they found the prices to differ because the weights differed. It was 70lbs. at Liverpool, 72lbs. at Shrewsbury, 80lbs. at Monmouth and Abergavenny, 62lbs. at Hereford and 60lbs. somewhere else; while in London, and some other great markets, they bought by measure and not by weight. The want of uniformity in this particular was a national disadvantage to both consumer and grower. There was another thing they should embody if they petitioned Parliament—there was an improvement necessary in making out the corn averages. He complained that at Hereford perhaps only one grain was mentioned; and other kinds, the price of which ruled their tithes payments, were removed to distant places, such as Birmingham, Shrewsbury, Cardiff, or Swansea, and the price was published with the addition of the cost of transit; so that they had to pay their tithes upon the increased value of the corn. The producer, and not the seller or the buyer, was the only man who could justly be called upon to make those returns; and he knew there were thousands of bushels of grain grown in this district which did not go into the returns. Hereford was the only place in the county entitled to make a return, and all they produced and sold went as nothing, while they had, in consequence, to pay their tithes upon most imperfect and fallacious data (Hear, hear).

Mr. REYNOLDS again repeated that 62lbs. was a fair weight, and said a “petty market” like Ross should be ruled by those surrounding it.

Mr. WYLIE hoped it was not imputed that, because theirs was a “petty market, they were “petty” people who came there. A subject must be brought forward by some one; and he had only undertaken to propose the resolution because they need not sell 62lbs. when 60lbs. was over the general average (cries of “No, no,” and disapprobation).

Mr. REYNOLDS disclaimed all intention of reflecting upon any parties, or of giving offence to any. He did not know whether Mr. Wylie was trying to carry out the Gloucester

principle, nor did he care; all he wanted was the imperial measure.

The CHAIRMAN then took a show of hands; first for the amendment, and then for the original motion.

The amendment was declared to be carried.

Mr. T. S. BRADSTOCK, of Cobrey Park, wished to put the matter right. Mr. Reynolds had said it did not matter to the farmer what weight was given to a bushel.

Mr. REYNOLDS: Not as farmers.

Mr. BRADSTOCK said all farm payments were regulated by that—the commutations, and other matters. He then proposed a vote of thanks to the Mayor for his efficient and impartial conduct in the chair.

Mr. CHELLINGWORTH seconded the proposition, which was carried by acclamation, and gracefully acknowledged.

Mr. H. BUSSELL said if the Town-hall were to be used as a Corn Exchange, £10 a-year would be required to meet expenses. He proposed that dealers should pay 10s., and farmers 2s. 6d. a-year, to make up that sum. At the suggestion of Mr. Reynolds, he added that the hours for transacting business should be from 12 to 2.

Mr. WYLIE seconded it, adding as a corollary that the money for the hall should be paid in advance, because, though the dealers were very liberal, the farmers didn't like parting with their money (laughter).

This terminated the proceedings.—*Hereford Times.*

## THE PRICE OF GUANO—COPROLITES.

The recent advance in the price of guano which the agents of the Peruvian Government have deemed themselves justified in making by the state of supply and demand, has caused no little discussion at market-places and farmers' clubs, where, when guano was first introduced into the country, it was derided as all theory—a mere powdering of the land; and the conclusion generally arrived at was, that there is nothing like muck. While, however, the farmers lament this advance for their own sakes, they very candidly admit that the seller has the same right to take advantage of the state of demand and supply of guano as the farmers have of a short supply and brisk demand for wheat. This advance in the price of guano is suggestive of many important reflections. Amongst these, it shows the necessity of using every exertion to utilise the sewage of our towns, and the importance of that commission recently appointed for the investigation of that question—a commission which ought to have been appointed many years ago.

As a compensation for this rise in the price of guano comes the announcement of extensive deposits of phosphatic nodules or coprolites having been discovered in the green sand of France. Our farmers may then sleep in their beds without being haunted with the dread of losing their turnip crop a year or two hence, from the absence of guano, the want of which in some districts will be enough to throw all their lands out of course. Knowing the present general state of French agriculture, we have little doubt that we shall obtain a fair share of these coprolitic treasures of France. Ours is the best market for muck, as well as most other things, and to our market therefore the muck will come. Let us carry our thoughts a little up the stream of time, about coprolites and green sand.

About the close of the last and the commencement of the present century, attendants at agricultural meetings might have seen a sturdy, plain-looking, but intelligent man, with a thoughtful countenance and a hearty laugh, without gloves, which he spurned, and dressed in the style of a farmer of that day, with large metal buttons on his coat as big as half-crowns. He might be seen descanting to any knot of hearers who would listen to him, about there being a regular order of strata, or beds laid one upon another, which he illustrated by the slices of bread and butter resting in an inclined position in a plate, and containing characteristic fossil-shells, by which different parts of the series were distinguishable. He talked of the chalk and green sand, the gault, the Kimmeridge and Oxford clays, and other strata. The majority of his hearers turned away with a smile of disdain, if not a loud laugh, at these wild and visionary theories. To do Smith himself justice, he was as ready as any one else to denounce as theory what he was not himself convinced

of or had not seen; and we remember being startled at the meeting of the British Association at Dublin, where Dr. Smith, for they gave him an honorary degree, declared that fire had nothing to do with a volcano. He had seen the oolite; he had not seen a volcano. A few of his hearers thought there was something in his views; and when an intelligent land-agent heard him describe the influence of the outcropping ridges of stone and clay on the agriculture pursued in Wiltshire, he exclaimed, "That is the only way to learn the true nature of soils." Now Smith's discoveries are admitted as accomplished facts by the practical men who in his day would have pronounced them all theory. Some of them have even carried these views farther than Smith himself, and have pronounced that they can lay lands by a geological map; in which case we can only say, either the landlord or the tenant must go to the wall.

Smith knew the difference, however, between the regular strata and that loose covering of clay, sand, and gravel spread over them to various depths, and covering the greater part of the country, except on certain elevations and forms of surface. To these deposits Smith gave the name of "diluvium." We lately stated it was the great Cuvier; but Professor Phillips, the nephew of Smith, ascribes the origin of the term to his uncle. Cuvier, Smith, Sir James Hall, and others, saw in these beds of sand and gravel, and the transported blocks which accompany them, evidence of aqueous action different from that which had produced the regular marine strata, and they ascribed it to the passage of a transient flood over the land. Nothing very practical here, certainly; but we shall see that great practical results have flowed from these investigations.

We have described, on a former occasion, not the theory, but the fact of the accumulation of these deposits, and of the erratic blocks which accompany them over certain latitudes of Europe and America. The submergence of the land beneath the sea is proved by the presence of marine shells, most of these species now living, and extending up to heights of nearly 1,500 feet, as far as regards marine shells in the superficial deposits. Erratic blocks, transported from the north, occur up to much greater heights.

When Buckland was collecting evidence of the formation of this diluvium, now called drifts and erratic tertiaries, upon a terrestrial surface, he conducted those researches which we have described in former articles.

To the denuding process while the land was emerging, and the re-arrangement of the materials, as well as to certain peculiar characters which cause the deposits of icy seas to differ from other marine strata, may be traced the error of this having been only a

transient submergence. The fact of the surface of Britain having been submerged, is stronger than it was when these deposits were called diluvium. A change of name has taken place, no change in the proof of submergence.

When Buckland was collecting evidence of the existence of a former terrestrial surface beneath the diluvium, he found that evidence, which we have before described, of these caverns having been dens inhabited by hyænas; he produced balls resembling in shape the fossil feces of the living hyænas, and containing, like them, phosphate of lime, derived from the bones which they had crunched and swallowed. Great was the merriment which these investigations respecting the fossil dung of extinct animals occasioned. "What is the use of it?" cried some. "Buckland won't last for ever," said one of the University Dons, who did not like these new studies; and the Dr's. mounted class were riding over hedge and ditch, and blowing a horn when the professor stopped to lecture. "Buckland," said they, "won't last for ever; and there will be an end of geology when he is gone."

Poor Buckland is gone; but his once-despised copro-

lites have risen into as great importance as the then equally despised investigations of Strata Smith. He found them not only in the bone caverns which had been frequented by hyænas, but in certain marine strata, where he proved them to be the fossil feces of certain fishes, by evidence as conclusive as that which connected the coprolites of the caverns with the hyæna. Professor Henslow found coprolites and other phosphatic nodules, forming layers in the Suffolk crag: they were soon pounced on by the makers of superphosphate of lime. Liebig had shown that the manuring powers of bones arose from their phosphoric acid, not from their fat and animal matter. He had recommended the application of them in a dissolved state: the Duke of Richmond acted on the hint, and reduced it to practice. The manufacture of superphosphate followed: and fortunate does the landowner consider himself who can find on his estate a bed of this once-despised coprolite.

All this has arisen out of the researches of Smith and Buckland, denounced as they were at the time as all theory, unworthy the attention of practical men.

## THE LEATHER TRADE.

Among the necessaries of civilized life, shoes and boots are a somewhat important one; and, when the shoe pinches, it is desirable that we should ascertain the why and the wherefore.

The boot and shoe trade are holding meetings throughout the kingdom to consider the propriety of advancing the price of their commodities, in consequence of the extraordinary and continued rise in the price of leather. It would seem, then, that the demand for leather has outrun the supply; and there are but few substitutes that can be brought in to take its place. During the past year or two there has been a rise in some descriptions of leather, amounting to from 50 to 75 per cent., while the advance in raw hides is equal to 400 per cent. Increased demand for boots and shoes both at home and abroad is, no doubt, the main cause of this advance. The United States have gone most extensively into the manufacture, and monopolizes the lion's share of the hides produced throughout the world. France has to a great extent given up wooden shoes, and taken to the manufacture of leather ones; and of a very superior class too: where one or two pair in the year formerly sufficed, half-a-dozen pairs are now used. The prosperity of the kingdom in the past year was such that all our manufactures progressed extensively, and the export of boots and shoes was 80 per cent. beyond that of the previous year. Population increases too even more readily than cattle, and the Government demands for the war were considerable. It appears, then, that the supply of hides of home produce and of foreign import is altogether inadequate for the manufacture of leather, to meet a vastly-enlarged consumption, which has been gradually increasing, whilst the import of hides has been almost stationary for several years, and much less than it formerly was. The average import of tanned and untanned hides during the past fifteen years has scarcely been much over 600,000, although in some few years they have touched 800,000, and this is not above half the quantity taken for consumption by the United States; exclusive, in each case, of the home supply from slaughtered cattle.

The expenditure of the population of the United

Kingdom has been estimated at £15,000,000 per annum, a very low figure, for at least two pair of shoes to each pair of feet may be calculated on; those who wear more making up for the infants in arms and barefooted lads and lasses. The latter must now, however, be very small; for all can muster a pair of brogans for show at least, if not for everyday use. Moreover, the applications of leather are numerous for saddlery, harness, and a variety of economic purposes. The value of the leather manufactures exported was only £600,000 in 1851, now it is three times that amount. While we ourselves ship boots and shoes to a very small extent, we are good customers for a superior-made article to the continental manufacturers, from whom we take, on the average of years, about 700,000 pairs of coverings for the feet, of various kinds; besides the coverings for the hands, with which they supply us also in such large quantities.

To proceed now to the statistics of the trade. Messrs. Powell and Co., in their last circular tell us that so great a revulsion in the value of leather and hides in so short a period as the last half of the past year, and especially in the last month (December), has never before been recorded. Stocks have been gradually diminishing, and prices advancing at an accelerated pace, so that many articles of leather are now 4d. to 1s. per lb. above the quotations of June; while in raw goods a nearly similar advance has taken place. The chief cause of this unprecedented advance arises not so much from deficient production as increased consumption. There is no precise data as to the hides we obtain at home; but assuming there are 1,000,000 from the slaughter-houses, and adding the imports, we are barely on a par with the United States foreign imports in the hides available for manufacture; and must therefore be largely behind in our shoe manufacture in quantity, however superior in quality.

Messrs. Boucher, Mortimer, and Gale tell us that foreign countries from which a few years since large imports of leather and hides were received now experience a scarcity equal to our own; and, in place of supplying us with any surplus of their stocks, are



keenly competing with us for hides in the producing countries. The export of leather manufactures has been large beyond former precedent, and has assisted, with a brisk demand at home, to produce the activity which has now for some time cleared the markets of every fresh lot on arrival; and at no former period were stocks in tanners' or factors' hands ever so light as at this moment. Thus we have entered upon another year with no stock of hides, with unusually short stocks of leather at market, with a greatly increased consumption, and with the trade of the country in a healthy and prosperous state. The United States are now our principal competitors in the foreign markets for hides, and they bid fair soon to engross all the supplies from the Central and Southern American ports.

At New York extreme rates are also now obtained; and, with a deficient supply, the stock on hand is reduced very low. The total imports of all kinds, these including about 26,205 South American horse hides, were 1,780,317 hides last year, against 1,544,124 in 1855. The stock of hides on hand was only 6,236, against 49,192 in 1855, and 63,200 in 1854.

In four years the imports of hides into New York has increased by half a million; and yet the supply is inadequate.

In comparing the imports at New York for the last two years, we find that, while there was a decrease in the imports from Angostura of about 100,000, from nearly all the South American ports there was a very large increase. From the River Plate the imports have trebled over 1855, reaching to nearly 700,000 hides. They have also drawn large receipts from Chili.

The State of Massachusetts is noted for its manufacture of boots and shoes, and some idea of the magnitude of this branch of trade may be formed from the fact, that there is made there every year, nearly two pairs of shoes for every man, woman, and child in the Republic. Not that all these are locally used—a large export trade being carried on to the southern and western States, the West Indies, South America, Australia, Europe, and other quarters. At the five principal American ports, New York, Baltimore, Boston, Philadelphia, and Salem, the consumption of imported hides has averaged in the past three years 2,600,000 hides, equal to 5,200,000 sides of leather. And, if we had the necessary data to compute from, we should find this was far below the real quantity. For instance, Philadelphia made 500,000 sides of leather by the official inspection in 1855, while the consumption of foreign hides was only 100,000; so that 150,000 more must have been derived from the slaughter-houses.

In Australia and India there is also an increasing local consumption for shoes, harness, &c.

We cannot estimate very closely the Continental consumption, but the imports of hides into Havre, which may be taken for all France, in the last few years have been as follows: 1852, 430,000; 1853, 309,000; 1854, 314,000; 1855, 586,000. Last year's return not yet received. The increased imports were also accompanied by a rise of prices from 15 to 20 per cent.

The details given above will serve to account in some degree for the deficient stocks and advancing prices, and prove to the grazier and breeder that the hides as well as the flesh and tallow of his cattle are in increasing demand, and bid fair to realize even more remunerative prices.

## G R A S S E S.

A PAPER READ BEFORE A WEEKLY MEETING OF THE COUNCIL OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND, HELD ON THE 26TH MARCH, 1856, "ON THE CULTIVATION OF GRASSES."

BY J. W. CALVERT, M.D.

The subject, to which I have long felt anxious to call the attention of this Society, I purpose treating under the following heads:

- I. An examination into the supposed difficulties experienced by agriculturists, from the want of a sufficient botanical knowledge to enable them to lay down their tillage-land to the greatest advantage, into permanent meadows and pastures.
- II. The difficulties to be overcome, in consequence of the foulness of the ground, from slovenly habits, in allowing weeds to grow up and shed their seeds from year to year, apparently sanctioned, or at least disregarded, by all classes of British agriculturists; whereby the greater half of the land is occupied by worthless herbage, the produce of the desired crops reduced below one-half of what they otherwise might be, and the quality much deteriorated.
- III. The difficulties arising from the ravages made upon the seed-crops of many of our best grasses by a species of grub or caterpillar, called by Curtis the *Noctua cubicularis*.
- IV. The difficulties arising from apathy and indifference on the part of those who have the means, and might, by example and precept, encourage the superior culture of our meadows and pasture-lands, so as to produce at least double the present amount of nu-

triment for their stock, which the land is capable of doing, if kept free from weeds, and laid down with properly-selected clean grass-seeds only.

- V. The difficulties attendant on ascertaining what are the kinds of grasses best adapted for permanent pastures and meadows in ordinary situations and soils, and which ought to be rejected as unprofitable or detrimental, either from their tendency to impoverish and exhaust the land, inducing foulness by their creeping roots, or by occupying the ground where better grasses would otherwise grow.
- VI. The difficulty of obtaining seed of the best species and varieties of grasses for permanent pastures and meadows, without admixture of weed and inferior grass-seeds.
- VII. A summary of the preceding articles, with comments and suggestions, particularly in regard to the state of the land to be laid down, and the treatment of the growing seeds, so as to secure complete success.

### J.

Before proceeding to exhibit the grasses now lying on the table, it will be necessary to premise some general observations, which will be more of a practical than of a scientific character; for I do not profess to have studied the science of botany sufficiently, so as to qualify me to give definitions of the different varieties

to which I have for many years been paying special attention. They are very numerous; and in regard to grasses, in particular, botanists do not appear to have given themselves much trouble to ascertain and define them, so as to inform the general reader, student, or agriculturist how to distinguish one from another. For instance, *Festuca duriuscula* is a name generally applied to almost every slender-leaved fescue; and the seed is sold by seedsmen accordingly. I have a specimen here, and I think no one will deny that it deserves that name; for, happening to have a field in which little else was to be found; I have had practical experience of its resistance not only to loaded carriages passing over it, but also to the scythe, which would lose its edge before half-a-dozen strokes had been made, to cut it for hay. It will not, therefore, create surprise when I state that stock only eat it when urged by hunger.

I observe, in the 15th vol. of our *Journal*, page 462, we have a "prize essay," article XVIII., on "The Natural History and Agricultural Economy of the British Grasses," by James Buckman, F.G.S., F.L.S., &c., Professor of Geology and Botany in the Royal Agricultural College (Cirencester). He says: "The importance to the agriculturist of a knowledge of the pasture or the meadow-grasses which are everywhere found in the fields, is now so generally recognized, that little need be said to enforce its value." He adds: "But, however much a knowledge of this useful tribe of plants may have been desired by the agricultural inquirer, yet he has been repelled from its pursuit by the difficulties ever attendant upon distinguishing genera and species of large vegetable families, without which, little progress can be made." Such a declaration from a professor in a public agricultural establishment appears to me unnecessarily discouraging to the agriculturist. That there are difficulties in discriminating one genus, species, and variety of grasses from another, I know from experience; yet I am not of opinion that it is necessary that an agriculturist must first study botany, before he can expect to make progress in obtaining much useful knowledge in respect to the names, qualities, and productiveness of such grasses as may be esteemed the best fitted for permanent pastures and meadows; nor do I think, from what I can discover in this prize essay, that the Professor himself has reaped the advantages he would lead us to expect from his acquisitions in the science of botany. In confirmation of what I am now presuming to state, I will give you what he says about ryegrass (at page 472): "Though a number of plants—not grasses—are cultivated as seeds or 'artificial grasses,' it is quite unnecessary to remark that these are altogether distinct from the true grasses. Of the latter, only one species is used to any extent in seeds—namely, the *Lolium perenne* (perennial ryegrass). Of this there are several varieties derived from cultivation, the best of which is the Italian ryegrass. Now these two varieties—namely, *Lolium perenne* (common ryegrass), and *Lolium perenne*, var. *Italicum* (Italian ryegrass)—possess highly valuable properties. They yield nutritive food, and have an upright mode of growth; so that, while adding greatly to the weight of the hay, they interfere less than most other species with the surrounding herbage: but as they are now universally grown from cultivated seeds, there is in them a tendency to changes which are not for the better. This may be shown by attention to the habits of the *Lolium perenne*. In wild nature, we see that this grass is perennial in habit: hence, in depasturing its green herbage, it stools out very considerably. In cultivation, however, it grows straight, upright, coarse culms, which, when flowered, are cut down for hay. It then has a less tendency to 'tiller' or 'stool'; and much, consequently, dies for the want of living shoots to keep up

its vitality. Now this is a tendency that increases, and must increase, until this plant becomes more of an annual than a perennial; and indeed, in some districts, it is at present next to impossible to get a crop a second year. This, however, may in a great measure be prevented by early cutting of the grass, when for hay; and here it is proper to remark that there can be no greater injury done to a grass crop, whether *natural* or *artificial*, than the letting it get too ripe before cutting."

Now, if any of the committee who awarded a prize for this essay, or any other gentleman now present, understand the Professor's doctrine respecting the habits or peculiarities of ryegrasses, I should feel indebted to him for an explanation, as it is to me quite incomprehensible. He appears to say that the perennial ryegrass may become Italian ryegrass by cultivation, and by further cultivation will become an annual, and die away altogether. As I shall have occasion to recur to the habits of ryegrass, it would be out of place to offer further comments on this subject; but I will, with the permission of the Council and members here present, proceed to point out the difficulties which I consider have so long retarded the progress of improvement in our pasture and meadow crops, both in regard to quality and quantity of herbage.

I have already admitted that there is a difficulty in distinguishing the different genera, species, and varieties of grasses, even with professed botanists themselves. For instance, Sinclair gives a plate of the Reedy Sweet Grass, to which he attaches the name of *Poa aquatica*, but in his description of this interesting water-grass he calls it *Glyceria aquatica*; again, the *Festuca sylvatica* he describes under that name, yet in the index you are referred to *Bromus sylvaticus*; some botanical authors referring the same grass to one genus, while other authors refer it to another.

The plan which I have adopted and pursued for about twenty years has been very simple, and yet has proved far more successful and satisfactory than I had any reason to anticipate at the commencement of my researches; I mean to say, only as far as relates to discovering and cultivating a numerous variety of grasses possessing superior qualifications for culture to those generally met with in pastures and meadows, not only in regard to quantity and quality of herbage, but also in reference to the limited space of ground occupied by their respective roots, as well as seed-culms, instead of spreading far and wide to the detriment of other plants growing near them, occasioning the ground to be foul and expensively cultivated when under tillage. I have therefore rejected all plants with creeping roots, and selected such only as have abundant upright tender herbage.

It has been my practice to make use of a spud, when in the country, for a walking-stick, and whenever I met with a grass decidedly surpassing in herbage those surrounding it, I took up the whole plant with my spud, and transplanted it on one of my experimental grass-beds, making rows of each sort, so that I could watch their progress and judge of their comparative merits, selecting the seed from such as I deemed the best adapted to my views.

The first grass which particularly struck my attention was a beautiful green slender-leaved fescue, growing in an old limestone quarry: its great superiority over the surrounding grasses was remarkable. I at once determined upon collecting the seed from it, when ripe, and then sowing the same alone on clean ground; on looking for it, however, some time after, I found the grass lying flat on the ground, but the seed-culms had disappeared. Resolving to cut the grass and transplant the roots, I found the seed-culms and seed completely buried beneath and among the foliage. The result after sowing the seed was so satisfactory, that I began to look out for other

superior stray plants, and was fortunate in finding many which proved equally satisfactory. Having first transplanted them on my experimental grass beds, where their respective merits could be tested, such as proved inferior or unsatisfactory were taken away. On one occasion I found a beautiful slender-leaved fescue on an exposed piece of ground, which had been lately enclosed from the Lingy Moor; it was, however, growing near the new stone wall, at an elevation of probably not less than 700 feet above the level of the sea, where what Sinclair terms Mountain Grasses only could be looked for. I mention this circumstance to show that the idea of high ground being incapable of producing superior grasses is erroneous; but that they want succulency, are dry, and deficient in their natural flavour, I admit, unless sheltered by plantations, hedges, or walls. But where they are so sheltered, my selected grasses are now luxuriantly growing at an elevation estimated at not less than 600 feet, and are green and succulent long before and after the inferior grasses are brown and injured by the frosts; indeed, I have varieties of slender and tender-leaved fescues, which are as green at Christmas and in the early spring as any grass on the ground at the most favourable season of the year. Although, to a superficial observer, there may be little or no visible difference in many, especially of the slender-leaved fescues, yet on closer inspection there may be discovered in the different specimens, which are very numerous, a considerable variety in the green hue of the leaves, as well as in the abundance of what is termed bottom-grass, when in flower or seed; also in the flavour when masticated. A great difference will often be found on examining the roots, some having almost hair-like filaments, while others will be coarse and very differently disposed; some striking deep into the ground, while others take more superficial hold, sending up off-sets just clear of the parent plant, and in that way filling up the surrounding bare unoccupied spaces. A difference is often observed in the colour of the seed-culms or straw when becoming ripe, having different hues of pink, yellow, or white. A very perceptible difference may often be observed in the arrangement of the heads containing the seeds, each retaining its distinctive character, although growing in rows so near together as sometimes to touch each other at their tops, especially when beaten down by heavy rains, without sporting or becoming hybrid. One curious and interesting instance to the contrary I think it right to mention here. I sowed some awned fine-leaved fescue seed (I believe the *Festuca myurus*, or Wall-fescue of Sinclair), which is an annual, by the side of the fescue which first attracted my attention, as already described; to my surprise, I found the seed of both sorts were alike awned. I preserved and sowed them both on separate beds, and found the produce to be the *Festuca myurus* only on both beds—both annuals. I had therefore all the awned fescues removed, after which the seed produced from the same perennial plants was without awns, and in no way contaminated, as shown in succeeding crops grown from it. I could not discover that any other variety of fescue could be contaminated by growing near the *Festuca myurus*. I have made these statements as a hint that one sort may be better adapted for one soil, situation, or climate than another; so that we cannot decide on inspecting the seed, or even the plants themselves, while growing in a certain situation or soil, which sort will be the best adapted for another situation or soil.

In order to be more clearly understood, I will state concisely a case in point, as it has occurred to me, on one of my trial grass-beds. No. 14 surpassed all the others in being the earliest and the most productive: I therefore considered it at the time the best grass of the whole; but on sowing the seed of each sort in other

parts of the same field, Nos. 9 and 6 particularly surpassed it in quantity of produce, and there did not appear to be any decided difference in the time of the seed coming to maturity. In repeating the experiment with the same and other sorts, in another part of the field, I found not only No. 14, but also Nos. 9 and 6, had been surpassed by some other grasses, which before had not particularly shown their superiority, notwithstanding all were of greatly superior sorts to those generally met with. The safest plan, therefore, will be to have a considerable variety, as by change of culture certain varieties which may have escaped observation may spring up into healthy growth or luxuriance, while others, previously conspicuous, under altered circumstances have been supplanted, and have disappeared till again brought forward by some adventitious circumstance favourable to its development.

The soil of my experimental grass-field is rarely found to be alike for twenty yards together, varying from a peaty soil, modified by cultivation, and lying over a subsoil of a peculiar sort of gravel in places, having below it a bed of sandstone, which appears to be a consolidation of the superstratum into substrata of still larger blocks beneath each stratum; in other places the subsoil is a stiff clay, which, as well as the gravel, is reached by the plough in patches; while elsewhere, by deep ploughing, the soil is changed from black to a brown light sandy loam: the whole very prolific in weeds; among others, coltsfoot is one of the most troublesome.

Sinclair says, in his "Hortus Gramineus Woburnensis," page 234: "It appears most unaccountable that at this day, when the different branches of practical agriculture seem to be so well understood, it should be asserted, and without contradiction too, that it is of no importance what kinds of grasses are sown upon lands for the purposes of permanent pasture, as Nature itself, in the course of time, will produce those kinds of grasses best adapted to the soil, and which only remain permanent. Now, as the whole art of cultivating plants is nothing more than assisting Nature in the process of the growth of vegetables, surely the above doctrine can amount to nothing more than the confession of an utter deficiency in the knowledge of the art of assisting Nature in the process of clothing the soil with its natural perennial grasses; or that, instead of three or four years, in the course of which, by the kind assistance of Art, the valuable sward may be renewed, it is better to leave it to the slow unassisted efforts of Nature, to be renewed in eight, ten, or twenty years."

"The superiority of ancient natural pastures over those formed artificially with ryegrass and clover was before alluded to. It will be found principally to arise from the variety of different habits and properties which exist in a numerous combination of different species of grass. From the beginning of spring till winter there is not a month that is not the peculiar season in which one or more grasses attain to the greatest degree of perfection. Some grasses there are that withstand the injurious effects of long-continued dry weather better than others, and *vice versa*; hence the comparatively never-failing supply of nutritive herbage obtained from natural pastures, which it is in vain to look for in those artificially formed with one or two grasses only."

Having endeavoured to show that it is not absolutely necessary that we should first study the science of botany before we can expect to make progress in laying down our tillage land advantageously into permanent meadow or pasture, as set forth by Professor Buckman, I wish now to state what I have found to be a much greater difficulty than the want of botanical knowledge.

## II.

The greatest obstacle I have had to contend with, in

the prosecution of this undertaking, has been to obtain clean ground, on which I could depend, to grow my choice grasses, without the admixture of weeds and inferior grasses, so as to allow me to collect the seeds from them in their greatest purity without extraordinary trouble and expense. In this I have been baffled, after having persevered twenty years to overcome it.

The habits of all those persons with whom I have had to deal have been such that, although my ground has been fallowed for years together, I have for the most part found—after an absence of two or three months, say from May to August—that weeds have been allowed to grow up unmolested, and shed their seeds, until the eve of my return; and considerable surprise has been expressed that I should be dissatisfied with its condition, as they considered the ground clean enough for anything. I have thus been disappointed year after year, and consequently have been put to almost incredible expenses. So long, therefore, as slovenly habits among our labouring peasantry are tolerated, and, as a matter of course, slovenly farming, it will be labour in vain for me or any one else to attempt effecting the improvements I had so fondly anticipated and so perseveringly prosecuted, notwithstanding my great success in amassing a collection of grasses so greatly superior to any I have ever seen or heard of elsewhere. The great question, therefore, to be solved is—Does this state of things admit of a remedy?

In the 16th volume of our Journal, page 142, we have Mr. Peter Love's "General Remarks on Continental Farming." He says—"I feel it my duty to give a clear and faithful record of what I saw to admire, as well as what I saw to regret, in foreign agriculture.

"On leaving Ostend," he says, in reference to the warp land, "the land under tillage is tolerably farmed (if we except the drainage and breed of stock). We then passed over some very light sandy land, with marshes along the river, which are pastured by some ill-bred stock. This district is nearly all enclosed. The cultivation is tolerably good, considering that it is nearly all done by females, who certainly keep the land free from weeds. About Cologne is a beautiful district, well farmed, with no waste land about fence sides or corners of fields, growing rubbish. On leaving Cologne for Dusseldorf," he says, "this part is well farmed, as far as the cleanliness of the crops goes, but the crops are lighter than they ought to be on such soil. We then passed through some poor hungry soil adjoining a barren heath, where the farming was clean, but the crops very light. The whole of these districts are open field. The industry displayed in keeping the land clean is indeed great. The farmers here do not allow weeds to enter into competition with their crops; a war of extirpation bids fair to free the land of the nuisance." Proceeding on his journey, he observes—"The farming is beautifully clean and neat, but all the crops were very light, except the clover, which was in many cases a capital crop. This was followed by a district of rather poor light soil, wholly in tillage; the farms large, kept beautifully clean, and not a yard of waste land to be seen. The crops, except clover, were all light. After leaving Duisberg, we came through another district of poor light sandy soil, all in tillage, except a little meadow by the river sides; the farms small, but cleanly farmed; the whole of the crops, except clover, wretchedly light, not over ten bushels of rye per English acre, and twenty of oats—peas about sixteen bushels. *About one-sixth of the land is clover*, and another sixth peas, tares, and rapeseed. The industry employed here to produce such crops is quite beyond my understanding; for it appears impossible that it can give an adequate return to feed and clothe the occupiers. Were drainage carried out, these people would make this comparatively a little

paradise. Drainage is all that is required to make these districts treble their produce; but, as far as I have seen, it appears to be totally unknown on the continent."

It would only be a repetition to follow Mr. Love in his travels; my object in referring to him being merely to show the possibility of extirpating weeds and worthless grasses, and thereby not only enhance the value of the produce, especially in the grasses, but also lessen the expense of cultivation.

There are some points in Mr. Love's communication to which I am anxious to draw the attention of the members of this society: I mean, in the first place, his remarks on the extreme ignorance in our continental neighbours of the advantages of draining, which appear to us so self-evident; and secondly, the extreme care taken by them not to allow their crops to be deteriorated in any way by weeds, the advantages of which practice are to them equally self-evident, of which, however, the English farmer seems to be as ignorant as the continental is of drainage; so that it would appear that we ought not to flatter ourselves that we possess any great superiority over these poor creatures in the cultivation of our farms.

In regard to Mr. Love's remarks on the very great superiority in our breed of stock over theirs, they will be more appropriately commented upon in another place.

The third subject to which I would draw attention, incidentally remarked upon by Mr. Love, is the abundant produce of leguminous as compared with other crops, notwithstanding the frequency and extent of their culture; but this subject I must also defer commenting upon for the present.

When travelling through Lancashire, upwards of thirty years ago, I drew the attention of the coachman sitting by my side to the extraordinary quantity of docks and other weeds covering a field we were then passing. He remarked that the occupier wanted his rent raising. I asked him what would be the effect; to which he replied, that if the man had to pay a fair rent for his ground he could not afford to grow such rubbish upon it. I felt so forcibly convinced, at the time, that his reasoning was just, that I thought the answer worthy of being considered an agricultural aphorism, and which has often occurred to me since as being applicable, not only to the growth of docks and other romping weeds, but also to an endless list of plants growing along with and occupying the places of the more valuable pasture and meadow grasses to an extent that few professors in the art and science of agriculture have the least conception of. I believe it would be no exaggeration to say that at least one-third part of our grass land is occupied by actual weeds; that another third-part consists of either noxious or nearly worthless varieties of natural grasses; and the remaining third-part of a promiscuous mixture of a better class of grasses, such as the locality in which they happen to grow or the shop of the seedsman may furnish.

There may be districts or individual farms in Great Britain, with which I am not acquainted, where weeds are not allowed to grow and shed their seeds. If such should exist, at least one-half the trouble and expense will be saved in the tillage, and more than double the value of the produce will be realized; for in light land, especially, it appears to be now generally admitted that the less it is stirred up, the better for the succeeding crops; but here weeds generally abound the most. The great question, then, is—How shall they be got rid of?

Whether we view this subject as affecting merely the agricultural community, comprehending the landlords as well as the tenant farmers and their dependants, or taken in a national point of view, it is a matter of much greater importance to the prosperity of the country than

has hitherto been calculated upon, at least as far as my researches have gone.

It would be to very little purpose for me to write, or hold forth, merely to complain of and point out the difficulties which beset us in prosecuting this subject, without offering suggestions to overcome them; and although it may appear presumptuous in me to do so, especially as my ideas differ very considerably from what is now termed the popular opinion, in regard to the employment of children in humble life, so as to fit them to learn and labour truly to get their living in that station of life unto which it hath pleased God to call them, I think much might be done at this peculiar crisis, if all the members of this society would take it into their serious consideration how much better it would be for the children themselves, as well as the community at large, if taught to be clever, attentive, and cleanly in their respective callings, and imbued with a proper sense of their duties towards God and man, through the instrumentality of Holy Writ and good example set before them (for I apprehend that, as a general rule, it is only in early life that habits are acquired, whether for good or for evil); and that if children be trained up to be cleanly, and accustomed to a course of discipline consistent with their station in life, and which need not be irksome, but rather sources of amusement, such as military exercises, gardening, &c., as recreations under proper superintendents, they would generally retain through life the habits thus acquired. I think it quite possible that, as man is more of an imitative than an instinctive animal, and in very early life takes great interest in attempting to do whatsoever he or she sees done, or rather doing, by others, that is surely the time to encourage them in those habits which may prove most useful to them in after-life; but when this opportunity has not been taken advantage of, the mind and imitative faculties become diverted into channels which may prove a curse to them, not only through this life, but to all eternity; and instead of becoming useful members of the community, may become a disgrace and burden to their connexions and their country, whether employed as domestic or farm servants, labourers or artizans. Hence the necessity of reformatory establishments, which, I presume to think, would have been unnecessary if the children of the labouring classes could be educated and disciplined in the manner I am hinting at, and which I feel anxious to recommend as being most conducive to the public good generally, and the object I have more immediately in view in particular, i. e. in obtaining the means of freeing our soil from worthless rubbish, and substituting valuable products in its stead.

Supposing that instead of erecting union work-houses and reformatories in the immediate vicinity of large towns, they had been built in the middle of large farms or tracts of land, and that a farm bailiff and other qualified superintendents of good character in the various departments of labour, including the teaching of reading, writing, and arithmetic, as well as the management of horses, horned cattle, sheep, pigs, &c., but more particularly neat gardening, with prizes to those who should excel in neatness and freedom of weeds in particular, in their respective allotments, the advantages must be obvious.

The whole plan might be so arranged, that field-labour and gardening might be attended to in favourable weather, while scholastic and military exercises, as well as many other necessary operations, might be carried on under cover in foul weather, so as to keep the mind and body always beneficially employed.

It may be easily imagined that youths taken from such an institution, so trained, would at once become useful servants, and that reformatories would not be needed. It would be considered too great a digression for me to point out the many advantages that we might

expect to derive from such a system, in point of economy to the nation, independently of the many comforts which all classes would experience in the more cleanly habits and other superior qualifications of their domestic as well as farm and other servants.

### III.

The next difficulty I have had to encounter has been, the ravages made among some of my best grass seeds, by grubs or caterpillars, which pierce the seeds during the time of coming to maturity, devouring the kernels, as may be seen in the specimen contained in the phial No. 1. It is the seed of the taller fescue (*Festuca elatior*) for which they show a decided preference, while the seed of the darnel fescue (*Festuca loliacea*) will sometimes escape altogether, as may be seen in the other specimen contained in phial No. 2.

Ten or eleven years ago, I found my wheat crops, in Yorkshire, for the first time very much infested by grubs or caterpillars, which pierced the grain while yet in a milky or soft state, continuing their ravages to a serious extent, till the corn was gathered into the stack. I also discovered that the same sort of insect had attacked my grass seeds, particularly the fescues. In the year following I calculated that at least one-third of my crop of wheat was devoured by them, and the samples completely spoiled, a considerable portion of the grain being partly eaten. Feeling alarmed at this circumstance, I brought specimens of the caterpillar, &c., with me to London, and showed them to Mr. Curtis, who told me that he had met with some specimens in Suffolk, and had taken a drawing of one, which he showed me, and which was afterwards copied into the 5th volume of our *Journal*, page 505, and which he calls *Noctua Cubicularis*, together with an ear of wheat pierced by them, and also a moth which he supposes to be the parent of the grub. (Figures 15, 16, 17, and 18.) I showed him a specimen of what I considered to be the parent, because I always found them in company together; but I never could find in Yorkshire a specimen of his moth. I have brought two or three of what I yet feel disposed to consider the parent of the grub.

On enquiring of my tenants if they were suffering from the same cause, I could not learn from any one of them that they had ever observed these grubs or caterpillars. They appear to be on the increase with me, from year to year, but not regularly so. When the grass seeds are brought in from the field, and shot out from the bags, a few pounds of seeds will contain some scores of these insects, so that we cannot do otherwise than suppose that they must seriously injure them. Although they have annoyed me much, I think it very probable that other districts may be kept freed from them by birds, which may feed upon them. I believe we have no birds with us of that description. It may be inferred from the damage sustained by the seed of the taller fescue, that it would be in vain for me to persevere in growing these grasses for seed in the same locality, the last year having been particularly favourable for the growth, maturing, and housing the grass seeds generally; yet I do not recollect to have seen the seed more pierced than it was last autumn.

### IV.

The next difficulty I have experienced in prosecuting my intentions has been, the extreme apathy or indifference of the agricultural community, of every grade, in regard to laying down their tillage land to the greatest advantage for permanent swarth. They appear to consider it satisfactory if the land, after being sown with grass-seeds, be well covered with green herbage, without giving themselves the trouble to inquire into the quality or permanency of each sort, or their fitness for the purposes intended. Indeed, I have scarcely ever attempted

a conversation on the subject with any one, whether landlord or tenant, who has not quickly shown a decided disposition to change the subject of conversation; so that, notwithstanding the progress that may have been made in most other arts and sciences, during the last century, the question is, whether that of laying down tillage land for permanent sward may not have retrograded; for it cannot be denied that we do not now produce pastures and meadows equal to those which have been laid down by our forefathers. I think the explanation not difficult. I believe the introduction of rye-grass has been one great cause, by its great powers of monopolizing to itself, and exhausting the land of, the greater part of the nutriment which may have been left in it by the corn crop, upon which the seeds have been sown.

In order to show that it will be labour in vain, and an absolute waste of seed and money, to attempt to form a good permanent sward, if rye-grass be sown along with the better and more permanent grasses, I will mention a few cases in point. Some years ago I received some seed of the *Alopecurus Tauntonensis* from the late W. P. Taunton, Esq., which I sowed on a bed prepared for the purpose; but the wind being high and the seeds light, some of them were blown away to another grass-bed adjoining. To my surprise, instead of foxtail, rye-grass only came up; excepting on one small patch, where there was no rye-grass, a few puny plants of foxtail made their appearance; but on the adjoining bed, where some of the seeds had been blown by the wind, some fine healthy plants of foxtail were growing. On the following year, the same kind friend sent me a small packet of what he believed to be, the *Festuca heterophylla*, which I sowed. In this case also, rye-grass only came up; but, as soon as I perceived what it was, I pulled it up; after this some weakly plants of the fescue made their appearance.

On my last journey into Yorkshire I met with a reverend gentleman, with whom I had some acquaintance, who told me that a neighbour of his, having sown down a field for permanent sward with grass-seeds obtained from his seedsman, but falling short of seed a portion of the field remained unsown with grass seeds; but that now, some years having elapsed since the sowing, the other portion of the field has become the best sward. He wished to know what explanation I could give. I told him the explanation was by no means difficult. He must, in the first place, recollect that competition with seedsman could only be carried on by a liberal supply of rye-grass, and where that was sown little else need be looked for; and as it was a great exhauster of the soil, it would soon die away, unless abundantly supplied with manure. That, in the case he had just alluded to, doubtless the seeds sown contained rye-grass, which had exhausted the soil, so that when the rye-grass died away, there was little or nothing left; whereas, on the land where no rye-grass had been sown, the grass-seeds which might be scattered from the hedge and other sources would find a more fertile soil, and though it would necessarily be of very moderate quality, this ground would of course be the best covered with herbage.

The idea that good grasses will spring up spontaneously, without superior and clean seed having been previously deposited on the land, is too absurd to be entertained at the present day, whatever may be the nature, situation, or fertility of the soil; for with all our care weeds will spring up, as well as creeping-rooted and other inferior grasses, shed their seeds, and produce their like, unless interfered with by proper culture. It is too much to expect that Nature will make a more judicious selection for our wants than we can do for ourselves. If we take indiscriminately the

sweepings of our fodder-rooms, we cannot reasonably expect grasses to spring up of a superior quality to those from which the seed was derived. If we apply to the seedsman, they, in the exercise of their calling, will of course send you such as they possess, and as long as their customers are satisfied they will naturally be so too. This question, therefore, naturally presents itself: Whose fault is it, that, under the auspices of the Royal Agricultural Society of England, no progress whatever appears to have been made since its establishment in improving the cultivation of what may be termed "the staff of life," in relation to the support and feeding of our stock?

In the second part of this paper, relative to weeds, I spoke of an agricultural aphorism, viz, that when a farm became overrun with weeds, it indicated that the tenant is not paying a fair rent, or he could not afford to grow such rubbish upon it. On due consideration, however, and a better acquaintance with the almost insurmountable difficulties which a tenant has to contend with, I feel constrained to apply the same kind of logical reasoning that has been recorded as used by the wife of a culprit when brought before a magistrate in one of our midland-county boroughs, noted for the part it had in accelerating the passing of the Reform Bill. The culprit, being reprimanded for not paying proper respect to the magistrate, replied, with a sneer, "Magistrate, indeed! why he's nowt but a shoemaker." The poor wife, in great trepidation, exclaimed: "Nay, my dear luvvie, don't talk o' that how; thou knows they can only mack magistrates o' what they've got to mack 'em on!" In like manner the tenant can only sow such seeds as he can obtain from the seedsman or the fodder-room, for the defects of which he may not be answerable. The same question then recurs, Who is in fault?

If we look over the lists of grass-seeds recommended by our first-rate seedsman, of what do they consist? Taking them alphabetically, we find, among a very thin sprinkling of passable grasses, the following:—

*Agrostis*, or creeping bent grass, called "wicks" or "wickens" in Yorkshire (*vide specimen*).

*Arrhenathum avenaceum*, called in Yorkshire "knot-grass," the vilest of all light-land wickens (*vide specimen*).

*Festuca duriuscula*, hard fescue (*vide specimen*).

*Lolium*, improved ever-green } Rye-grasses

*Lolium*, dwarf-spreading variety } (*vide specimens*).

*Poa pratensis*, smooth-stalked meadow-grass (*vide specimen*)—with a creeping root, a wicken or couch grass).

*Poa annua*, annual meadow-grass (*vide specimen* &c.—with innumerable wide spreading roots).

*Poa fertilis*, fertile meadow-grass (*vide specimen*)—a more formidable creeping root than the *Poa pratensis*).

I do not hesitate to say that the man is unfortunate who happens to have his land infested with such rubbish as the grasses just enumerated, because they are so difficult to get rid of, either on account of their creeping roots, or the frequency or abundance of their seed shedding, or on account of their great powers of exhausting the soil, and therefore supplanting and occupying the places of better grasses.

There are others of little intrinsic value of themselves, and which may also be found in Professor Way's list of grasses, of which he has apparently with great care and attention given us the analyses, and which may be found in the 14th volume of our *Journal*, beginning at page 171. But, as I suspect, very few, if any agriculturists would, if duly aware of their habits and qualifications, permit any one of them to be sown on their land, whether for rotation crops, or for permanent sward; it becomes, in that case, questionable what advantages

this society, or the agricultural community, will derive from the analyses of these grasses, however accurately ascertained. Had the Council, or Professor Way himself, applied to me for specimens of my best grasses, I should have gladly availed myself of the opportunity of furnishing them, free of any other expenses than those incurred for the carriage of the parcels.

I think it a matter to be much regretted that such valuable experiments in regard to the proportions of albuminous and other important constituents of food should have been wasted upon so much worthless rubbish; while we still remain ignorant of the most valuable constituents contained in many of our best grasses: I mean, more especially, such grasses as yield a great produce, and are preferred as food by stock; for instance, the most productive varieties of the Fescue genus, which are very numerous—Alsike clover, the best varieties of bromegrasses, &c. (*vide specimens*). But I now find myself anticipating what more properly belongs to the next division of my subject. One thing, however, I perhaps ought to mention here, which is, that it is of little importance whether certain sorts of grasses contain much or little albuminous matter, if the stock will not readily eat them.

I had once a stack of beautifully green, sweet-scented hay, but which consisted in a great measure of the tribe or rather genus of *Agrostis*, or bent-grass, and of *Holcus*, or soft grass, &c; but the stock would not eat it: consequently it was used as bedding or litter. But when hay made from superior sorts of grasses was offered to them, although considerably damaged by the weather before being put into the stack, it was greedily eaten.

From what I have already stated, it appears quite evident that a deplorable want of agricultural knowledge in regard to this department of agriculture is universal; for whether we refer to individuals who make pretensions of superior practical knowledge, or to professors and teachers of agricultural science, or even to those of this Society on whom the awarding of prizes devolves, we cannot shut our eyes to the want of judgment displayed in their recommendations and decisions, which are more calculated to mislead than to instruct, and of which I can readily furnish instances.

In a pamphlet which I wrote in 1850 (published by Herne, in the Strand, entitled "The Merits and Tendencies of Free Trade and Protection respectively investigated," and of which there is a copy in our library), I extracted from *Bell's Weekly Messenger* an inquiry by a Suffolk farmer what grass-seeds he ought to sow, he wishing to lay down land into permanent swarth; to which inquiry the following answer was given by an Essex farmer:—"Some persons prefer laying down without corn, but I have generally drilled in two and a-half bushels of oats per acre, sowing by hand afterwards three bushels best Pacey and half a bushel of Italian grass-seed per acre, mixed well together, and then, by engine, 6lbs. of Dutch clover, 3lbs. trefoil, and 3lbs. cow-grass, mixed, harrowing them well in so as to cover, and rolling the land down; by this method I have obtained a good plant of seeds, with a fair crop of oats." This production, I believe, needs no comment.

I perceive that time will not allow me to refer again to professor Buckman's prize essay on British grasses, which it was my intention to have done; but, as a further illustration of what I have advanced, I wish to refer to another prize essay on the management of grass land by Mr. Robert Smith, contained in the ninth volume of our *Journal*, beginning at page 1.

The chief anxiety of Mr. Smith appears to be, from its frequent repetition, that the "fog, or surplus summer grass," should be cleared away at least once every year. He goes on to state that "the grasses are really

indigenous productions formed upon an accumulated mass of vegetable mould, and are of themselves sufficiently rich without the aid of manures; they require, however, to be kept in proper bounds, that every remaining blade be allowed to see the sun at least once a year, otherwise an accumulation of rough grass takes place, and the herbage becomes degenerated, changed in character, and less nutritive in quality: hence we often hear parties remark that certain fields have lost their feeding qualities. This results from the fact, that while the annual produce of the soil is chiefly exported in the shape of beef, mutton, &c., and no return of manure is made to the soil, the grasses themselves have been allowed to be choked with superfluous rubbish, and not even permitted to adjust themselves according to 'Nature's course.' The importance of assisting Nature rather than marring her works is forcibly shown in this." Mr. Smith adds, that "many graziers prefer to 'skim' these pastures over, thereby checking the rough bunches and grasses that predominate, and giving a more even pasture to the succeeding cattle."

All that I need remark on this subject is, that on one occasion I saw a remarkably fine root of cocksfoot-grass growing unmolested towards the middle of a bare cow-pasture; I directed that a handful of salt should be thrown upon it. In about a fortnight after I inquired after the cocksfoot, and I was informed that the cow had eaten it up. On another occasion I found some ears of barley growing among other coarse herbage in a heavily-stocked homestead, to which I recommended a sprinkling of salt, which I doubt not would be attended with the same result.

As, I presume, the establishment of the Royal Agricultural Society of England was for the purpose of improving the art and science of agriculture in all its branches, and as we cannot well reform defects till we know what they are, I have endeavoured to point them out faithfully and fearlessly, feeling persuaded that the good sense of the members will receive these hints which I have taken the liberty of giving, not as a slight and as a demonstration of disrespect to those who have so kindly endeavoured to aid us in our efforts to improve the resources of our country, but as a stimulus to excite more attention to a subject in which we are all more or less interested; and I trust that what I have stated is given on good authority, and may be depended upon.

#### V.

The time which I have allowed myself to complete this paper will not permit me to do much more than exhibit specimens of some of the grasses which I esteem the best calculated for permanent meadows and pastures. The better half, I consider, belong to the genus *Festuca*, or Fescue; of which I have cultivated, with great care, at least twenty species or varieties. I have brought some of them with me for inspection, from which a tolerable judgment may be formed of their value; bearing in mind, however, that they are all grown at an elevation estimated at upwards of 600 feet above the level of the sea. In addition to these Fescues, may be added cocksfoot, two varieties of cat-tail or Timothy grass (*Phleum pratense*), three varieties of brome grass (*Bromus*), three or four of Burnet (*Sanguisorba*); *Poa triviale*, or rough-stalked meadow grass, especially adapted for moist situations; *Poa nervata* (Siberian meadow-grass), suitable for cold exposed localities; Alsike clover; rib grass (*Plantago lanceolata*). To these may be added *Alopecurus Tauntonensis* (Taunton's fox-tail), *Anthoxanthum odoratum* (sweet-scented vernal grass), *Avena flavescens* (golden oat grass), and a small sprinkling of perennial red clover.

I conceive the above list amply sufficient, and contains a much greater variety than will be readily procured. All creeping-rooted grasses ought unquestionably to be

carefully excluded, especially as we have a sufficient variety without them, of better sorts, as far as their qualities have hitherto been ascertained. The following list is taken from the seedsmen's circulars, and from Professor Way's table of analyzed grasses :—

- Agrostis (creeping bent-grass).
- Arrhenatherum avenaceum (knot grass).
- Bromus mollis (soft brome-grass).
- Festuca duriuscula (hard fescue).
- Holcus lanatus (woolly soft grass).
- Lolium (ryegrass).
- Poa annua (annual meadow-grass).
- Poa pratensis (smooth-stalked meadow-grass).
- Poa fertilis (fertile meadow-grass).

Although there may be species or varieties of ryegrass which may be strictly called perennial, *i. e.*, which will continue permanently in the ground among other grasses without renewal, and without an extra supply of manure, of which specimens are said to be found in the best old pastures, I think it would be difficult and unprofitable to attempt the cultivation of such, especially till we are better acquainted with their habits and qualities. I should therefore recommend their omission altogether in laying down tillage land for permanent sward. I have been able to prolong the existence of what I thought a superior sort of ryegrass, in full vigour, for seven or eight years, by transplanting it annually into fresh soil.

The *Poa annua*, or annual meadow-grass, although a dwarf plant, has large spreading roots, and is so prolific, by spreading its abundant seeds in all directions the same year that it is sown, that it is seldom that a bare space of ground is not quickly occupied by it, to the exclusion and detriment of more productive and better grasses. I have consequently found this, perhaps, the most troublesome of any weed among my selected grasses, on account of the rapidity with which it comes to maturity and spreads its seeds.

Sinclair's account of the other grasses just named is very unfavourable.

## VI.

As many of the sorts of grass seeds which I esteem the best are rarely to be met with in shops, and especially in their pure unmixed state, I have been chiefly indebted to the kindness of my late much lamented friend, W. P. Taunton, Esq., and — Sowerby, Esq., of the Royal Botanical Garden, for choice specimens of plants or seeds, in addition to what I have found growing on my own estate in Yorkshire. My orders were too small to be attended to by the seedsmen. I was for some years unsuccessfully endeavouring to procure a specimen of meadow fescue, and when I obtained some the first result was a crop of ryegrass, &c. I procured, as a favour, a small packet of rough-stalked meadow-grass; but on sowing it, I found the plants so interwoven with the creeping roots of the *Alopecurus agrestes*, or creeping black foxtail, that I have not been able to extirpate it, although I have had the meadow grass taken up and transplanted, in order to free it from this vile weed, to which I was previously a perfect stranger; but for the most part I have found the seeds mixed with ryegrass more than with any other kinds. I have, however, obtained very clean seed of the sweet-scented vernal grass, and of the *Poterium sanguisorba* of Sinclair (Burnet), from the seedsmen, both of which I find a difficulty in cleaning without great waste.

## VII.

In regard to the difficulties we meet with in distinguishing one grass from another, it arises chiefly from

not having any work on agricultural science to which we can refer for information on the subject, such as an Agricultural Encyclopædia, which would explain terms in local use, and comprehend the elements of agricultural botany, with plates of weeds, with the most appropriate name to each printed in old Roman capitals, so that one language might be used throughout the whole country, local names being distinguished by italics; extending to geology and every other department connected with agriculture. But while at one school botany is taught after the sexual system of Linnæus, and at another the natural order of Jussieu, our difficulties of acquiring the information we are in quest of are thereby increased; and it would be extremely difficult at this time to find persons competent to undertake such a work. As an instance in point, I want to know what is cow grass? Refer to different authorities, and you will find it is a name applied to different species of red clover. Having myself been recommended by our late president, W. Miles, Esq., to apply in all cases of difficulty to Mr. Thomas Gibbs, of Piccadilly, I should be glad to know from him what species of cloverseed is sent when cow grass is ordered?

Want of time obliges me to be concise in what I have to say further under this head. In the first place, then, if we abstract from the soil the richest part of it by a crop of corn, we cannot reasonably expect the benefit of what has been already taken away in the succeeding crop of grass. But supposing a crop of ryegrass to succeed the corn crop, what shall we expect will remain in the land to support other grasses which may be expected to appear after the ryegrass has disappeared? Now, if we pay such a price for good grass seeds as they can be properly produced for, will it not be a waste of money to throw them on the ground when there can be little prospect of a crop? I should therefore say, obtain the best grass seeds only, however small the quantity, and sow them immediately after a clean crop of turnips eaten on the ground by sheep. In the autumn of the same year turn in the *young* calves only—they will thrive well upon them, without doing damage to the young grasses either by close cropping or heavy treading, if the ground be not soft; but late in the spring, or early in the summer of the succeeding year, the same calves might be allowed to graze upon the young grasses for the benefit of both.

I have adopted the plan of sowing at the rate of 24lbs. of my selected grass seeds to the acre, on well-prepared ground, and prefer thin sowing, independently of the economy in the expense of seed. My best crop of grass seed, especially of the slender-leaved fescues of the last year, was from seed sown late in May of the previous year; while that sown about the same time in the year preceding ran more into bottom grass last year. I have by me now what I calculate would sow from ten to twenty acres at the rate just stated, more than I shall have occasion for; and as my family is unwilling that I should devote so much time and money for what no one but myself appears to take an interest in, I have determined upon desisting from prosecuting further this, to me, interesting pursuit as hopeless. If, therefore, any gentleman be desirous of taking advantage of my labours, and procuring some of my seed, he must make his application to me forthwith. I much regret that the proportion of coarse grass seeds is not equal to what I could wish, in consequence of the ravages made in them by the caterpillar before alluded to.

JOHN W. CALVERT, M.D.

3, Park-place, Regent's-park, Jan., 1857.



## THE YOUNG FARMER ENTERING INTO BUSINESS.

The young farmer who possesses an intelligent and inquiring mind is ever anxious to gain knowledge, but more particularly that department of knowledge which shall best fit him to conduct that business upon which he is about to enter. The business of a farmer in these days of modern progress differs materially from the old order of agriculture. The extensive—the general introduction of root culture; the uses of artificial manures; the varied rotation and management of corn crops; the drainage and deep cultivation of the soil: the study and adoption of improved practice in these and other matters connected with the management of the various soils of this country, have raised its productive powers far beyond the average of any other country in the world. Nor is this all. The breeding, feeding, and general management of stock throughout the country have advanced its value in a similar proportion, and increased the production of meat in an astonishing degree. How this is all done the young modern farmer has to learn, or his business will not prove a profitable one. He must ascertain the quality and capabilities of the soil he is to cultivate; the best course of cropping to be adopted; the best description or kind of stock suited to his holding; the best course of culture to be adopted; the best horses and the best implements for his purpose; besides the somewhat minor points all necessary to be known—*i. e.*, the best varieties of grain, roots, and grass seeds, &c., to be adopted, and how to promote their best growth; the best artificial manures applicable to his land; the best kinds of food, and best mode of feeding his stock. He must know the difference between “a breeding farm” and a farm adapted for fattening (“a feeding farm”); nor must he neglect attention to the locality in which his farm is situate. This will lead him to provide for the market, or prepare his stock for the fair, and the like many little considerations of universal occurrence.

The quantity of seed requisite for the various grain and root crops to be sown per acre has become a subject of grave consideration, and great economy is now practised in this respect. The constant care and attention, and the quickest mode of fattening the various animals and poultry designed for food, have become a question of prime importance. The growth and preparation of the potato and other root crops for market have latterly been gradually creeping into general practice, and will ultimately become of great consequence, as the expense of importing these bulky crops will deter importers, and prevent such a trade being very profitable.

It is perfectly ridiculous to say the young farmer has not much to learn. I know of no bounds to the profitable appropriation of whatever amount of knowledge a farmer, either young or old, may acquire; besides, we are on the eve of still greater changes in the culture of the soil. The introduction of steam power is but the work of time, and with it will come great innovations upon ordinary farm practice, and subsequently the abandonment of all systems of rotation in cropping as systems, and the modern cultivator will merely consult his own interest as to the crops he shall cultivate, the necessity for a rotation being done away by the effectual working of the soil, and the aid of artificial and other manures in replenishing it. Let us for a moment look at the ignorant and superficial young farmer, big with his own self-importance, swelling with his fancied acquirements, and boasting in his slender knowledge and judgment. He is above being taught, and is gene-

rally assuming to teach others, and mostly with all that pertinacity and positiveness which is said only to belong in perpetuity to the village pedagogue. Such a young man is not made for the times. No! progression is the universal order of the times we live in—social progress—rapid progress. “Activity is the law of nature.” Onward, onward! “Excelsior, excelsior!” is now the almost-universal cry; and, depend upon it, the agriculturist must not lag behind. Much as he has achieved, he is still behind the times. Nearly all his fellows are in advance. The manufacturer has advanced his productions a thousand-fold. The merchant will speedily transact business daily by electric telegraph with New York and Chicago, or with Madras, Bombay, and Calcutta, &c., &c. The gigantic steamers are now built to import their 10,000 or 12,000 qrs. each, and shortly the weekly supply for London is to come in one bottom. Railroads are constructing everywhere, creating every facility for the transmission of Mother Earth's products from the remotest regions to the required market. All the world is alive, and the demand for everything likely to advance the earth's productive powers is exceedingly great. The demand for first-class animals for breeding purposes is unprecedented, not only throughout Europe, but in America, Australia, &c., &c. All this must, ere long, revert to this country in the shape of enhanced supplies, tending unquestionably to the reduction of prices in every kind of agricultural produce—a thing in itself not to be deplored, but which the farmer, the young farmer, must be prepared for, and be able to compete with in the market. Need I, then, urge upon our young farmers any further inducement to become men for the times, and by the industrious acquisition of every kind of scientific, mechanical, and practical knowledge, fit themselves to extract, to extort from the soil all the inherent virtues it contains in the form of food for the sustenance of both man and beast. But to my subject—*The young farmer entering into business.* I was led to write the above on considering what would probably become a part of a young man's business ere he becomes old, according to the order of agricultural progress at the present time, and the necessity I felt that he should be educated to carry on such progress.

I will now attempt to introduce the young farmer into business. The first thing, of course, is to look out for and obtain a suitable farm, which is no easy matter just now. He should endeavour to procure one near to a good market, and, if possible, in a pleasant country. The farm should contain about one-fourth pasture and meadow land, and the remainder arable, of a good loamy friable character, open and easy to work; with suitable farmhouse and conveniently-arranged premises, situate on the farm near to the arable land. The size of the farm should depend much upon the talent, energy, and capital possessed by the candidate; but, as a general rule, a farm of about 200 acres is a suitable occupation for the first essay of a young farmer, and as his experience grows he may then with safety enlarge his business. A farm of 200 acres has many advantages in bringing out the young farmer's powers. He must almost of necessity take a share in all the operations of the farm. The extent is not enough to engage his time solely in the superintendence; and the more he becomes familiarized with the manual operations of the farm, the better is he fitted to direct such operations to his workmen, and to decide at a glance if work is properly and

expeditiously performed. A little constant manual labour never does a young farmer hurt; the sense of having daily done his duty on his farm makes the evening pass more cheerfully; the man is bettered by it; and being at all times ready to take a turn when requisite, his men are encouraged and his business goes well and prosperously, both master and men have confidence in each other, the farm is conducted more upon the principle of mutual aid than of coercion, the men cheerfully work, and the master has the true satisfaction of knowing they are contented. There is also a new feature in modern agriculture, which the young farmer will do well to recognize. Labourers are better educated: most of them are thinking men, capable of intellectual acquirements, which, to the credit of the nation, they are now able to obtain, through the aid of our many agricultural societies, cheap books, tracts, newspapers, &c., and of lectures, which are everywhere brought within their reach. It is this that makes them men. And the young farmer can no more direct them as machines or as working animals, but must treat them as his friends and helpers. And this is a happy state of things, from which our young farmers will ultimately reap great benefits; for as skilled labour and effective machinery are more and more applied to the cultivation of the soil, so will the educated thinking workman become more and more valuable to his employer.

I shall assume at once that a suitable farm at a Lady-day entry is procured, and that of a general character, by which I mean that it is not especially adapted for merely one line of business, *i. e.*, as a dairy farm, or a hill farm; the former being devoted to the production of butter and cheese, the latter to the rearing of stock—chiefly sheep, and both requiring in their management a peculiar knowledge respectively, the one the art to make the most out of a dairy of cows by attention to their feeding, milking, and dairying, the other the breeding and rearing of stock. The farm I assume to have been obtained is applicable to the general purposes of agriculture, and I purpose to cultivate it after the best modern practice. The extent is 200 acres, one-fourth being under grass. The first question for our young farmer to ask is, What amount of capital shall I require? In answer to it I will enumerate the quantity and cost of farm stock and implements necessary, and subsequently add the tenant-right, which will represent the capital required, exclusive of household furniture, &c. I will put it somewhat in detailed form.

STOCK.	£	s.	d.
To 6 Cart horses, at £35 each .. ..	210	0	0
1 Nag horse .. ..	30	0	0
4 Milch cows, at £18 10s. each .. ..	74	0	0
12 Young steers or heifers, at £9 5s. each .. ..	111	0	0
100 Breeding ewes, at 50s. each .. ..	250	0	0
50 Shearlings for fattening, at 52s. 6d. each .. ..	131	5	0
150 Illeggets, at 42s. each .. ..	315	0	0
12 Pigs, at 35s. each .. ..	21	0	0
Geese, poultry, ducks, &c. .. ..	2	0	0

#### IMPLEMENTS.

3 Ploughs for common ploughing, at £3 10s. .. ..	10	10	0
1 Ditto for ridge work, &c. .. ..	4	0	0
3 Sets of harrows, various, at £3 5s. .. ..	9	15	0
1 Scarifier or cultivator .. ..	7	0	0
1 Field-roller .. ..	8	10	0
3 Carts with shelvings, at £12 10s. each .. ..	37	10	0
1 Light ditto .. ..	8	0	0
1 Market waggon .. ..	23	0	0
6 Sets of double harness, for field and team work, at £1 15s. each .. ..	23	10	0
1 Set of gig harness, saddle, and bridles .. ..	12	0	0
1 Gig for family use .. ..	30	0	0
1 Dressing machine .. ..	12	0	0
1 Set of barn requisites, sacks, riddles, &c. .. ..	8	10	0
1 Drill for corn and seeds. .. ..	25	0	0

1 Set of fold-yard requisites, chaff cutter, crbs, troughs, &c. .. ..	£20	0	0
1 Set of field requisites, turnnip cutter, trays, troughs, &c. .. ..	21	0	0
Sundries in yards, and cake breaker, forks, &c. .. ..	35	10	0

Valuation of stock and implements bought in at sales, &c., cheaply. .. .. £1,450 0 0

#### TENANT-RIGHT ACCORDING TO AVERAGE CUSTOMS, BY ESTIMATION.

	£	s.	d.
To 40 Acres of growing wheat at Lady-day entry, at 50s. per acre .. ..	100	0	0
20 Acres of barley sown, at 30s. per acre .. ..	30	0	0
15 Acres of oats or other spring crop, at 28s. per acre .. ..	21	0	0
40 Acres of seeds growing, at 12s. per acre .. ..	24	0	0
35 Acres of fallows' ploughing, at 7s. 6d. per acre .. ..	13	2	6
Manure led on to the land, 300 loads at .. ..	50	0	0
Valuation of cake and artificial manures used .. ..	50	0	0
Ditto of drainage works done .. ..	25	0	0
Ditto of straw and manure in yards .. ..	25	0	0
Ditto of sundries not enumerated .. ..	11	17	6

Estimated value of tenant-right on average principles. .. .. £350 0 0  
Farm stock and implement account .. .. 1,450 0 0

Total amount of capital (in round numbers) required on entry is .. .. £1,800 0 0  
To which must be added cash required for labour, rates, taxes, housekeeping, and other outgoings for eight months .. .. 350 0 0  
And for household furniture, dairy, &c. .. .. 250 0 0

Making a total of capital required to manage 200 acres of .. .. £2,400 0 0

I do not pretend to assert that the above somewhat loose estimate is in every point correct; but on the average of farms throughout the kingdom, differing as they do so materially in almost every district, it will approximate very nearly to a fair valuation. In Lincolnshire, in some districts, the valuation is confined to the mere expenditure of seed and labour; in others, cake, manure, drainage, and acts of husbandry are valued. In Yorkshire and other places, the "away-growing crop" is valued as a crop at harvest-day. In the southern districts of the kingdom, the valuations are still more stringent for the incoming tenant; and the cost of acts of husbandry, dressings, half-dressings, ploughings, copses, &c., &c., is very great. I have endeavoured, without particularizing too much, to steer somewhere between extremes. It is true, a farm of 200 acres may be taken and worked—*fairly worked*—with less capital, but I cannot think with the like benefit to the tenant. I have before me a valuation, made some few years since, upon a farm containing about 800 acres of good land, which does not exceed £3,500; but the tenant was, in consequence, compelled to dispose of the grass and hay, straw, and other keeping, annually. The tenant should rather be "over than under the mark," because, if he is prudent and judicious, he can take advantage of any rise or fall in the market, and is not compelled to make sales to meet coming demands; besides, the anxious care of providing for an uncertain future is thus much abated, and the young farmer pursues his course with cheerfulness, and knows and feels the comfort of independence.

The question of capital once settled, we now come to the all-important business of laying it out to the best advantage. I have enumerated horses, cattle, sheep, and pigs in the valuation; but the great question for every young farmer to solve is this: "Which are the best and most profitable kinds of stock for me to buy?" Before he can answer this satisfactorily, he will find

many matters for his serious consideration. Take first the question as applying to his farm-horses. He will, in deciding what kind of horses he should purchase, take into account the variety of soil he cultivates, and the proximity or distance from the point of delivery of his produce. If he farms light land, and the market is distant, he will incline to buy light, active horses. Does his farm partake much of tenacious clay or clayey loam, he must then decide to have strong horses. This decided, the question again comes, "Which are best for my use in either case?" I, as a practical farmer, recommend the Suffolk Punch, the Yorkshire, and the Norfolk horses for light lands, and the Lincolnshire and Clevelands for heavy lands, with the very many crosses in the breeds; and some of each cross are equally suited to both descriptions of soil, in proportion to their individual strength and form. I do not pretend to point out the precise breed of horses he shall choose; for they are so crossed and mingled in blood, that he would have some difficulty in selection: but he would do well to try for a true breed. In Suffolks he would have no difficulty; but I confess, as to other breeds, I should feel uncertain as to their pedigree. I don't know, however, that this is of great consequence; for, after all, he will be obliged to select from the fairs and markets such animals as appear best adapted for his service. I think it would answer well to have two or three well-bred, good breeding mares. He would then be able to keep up his stock of farm-horses by breeding; and the occasional sale of a good colt is a good point in business.

The next consideration for our young farmer is the selection of his grazing stock—a most important feature in his business, as upon this point mainly depends his success as a grazier, which is the most interesting portion of his business. The business of a *farmer* and *grazier*, taken separately, are, in fact, two distinct businesses; but in general acceptance they are taken as one, which designation I have adopted—the *farmer*. The young farmer, then, proceeds to select his stock either for breeding or fattening, or both combined: I have estimated for a combination of both modes of grazing, as deeming the farm qualified for both. His inquiry, then, is first, What variety of sheep shall I purchase? I answer, I cannot tell unless I view your farm, but as a general rule and speaking generally, I say, adopt that breed which prevails in the immediate locality of your farm. Men of business are, in the main, to be depended upon in these matters. They may not be grazing that precise breed best adapted to the district; but rely upon it their experience has led them on favourably, not wildly and unduly prejudiced in favour of their "own sort." They have been found profitable, or they would have been abandoned long before you took your farm. But I say this only as a general rule. There may be many, very many good reasons for deviating from this course, some of which I will endeavour to show in giving a short comparative view of some of our popular breeds, and point to the districts in which they are to be found in greatest favour.

**THE SOUTHDOWN SHEEP.**—The most prominent qualities possessed by the Southdown breed of sheep is their hardihood, their fine quality of flesh and wool, their great beauty, their tendency to early maturity, their prolific character in breeding and suckling, their peculiar adaptation to open field or down pastures, and folding. They attain great weights, and make the highest price per stone in the market. The subdivisions of this breed may be taken to consist of the pure Down, the Hampshire Down, the Dorset Down, and the Shropshire or west-country Down. The pure Down is smaller, more compact, and of superior quality to the other breeds. The Hampshire and Dorset Downs are very similar. They produce a much larger quantity of both

wool and mutton than the pure Downs: at the same time partaking much of their superiority in quality and their propensity to fatten. The Shropshires are large and compact, denoting a cross with the Leicester breed; but they possess all the best qualities of the other Down breeds, with more wool of nearly equal value. In the present condition of our wool trade, and owing to the great importations of fine wools, the Down wool has not realized a good relative price in the market; and the weight of fleece being light tends to check their great popularity, and has led to the introduction of various crosses of the breed, generally denominated half-breeds. Hence we have Down and Leicester Down, and Cotswold Down and Lincoln, &c., the two latter producing very large-framed sheep, and all producing much good wool of nearly equal value with Down wools. These breeds are excellent graziers, come early to maturity, and produce heavy carcasses of mutton of good quality.

**THE LEICESTER SHEEP.**—This breed of sheep is next in popularity with graziers. They possess many valuable qualities. Their propensity to fatten is unequalled, and they produce a good fleece of valuable long wool, which in these times is nearly equal in price per lb. to the Southdown wool. Their frames are small, but very compact and symmetrical, and their flesh of beautiful quality, if not too fat; and they are so docile and quiet in their habits, that they consume less food than any other variety of sheep of equal size. As breeders they are not equal to the Down varieties; nor do they prove such good sucklers nor so hardy.

**THE COTSWOLD AND NEW OXFORDSHIRES.**—These are so similar, I shall take them as the same breed. It is by far the largest and heaviest breed of sheep in the kingdom; and notwithstanding they possess very compact well-formed frames, they produce a good fleece of long wool, now making a high price in the market. The weight of carcase is occasionally enormous, a ewe having been known to reach 68lbs. per quarter, rams from 80 to 90lbs., and wethers from 60 to 74lbs. The usual weight of a twenty-one months wether sheep, well fed, will commonly reach from 30 to 36lb. per quarter. They are quick feeders, but their flesh is loose and flabby, with more lean meat than the Leicesters.

**THE LINCOLNSHIRE LONG-WOOLS.**—This breed is very large, and produces more wool for fleece than any other breed; and which at the present time is of greater relative value in the market. Their fleeces frequently average, in a feeding flock, 10lbs. each; which at this time is making 46s. per tod, or 20d. per lb., or 16s. 8d. per fleece. They produce a large well-fed carcase of good mutton, equal to the Leicester, and superior to the Cotswold in quality. Their frames are large and well formed, and occasionally attain to great weights. A ewe exhibited at the Smithfield Club Show a few years since weighed 65½lbs. per quarter; and a three-shear wether sheep has been known to reach 84lbs. per quarter. The usual average weight of a twenty-one months well-fed wether would be about 28 to 32lbs. per quarter. They are hardy, and will fatten upon moderate pasturage; are good breeders, and of docile habit.

There are many sub-varieties in all these breeds. The large Leicester and smaller Lincoln approach so near each other in their general characteristics, that it is a difficult matter to note the distinctive features. The Cotswolds are much more distinct in character; their form and carriage are different.

The Southdown breeds are mostly to be found in hilly and open-country districts where folding or fallow lands generally prevail, which is chiefly in the south of England; the Leicesters, in the richer valleys and sweet pastures of the midland counties, Yorkshire, and the north; the Cotswolds, the high lands or hills of

Gloucester and Oxfordshire, and the marshes of Somersetshire. The Lincoln long-wools inhabit Lincolnshire, the fens, and some adjoining districts. The half-breeds are intermingled in nearly every district named; and the first-cross is highly prized.

I have thus very shortly introduced to a young farmer these popular breeds of sheep with the view of guiding his choice. I have abstained from mentioning any particular breed which I may incline to favour; and my only recommendation is to choose that class of sheep that combine the most advantages in producing wool and mutton of the greatest value. To decide this point aright, he must take into account what I have named above—the weight and value of each fleece of wool and carcase of mutton, and the quality of pasturage on

which they are to be grazed, bearing in mind, as a general rule, that sheep of large size require good pasturage; sheep of light weight will be best adapted for inferior pasturage. I am well aware that this principle is not carried out on the Cotswold Hills: there the pastures are, generally speaking, poor, cold, and bleak; but the sheep are the largest in the kingdom. The artificial grasses are good; but still the sheep are thinly placed: no heavy stocking is common. One other point I name as of moment in making this choice: it is very desirable to select a breed that will arrive at a great weight in a short time, either by its naturally quick growth or its propensity to fatten. A little animal may fatten quickly; but he is still small. The British population are looking for a larger supply of meat, which must be met.

## FACTS CONCERNING THE WORKPEOPLE OF EUROPE.

In our last we sketched the origin and course of the system of compulsory engagements, as exemplified by Russia, &c. We also spoke of its tendency to repress all sorts of ambition in the lower orders. A certain amount of physical enjoyment is insured to the serfs, but they are constrained to remain in their orbit. Under a free-labour system progress is the order of the day: every path is open. The strongest minds find no difficulty in mounting from the lowest positions to the highest pinnacles of society, but the weakest go to the wall. Nations in a swift state of progress, and particularly those imbued with the principles of liberty by the Goths—those valiant fellows who left their countries to destroy tyrants and slaves, and to teach men that nature having made them equal, reason could not render them dependent, except where it was necessary to their happiness—nations, we say, in a swift state of progress, such as England and France, soon broke the chains forged in the South. In Turkey and Russia, where population is small and the tract of uncultivated land large, serfdom must long continue. There seems to reign in Asia (Russians being of Asiatic origin) a servile spirit, which they have never been able to shake off. It is impossible, in the histories of the people of Asia Proper, to find one passage that discovers a free soul: we discover nothing better than the heroism of slavery.

Up to our time, the transformation of the compulsory into the remaining systems—that is, the *voluntary permanent engagements* of Scandinavia and Germany, and the *momentary engagements*, or those identical with complete individual liberty—has taken place either at the mere caprice of the ruling authority (as in Russia), or many incidental causes have conspired to effect it in an irregular manner. Those of our readers who have studied history will at once remark that this transformation was more due (throughout Europe) to the Crusades than to any other cause. This is most correct. The feudal system, before the Crusades, had begun to show signs of decline; and when they were first organised, the ties of fidelity produced by feudal relationships were very strong. The Crusades sensibly mitigated the ferocity of the spirit of feudalism, and served to eradicate some of those gross abuses it had engendered. Any generous sentiments inspired by the system they preserved, for they developed, in every people that increased their force, whatever was favourable to the progress of civilization. Indeed, we may further consider them as a safety-valve to the over-boiling spirit of the lower orders, which, if longer compressed, would have blown to pieces the whole fabric of society: and they generated that desire for personal distinction throughout all classes

of the people which always belongs to a rising civilization. Men began to know what manhood meant, and that there was another sort of virtue than the virtue of blind submission. And further, as regards England, an *intelligent* law favoured escape from serfdom; and the manufacturers, then rapidly rising, served but to encourage and stimulate an act smiled at by the law.

A transformation effected so irregularly was attended by irregular results; but this irregularity, complained of by some writers, was better than a *sudden* manumission of slaves. A general law to the effect would have inevitably produced great distress.

The inhabitants of towns, as the policy of princes concurred with the advancement of their consequence, were freed from the bonds of serfdom sooner than were the peasantry. That large mass of serfs that had been artisans speedily organized themselves, when they became free, into associations of masters, companions, apprentices; associations which limited the number in each calling to an amount calculated to prevent the exercise of undue competition; which bound the apprentices to the companions, the companions to their masters, until they had produced signs of their efficiency to ascend to the superior grades; which, by proportioning the supply to the demand, always secured employment for the able-bodied of the corporation; and which, by a well-regulated system of imposts, insured to the disabled certain and honourable means of subsistence. The cities of Lombardy threw off the feudal yoke before the era of the Crusades, whilst those of England and Germany obtained franchises at that period. The liberty of towns commenced with corporations, because experience had taught their inhabitants that otherwise the conservation of their rights and privileges would have been impossible. The serfs of the plains derived but little immediate advantage from the Crusades, for they could not unite: they were dispersed and feeble; but the propitious impulse had been given, and the day of deliverance came. To a large class, however, of the lower rank of villains, trained to no specific pursuit, the gift of liberty was fatal. They found themselves hurried at a stroke from the extreme security of servitude to the uncertain fluctuations of the momentary system. They fell upon hard times, and mourned for the flesh-pots and yoke of Egypt; for, not being trained for free labour competition, they were reduced frequently to the condition of paupers, and lamented that baronial was only exchanged for parochial servitude. The higher order of these serfs of the plains, attached to agriculture and mining operations, remained where they were, exchanging their absolute servitude for a voluntary but perpetual contract.

We find instances of this species of contract principally northward.

The *régime* of voluntary perpetuity possesses many advantages over the momentary contract, and may afford many valuable suggestions for securing the well-being of the masses in the perilous paths of those engagements.

We may firstly remark that the peasants are free under condition of discharging their monetary liabilities, and by the benevolent patronage of their masters they are secured against all the evils incident to a state of liberty among an illiterate and improvident population. The large masses of workmen grouped around the mines and iron factories of Sweden, Norway, and Germany, are nominal proprietors of house and land, which they hold from the several companies to which they belong, subject to the condition of paying 4 per cent. interest on capital invested in the purchase by the company until the debt is cancelled by the payment of weekly instalments. So long as the interest is regularly paid, the companies care not about receiving the principal, which is frequently left as the evidence of a good relation. The tendency of this plan is to induce the labourers to practise economy. In some cases they arise to the dignity of positive proprietors of house and land, and in other cases, where the debt remains, good conduct secures it to them from generation to generation. And further, provisions are furnished at a wholesale price. The company buys large stores when provisions are cheap, and sells out to their men at cost price—plus the interest due on capital so employed. The work-people derive help also from having the right to fish and shoot, and to cut wood, and of common pasture. What would not our English labourers give for such liberties? Beyond this, schools for the young are organized; and that every man, woman, and child should be instructed is considered as essential as that they should be fed: physical and mental vigour are best developed cotermporaneously.

The abuses to which the law of supply and demand is liable under the free labour system, are carefully provided for. This is effected by keeping the number of habitations on their domains equal to the number of families required for the working of their establishments. These corporations oblige the superabundant population to emigrate, instead of availing themselves of the glut in the labour-market to lower wages and degrade the social condition of the community. Hence in this as in the compulsory engagements, to which it bears a close affinity, man is not remunerated according to the amount of labour done, but according to his wants and the necessities of his existence.

We do not desire to hold up the sixteenth century as a model for the nineteenth century, but it is refreshing to look back upon a time when the nation was in a normal condition of militancy against social injustice. Population has increased; employment has become complicated and fluctuating since then. We know that circumstances are changed. But difficulties and drawbacks existed at those times as well as they do now. Of liberty, in the modern sense of the word—of the supposed right of every man to do what he will with his own or with himself—there was no idea, at the period we refer to. To the question, if ever it was then asked, "May I not do what I please with my own?" was the brief answer, "No man may do what is wrong, either with what is his own, or with what is another's." Producers, too, who were not permitted to drive down their workmen's wages by competition, could not sell their goods as cheaply as they might have done, and the consumer paid for the law in an advance of price. The burden, though it fell heavily on the rich, lightly touched the poor, and the rich consented cheerfully to a tax which secured the loyalty of the people. A modern

writer very truly says—"The working-man of modern times has bought the extension of his liberty at the price of his material comfort. The higher classes have gained in wealth what they have lost in power."

While advocating a *strict conservation of the spirit of so good a principle*, we are free to confess that the solution of our present difficulties must be made to agree with our present circumstances.

And the letters that appeared some years ago in the *Mark Lane Express* on the subject of "Wages," were written with this practical idea; and in treating of the *Equitable Wage principle*, it is our opinion that we developed a remedy that did accord with the existing *régime*.

We then adduced illustrations of its mode of practical operation in England; but we now point to the multitudes who are deriving benefit from it in Sweden, Norway, and Germany.

"The men are not remunerated according to the amount of labour done, but according to their wants and the necessities of their existence." This sentence, which appeared in our last letter, we introduce at the commencement of the present one, for the purpose of making a few reflections upon it.

We granted the feudal system some redeeming points, and we asserted that when it was abolished, what of good it contained was preserved. One of the generous sentiments retained was that which we have quoted above, and it is not a little astonishing that we should owe so just and magnanimous a principle to Slavery. It was the *necessity of serfdom* we must own. But we in England are such decided abolitionists that we denounce the good with the evil unreservedly. We abjure the principle in question as a most glaring absurdity, fit only for moon-struck philanthropists and maudlin theorists on political economy. This form of patronage, however, strange as it may appear in this part of the world, extends over the greater part of Europe (either in a voluntary or compulsory shape), and wherever it prevails is accompanied with a solidarity of classes, and a feeling of unity between the ranks of society, that oddly contrasts with the disunion and revulsion existing under the more democratic institutions of the West.

The action of the law of demand and supply, where there is a lack of morality, and the want of a sense of responsibility on the part of masters, is very fatal to the welfare of any work-people, or the stability of that nation of which they are the basement. Given morality and a feeling of responsibility on the part of capitalists, and the action of the law of demand and supply, so open to tyrannical abuse, will be identical to that of the voluntary perpetual contract. That contract means that a man shall live, and enjoy the blessings of life, while he is increasing the wealth of those who have large means placed by Providence at their disposal. The system we see exemplified to our sorrow and perplexity in England, means that the poor man is a machine—made, worked, oiled, and used up for the exclusive advantage of the capitalist. There are exceptional cases, of course; because in England there are happily exceptional instances of noble-spirited masters; but the great bulk of our artisans and rural workmen are in a state far inferior to those employed under such corporations as we have referred to. A cry of distress goes up from amongst us, almost as bitter and loud as that which rises from the cabins of the slave-born—there is heavy toil and light recompence. O! that we could so analyze the statistics of crime and pauperism as to ascertain the exact number of men and women who owe their ruin to this law of demand and supply, administered by an unprincipled executive! Could we but be enamoured of the sublime, the patriotic philosophy of Prevention, a glorious future

would speedily arrive to England. Could the capitalist of England be brought to declare, and to act on the conviction, that a provision for the intellectual and moral welfare of those by whose labours they profit shall be considered an essential part of their system of business, the "good time," so very long in the future tense, would actually stand erect and radiant in the very midst of the Present. But we, in this age of commercial enterprise, are in danger of being led away by those political economists who look merely at material agencies, and never consider moral causes and influences. Much worship is made to Economy, as though it was the Spirit addressed by Sandy Macay's anatomical figure:

"Here I stand, a working-man—  
Get more skin off me if you can."

Economy! Thus to prostrate the term economy, indeed. Liberality, justice, active sympathy, friendship—these are all qualities of economy.

Close-fistedness is not economy; a system of over-work and under-pay is not economy. Economy owns not such forces as oppression and intimidation, and servile dependence; nor does true economy seek her food in the vitals of the working-people. True economy does not provide that men be reared from the very dawn of life amidst scenes of filth, violence, and crime—blunting every moral sense, and debasing every thought and feeling. True economy is not a curse—it is a blessing, and conserves to us all the gifts of God, which men in their folly and wickedness would barter away as did Esau his birthright.

It will be seen that while those workmen, under the

form of engagement we are now contemplating, have a greater or less sacrifice of personal liberty to endure, they are yet not exposed to that personal indignity of parochial relief. To them the enjoyment of comfort is insured to an extreme old age. We are quite aware that this form of patronage is variable, obliging, as we said before, a greater or less degree of sacrifice of personal liberty; but the aggregate amount of beneficent institutions under such system is always such as to protect the labourer against evils that may arise from his incapacity and improvidence.

In the mines of Derbyshire and the iron foundries of Nivernais, whose proprietors have abandoned the momentary system for that of voluntary perpetuity, the workmen, though mere tenants-at-will, are considered to have a sort of lien upon the company for employment and support, so long as their conduct is what it should be. The proprietors do endorse as a good principle of business the necessity for providing for the moral and mental wants of their work-people, and "they defend it as a legitimate and wise application of funds entrusted to them for trading purposes." Schools are established. A self-supporting system of relief is maintained. In a word, the power which their superior knowledge and capital place at their disposal is used to meliorate the condition of the community.

And we can draw a conclusion from these facts that will form a very good conclusion to this letter—namely, that the giving and the taking of wages is not the only connexion that should exist between the employers and the employed.

We have more facts, however, to lay before our readers. F. R. S.

## IRRIGATION IN ITALY.

### No. I.—DESCRIPTIVE.

While reading of the classic lands of Italy we are apt to think that the smiling gladness of her fertile fields arises mainly from her benign climate and her cloudless skies, forgetful that while Nature has thrown with lavish hands her bounties from her, man with his laborious arts has not been idle. Although with a productive climate almost equalling that of India, where man, under the shade of the plantain or the palm tree, has but to stretch forth his hands to partake of the spontaneous gifts of earth—still the very peculiarities of the seasons have necessitated the establishment of a system of cultivation which, began ages ago, has with incessant toil and care been maintained and extended in modern times with amazing results. We refer to the system of irrigated meadows, which entering into the rotation with other crops, results not only in maintaining a complete supply of green food for the use of stock, but as a matter of course adding to the supply of manure and the increased cultivation of the cereal crops. In view of the certainty with which the grain crops are maintained by the system, the facilities which it offers for the fertilization of barren lands, and the increased attention moreover now directed to the establishment of a somewhat similar system in this country, it may be at once interesting and instructive to glance as concisely as possible at its peculiarities as witnessed in Northern Italy.

By far the most complete and exhaustive account yet published of Italian irrigation, is that of Captain Baird Smith ("Italian Irrigation," 2 vols., with Atlas of Plates: Blackwood & Sons, Edinburgh and London,

price 30s.). This gentleman was instructed by the Board of Directors of the East India Company to visit the classic land of irrigation, with a view to obtain information which might be useful in carrying out similar plans in India. To study the system (to quote the author's own words) "in its various relations—to examine the details of its works, so famous in the history of hydraulic engineering—to investigate the principles and note the practical application of those legislative enactments which by universal consent are held to be the most perfect at present in existence—to become familiar with the actual operation of that machinery for the distribution of water to cultivation, which is considered by most observers to come nearest to the type of theoretical perfection, the history of which will be found hereafter to have an almost romantic interest—and finally observe carefully those sanitary arrangements which the experience of ages may have suggested, for preserving the public health with the least possible sacrifice of individual interests—were the chief objects prescribed to me in the instructions with which I was favoured." From this succinct account of the task allotted to the author, some idea may be obtained of the valuable contents of the work in which the results of his mission are embodied. Although with characteristic modesty the author scarcely hopes that he has succeeded in completely filling the outline thus sketched with the fullest details; still, after a close examination of the work, we have no hesitation in recommending it as a most satisfactory account of this system, so full of interest to all practical agriculturists. To those who contemplate the establishment of a plan of irrigation, we consider the possession of the book a *sine qua non*; for not only are the details of practice lucidly ex-

plained in the body of the work, but plates of "working drawings" accompany the letter-press, these abounding in hints and suggestions of a thoroughly practical nature. We have ventured thus particularly to notice this work simply from what we conceive the importance of the "system" which it so well describes—a "system" which possesses at once a high value as an agricultural and sanitary agent. It is to its pages we are principally indebted for the substance of our present papers.

The valley of the Po, in which the most extensive and highly cultivated "plains of Italy" are met with, is divided *politically* between Sardinia and the Lombardo-Venetian kingdom, although *naturally* it is essentially one. Captain Smith, however, takes advantage of this division, and adopts it to describe the details of Italian irrigation under two great classes—Irrigation (1) in Piedmont; (2) in Lombardy.

The hydrography of Northern Italy is influenced by two mountain ranges—"one from the main chain of the Alps, and the other from the minor chain of the Maritime Alps and Northern Apennines." The great "receiving stream" is the Po, which flows at right angles to its system of feeders. This peculiarity renders the Po a simply passive agent in the irrigating system; it acts as an escape for its waters, but "as yet it does nothing more." It plays no part as a source of supply to irrigating canals; for these canals, intersecting the tributaries at right angles, would necessitate arrangements entailing great expense in construction and maintenance.

A fine exemplification of the adaptation of natural causes to the necessities of a country is met with, in the plains, on the left bank of the Po, of Lombardy and Piedmont. The source of the supply of the tributaries on the left bank is in the main chain of the Alps, where the region of eternal snow is met with. These tributaries are at their highest flow during the height of summer, when the supply for irrigating purposes is most needed; and as the temperature decreases, their bulk decreases in like proportion. In the States of Parma and Modena, on the right bank of the Po, the irrigating supply is least at the season when most required; for as the mountain ranges from which the tributaries draw their supply are of less elevation in the minor chain of the Northern Apennines, the volumes of water decrease just at that very time, the season of heat and dryness, when water is most required. "Hence," says Captain Smith, "when summer rains do not fall, to mitigate the severity of the season, it is evident that the system of irrigation from rivers unconnected with snow-covered mountains must necessarily be a very imperfect one."

From this we see that, irrespective of other considerations of necessity or fitness, the adoption of the Italian system in this country must be of limited extent; but it is just at this point where the question of "town sewage" supplies, obtrudes itself with great force, demanding to be heard, as offering a solution of the difficulty in a way more or less complete. It is thus that the extension of irrigation in this country comes to possess a double interest, sanitary as well as agricultural; and the result of all experience, so far as we have gone, seems to point to the employment of our town sewage in the liquid form, as the only mode by which its constituents can be made available at a cheap rate. But the question here opened up is so important, and demands so close a discussion, that we must leave its consideration for a future paper, and return now to the immediate object of our present one.

The irrigating district of Piedmont—which we shall first glance at—embraces the provinces of Ivrea, Vercelli, Novara, Mortara, and Vigevano, situated between the tributary rivers the Pico and the Ticino, and occupies an area of 2,500 miles, or 1,750,000 acres. The

principal streams are the rivers named above, and those between them, as the Dora, Baltia, the Sesia, the Azogna, and the Terdeppio. From the inclination of the district through which they flow, from the base of the great range of the Alps to the banks of the Po, the fall is very rapid; the beds, however, being well calculated to resist erosion. These rivers have again their tributaries, as the Dora, the Chisella, and the Sesia, the Elvo, and the Cerio; "so that the tracts of the country between them are literally covered in every direction by artificial channels of various dimensions. The region of the Alps, whence they all flow, includes the loftiest peaks of the chain, and, amongst others, Mont Blanc, Monte Rosa, Cervino, &c., all crowned with perpetual snow; and hence insuing, during summer, an abundant supply to the rivers." But although the supply is abundant and permanent, it is very fluctuating, the whole of the rivers, with the exception of the Ticino, flowing directly from the mountains—interrupted by no great lakes, as in Lombardy, by which the waters can be replenished, and in which they can be purified from the debris brought down from the higher districts, and which, spread over the land, is found to exert an injurious influence, and deposited in the canals a constant source of embarrassment and expense. "Notwithstanding these drawbacks, the hydrography of Piedmont is admirably adapted for purposes of irrigation—a fact best proved by a glance at the map, which will show the extent to which it has ministered to these ends."

From tables given by Captain Smith, it appears that, on the left bank of the Po, the area of the basins of the irrigating rivers in Piedmont is 7,656 square miles, discharging 27,230 cubic feet per second, of which only 8,290.54 cubic feet per second are utilized for irrigatory purposes; this quantity of water irrigating a surface of 306,613 acres in the plain, and 180,000 acres in the valleys of Upper Piedmont—in all, 486,613 acres. The length of the canals and branches in which this water flows is estimated at 1,200 miles. This, however, does "not include the numerous small distributing lines which are to be met with on every farm, nor the channels of the upper valleys. These latter," says Captain Smith, "I cannot even attempt to guess at, so numerous are they, and so scattered. Most liberal arrangements for cross-communication are made in every part of the country; and it is surprising to the visitor to see the profusion with which works of all kinds have been constructed." The statistics given in the work, with reference to the extent of the land under irrigation, show that one-third of the "cultivated and cultivable area" is under its influence. In the best farms, where, as irrigated crops, rice, water-meadows, and Indian corn are cultivated, a good proportion is understood to be—three-fourths under irrigation, and one-fourth dry.

March is considered to be the commencement, and September the conclusion, of the irrigating season. The four months, May to August (inclusive), are those in which the demand for the water is greatest. The thermometer, exposed to the sun during those months, shows a mean temperature of 91.97 deg.—a fact of considerable interest as connected with irrigation, which is essentially necessary to temper a heat so excessive. The average annual fall of rain, as deduced from ten years' observation, is very nearly 37 inches, of which the large proportion of 28½ inches falls during the seven irrigating months. This quantity is divided with considerable regularity over 71 rainy days, giving a daily fall of about 4-10ths of an inch. The perfectly clear or partially cloudy days, taken together, are just double the number of those on which rain falls; and though this proportion is not quite so favourable as in Lombardy, still it is well adapted for a country pro-

vided with means of irrigation, as there is sunshine and heat sufficient to mature the products, such as rice, Indian corn, &c., which demand these, as well as the employment of water, to ensure their perfection.

The soil of the irrigated districts changes from "light sand to dense clay, and in many places showing much gravel mixed with the earthy constituents of the land." The heavy soils are devoted to the rice, the lighter to the cereals and the green crops. The general characteristic of the soil is light, but which, under water, is in a high degree fertile.

We have already alluded to the fertilizing properties of an irrigatory system: in no place is there such a decided proof of this met with as in the modern districts of Mortaro and Vigevano—the ancient Lumellina. Previous to the introduction of the irrigating canals, the state of the cultivation of the land and the condition of the population were "deplorable in the extreme. Nothing could be more striking than the contrast between the Lumellina unirrigated and the same district irrigated. Now, it rivals the Milanese in its rich productiveness: it is one of the most densely populated regions in Europe: its soils have received just the element they wanted, to call forth their internal powers; and instead of arid wastes or extensive marshes, corn-fields, green meadows, or rice-grounds cover the face of the country."

Such we offer as a brief sketch of the irrigated districts of Piedmont. We now turn to those of Lombardy, the second great district of Italian irrigation.

The principal feature of the irrigated districts of Lombardy is the "lakes." The largest of these is the Lago di Garda or Benaco. Its supply is obtained principally from the Parca, which "has its origin among the snows of Monte Adamo, and by the streams of Ponali and Toscolano, which drain the minor valleys of Ledro and Vista. It is situated at a height of 226 feet above the level of the sea. Its length is  $32\frac{1}{2}$  miles, and its maximum and mean breadths are respectively  $10\frac{1}{4}$  and  $4\frac{1}{2}$  miles. Its perimeter is 87 miles; and its superficial area is estimated at 73,856 acres. "Its maximum depth is 1,915.59." The other lakes may be briefly noticed: 1, Lago d'Iseo,  $15\frac{1}{2}$  miles in length,  $3\frac{1}{2}$  in maximum and  $1\frac{1}{2}$  in mean breadth, with a surface of 14,720 acres, and a maximum depth of 984 feet. 2, Lake of Como or Lario. This beautiful and well-known lake, so beautifully described by Sir E. Lytton Bulwer, is in length 50, in maximum breadth  $2\frac{3}{4}$ , and in mean ditto 1 mile, with a superficial area of 34,944 acres, and a maximum depth of 1,928.7 feet. 3, Ceresio, or Lugano, which is 28 miles in length, 2 miles in maximum and three-quarters of a mile in mean breadth, having a superficial area of 12,800 acres, and a maximum depth of 520 feet. 4, Verbano, or Maggiore. This is the deepest of all the lakes, having a maximum depth of 2,624.64 feet. Its area is estimated at 47,280 acres; the length is 40 miles, its maximum breadth  $5\frac{1}{2}$  and its mean breadth nearly 2 miles. The lake Lugano pours its surplus waters into it, and the minor lakes of the Varise are linked with it, by small streams. The rivers flowing directly into this great lake are the Toccia, the Maggia, and the Ticino—which each in rising from the lake retains its name, "and becomes the discharging channel for the whole of the mountain drainage between Monte Rosa and the Splugen." Those three rivers—the Toccia, the Maggia, and Ticino, and this lake Maggiore—are the "main arteries" and the "great basin," as it were, of a system of mountain drainage "extending over an area of about 90 miles in length, with a mean breadth of from 25 to 30, or nearly 2,500 square miles. Within this area are included some of the loftiest peaks in the Alpine chain, and among them the familiar names of Monte Rosa, Cervino, St. Gothard, the Great St. Bernard, and the Splugen."

The rivers of the great irrigating system of Lombardy must now be noticed. The most important of these is the Ticino, above alluded to, and which forms the frontier boundary between "Lombardy and Piedmont." The total area of its basin is estimated at 2,705 square miles, and its discharge per second 11,667.55 cubic feet. The natural fall is so great, that ordinary water-communication could not be easily carried on; but the difficulties thus presented have been overcome by the establishment of a series of navigable canals.

The second great river is the Adda—the escape-line of the Vorno. The total area of its basin is 2,264 square miles, and its discharge is estimated at nearly 7,000 cubic feet per second.

The third great river—the escape-line of the lake Iseo—is the Oglio. The total area of the basin and the branches of which is estimated at 2,553 square miles, and its discharge at 4,859.40 cubic feet per second.

The last of the great rivers of the irrigating system of Lombardy is the Mincio—the escape-line of the lake Garda. The total area drained by the Mincio is estimated at 1,099 square miles, and its discharge at 2,658.95 cubic feet per second.

These rivers have tributaries of more or less importance, of which, however, space will not allow us to give a notice.

A feature of Lombardian irrigation which we must not omit to notice, is the "springs" or *fontanili* which are met with so abundantly over the whole surface of the plain, yield a rich supply of water, in which the *marcite*, or water-meadow system of the Milanese district, exclusively depends for its operation. Independently of these, we find the supply of water to the irrigating system of Lombardy by the rivers, major and minor, amounts to a volume of water equal to 30,737.45 cubic feet per second; the area drained by them is equal to 9,427 square miles.

The soil of Lombardy possesses similar characteristics to that of Piedmont. In the province of Mantua, it is heavy and compact, requiring drainage; while in the Veronese it is strong and light. The variations of climate alluded to have reference only to temperature and its hygrometrical condition—climate being regarded solely in its relation to irrigation, and not as a general question at all. From the observations recorded, Captain Smith deduces the following: That during the four irrigating months the mean temperature ranges from about 70 deg. to 75 deg. Fahr., while its maximum is 85 deg. to 90 deg., rising frequently, however, to 94 deg. at Milan and 98.2 deg. at Mantua. An extraordinary degree of dryness is shown by the hygrometer during the irrigating months—"the instrument for days together standing a few degrees only above zero," while in winter "it indicates an almost constant state of extreme humidity, approaching closely to total saturation." This point is worthy of special notice here; for, as in India, so in this country, the proposition to extend irrigation has been met with the apparently forcible objection that by it a damp, and therefore highly prejudicial state of the atmosphere, would be brought about.

As regards the rain-fall of the Lombardian districts, it appears that the yearly average may be "entered at nearly 36 inches, of which the large proportions of nearly 22 inches fall during the season of irrigation, being divided over a mean number of 24 rainy days, thus giving a daily fall of 0.91 inch. In giving the proportion of clear to cloudy and rainy days in Piedmont, the reader may have fancied that the term, "sunny Italy," was scarcely applicable. In Lombardy, however, the case is different; for "a little less than half the year the sky at Milan is unclouded, and the vegetation receives the unchecked influence of the sun's light and heat. At Lodi the same happy conditions exist for



more than half, and at Brescia for two-thirds of the entire year." What a contrast to this cloud-shaded country of ours!

The total area of Lombardy may be estimated at—including the Venetian province of Verona, possessed of a considerable extent of irrigation—9,350 square miles, or say 6,000,000 acres. Of this, a very small proportion is waste or unproductive land; but of 8,262 square miles in Lombardy, 561 only are reported by the Austrian Government as sterile. The entire length of irrigating canals in Lombardy is estimated by Captain Smith at 4,500 miles. Although throughout the whole of the Lombardian provinces the system of irrigation adopted, is more or less complete, "the grand development" to which the fame of the system is due, takes place within the provinces of Milan, Lodi, and Pavia.

## No. II.—PRACTICAL.

Having in our two former articles briefly glanced at the leading characteristics of Piedmontese and Lombardian irrigation, we now propose to turn our attention to the methods employed in applying the water for the purposes of agriculture—a point which will elicit information possessing great interest to our practical readers.

The "vast plains of meadow land" is the characteristic feature of the agriculture of the fertile valley of the Po. These meadows are divided into two great classes—the "permanent" and the "temporary." The chief feature of the latter being that they enter into the system of rotation with other crops. The ordinary period of the rotation is for five years, as follows:—First year, wheat, cut about the middle of July, grass seeds being sown with the wheat; 2nd, 3rd, and 4th, meadow under irrigation and abundantly manured; 5th, Indian corn or flax. After flax, and at the end of June, millet is immediately sown, and comes to maturity about the end of October of the same year. A sixth year is occasionally added to the period, when another crop of Indian corn is taken, and the rotation again commences in the same order.

The "permanent" meadows, then, are divided into two classes—the "summer" and the "winter." The latter, known as *marcite*, we shall notice hereafter. The permanent summer meadow is under irrigation from the end of March to the middle of September. The following is a detail of the produce of a permanent summer meadow. There are three cuttings during the season, the hay cut at each having a peculiar name to distinguish it. When the irrigation is commenced very early in spring, four cuttings are sometimes obtained. The grass after the last cutting—the third or the fourth, as the case may be—supplies pasturage to the cattle at the end of the autumn: this is termed the *quartevola*; and is worth about 8s. per acre. The hay from the first cutting may be averaged at 24.375 per acre; the second cutting yields 18.5; and the third 13.9—the total weight per acre being 56.775 cwt. Averaging this at 2s. 6d. per cwt., the gross value of the produce of the acre of permanent summer meadow may be put down at £7 8s. per annum—the net rent being £1 17s. 9d. per acre; so that the "rent is just one-fourth of the total amount" of these returns.

In preparing land either for "temporary" or "permanent summer meadows," three provisions are necessary to be attended to:—1st. To enable the water to be spread readily over *all parts* of the land from the main distributing channel: all natural inequalities of the land which admit of the "water being delivered from culminating lines" are taken advantage of. In cases where this facility is not obtainable, the soil is artificially raised or lowered. 2ndly. To enable the water to be

spread over the surface in a thin sheet, it is made to slope in planes gradually, the amount of slope being, when practicable, two-tenths per 100, or in English measure, 3 inches in each 100 feet. The surface of those inclined planes varies very much: in light land the breadth is sometimes as low as 25 to 30 feet; in heavy lands this is increased eight or ten times. In the province of Lodi, Orlandini mentions that the length of some planes is 590, and the breadth in the direction of the inclination 460, giving thus an area of nearly 6 acres to each plane. 3rdly. Drainage is the third essential provision, by which stagnation is prevented. To effect this, a channel is carried along the base of the inclined planes, discharging its surplus waters in the main irrigatory channel by a natural line of discharge. These, however, more frequently are led to irrigate another plane at a lower level. The direction, wherever practicable, of the drains and irrigating channels is from east to west—the slope of the "planes" in the opposite direction.

Much importance is attached to the surplus water of the drainage channels: passing over land highly manured, it becomes greatly thickened, and being also of a higher temperature than when, it is supplied from the main canals, it is prized "as a powerful stimulant in the production of grass." The quantity of water supplied for irrigating purposes is a matter of great importance, and is estimated in different ways. These our space will not allow us to give here; suffice it to say, that according to De Regi, "a continued discharge of 1 cubic foot per second is sufficient for the irrigation, in twenty-four hours, of four acres." This gives a stratum of water 6 inches deep over the whole surface. With a solution of fourteen days, the above discharge would suffice for the irrigation of "48 acres of meadow land, there being precisely twelve periods of fourteen days each in the season of summer irrigation." The estimate, however, is much on the assumption that the water is absorbed by the land, which in practice does not happen—the Lombardian engineers calculating the "absorption in each watering as varying from one-half to one-third of the total quantity of water employed." In this case, the continued discharge of 1 cubic foot per second may be considered equal to the irrigation of 96 acres. Averaging the various estimates made, our author thinks that "the differences due to variety of soil and other circumstances would be sufficiently provided for by a stratum of water four inches deep—of which half would be absorbed, and half left for further use."

We now proceed to notice the second great division of the permanent meadows—namely, the *marcite* or permanent winter meadows, the object of which is to procure a constant supply of grass during the winter. To ensure this a continuous supply of water is essential, intermittent supply being inadmissible for this "remarkable species of culture." The supply is obtained either from the ordinary irrigating canals, the drainage or surplus waters of the common meadows, or the water of the *fontanili*, previously alluded to. These two last sources of supply are the most prized, inasmuch as it is essential that the temperature of the water used should be as high as possible. The "springs being always warm in the winter there, waters freely exposed to the influence of the atmosphere are preferred to any other means of irrigation during this season." A proof of the advantages of this water is met with in the fact that the "finest meadows are those nearest to the fountain head." The drainage water, when passing from land richly manured, is also supposed by the Lombardian agriculturists to be raised in temperature, and hence, as above stated, used for *marcite* cultivation. The cold waters of such rivers as the Olano, Zambro, &c., are the most adapted for it.

The "sewage water" of large towns, as that of Milan, is the most highly prized. The water passing through the subterranean channels of the town, and charged with an abundance of fermenting matter, is found "not only to retain a higher temperature, but further, to stimulate the productive power of the meadows, by deposits so rich as to excel every other species of manure. So abundant are these deposits, that the surface of the fields becomes speedily washed by them, and it is necessary at intervals of two or three years to lower the levels so as to insure easy irrigation. The material thus removed is greedily bought by cultivators in the vicinity as a most powerful and valuable manure." With reference to the use of the sewage of our large towns for agricultural purposes, we have in this brief notice of the system in use at Milan at once an example and a warning. Not much longer, surely, shall we contrive to perpetuate the folly of removing away that which properly applied would be highly valuable to agriculture. There may be differences of opinion as to the value of town sewage as compared with other manures; but all are agreed that there is in it

so much that is valuable that it certainly is worth the saving—and that it can be saved by plans so economical as to leave some margin of profit, we quite believe. But to this important question, the economization and application to agriculture of town sewage, we propose to return at an early period.

Before proceeding to describe the methods by which the sources of supply we have noticed are made available for the "marcite" system, we may here notice that of all these sources, that of the ordinary canals is most "in request with the cultivators," and this from the supply afforded by them being invariable. Again, with reference to the use of the surplus drainage waters, it has become a rule, where there are several meadows at different levels, irrigated from the same source, "to manure most richly those near the head of the supply, whether spring or canal, and to make the water itself the medium of conveying the manure to the others below. We are now prepared to glance briefly at the method adopted for the preparation of the land for the marcite system, and its produce results.

R. S. B.

## AGRICULTURAL EDUCATION.

In these brief papers it has not been our aim to suggest, or to take note of any suggestions which have been made in other quarters respecting plans or systems of education. This point has been discussed amply by able hands. We have been desirous chiefly to show how and in what way any plan or system can be best aided, and the important influence which a sound and healthy physical condition has upon the mental power. Nor can the importance of this question be over-rated: it bears closely upon the pecuniary condition of the farmer; to him it has a high money value. The Rev. Harry Stuart, A.M., in his admirable pamphlet\*, thus puts the case:—"Land can never be treated like any other raw material in its manufacture, on this very account; it must be manufactured by animal power. Animal power is as yet, and likely to continue generally to be, the moving power in cultivating the ground. \* \* \* And if steam could be substituted for horses, it would not matter so much to their employer what the *morale* of farm labourers was, as to profit; and the farmer, in a commercial way, would have all the latitude of dealing with them, and of treating them, that those have who work up their raw material by steam-power, and which the good or evil state of the minds of his workers cannot affect. It is very different with the farmer. His chief moving power is not only a very costly, but a very delicate, and also a very easily injured one; and its safety and efficiency must depend in a high degree upon the moral feelings of those who manage it. He has but one way, then, of dealing with them, if he would keep them in a proper state for the best working of this animal power; and that way can never be made a cheap one, without rendering their feelings and their treatment of this power hurtful and losing to him, in an untold way and degree." These are truths pregnant with meaning, and well worthy the attention of all employers. Here it will be observed that a labourer in a sound, healthy, mental condition, is not only likely to be a good worker himself; but a good, a just, and a merciful attendant upon the inferior workers, the lower animals entrusted to his care. Hence, by attending to

the condition of the labourer, we make a double profit; as on the other hand, by neglecting it, we incur a double loss. A reckless labourer, accustomed to indulge in brutal excitements, lost to all self-respect, can have no respect for the rights and property of others. Nor do we see how the substitution of steam for horse power in the work of a farm—an agricultural possibility, in the opinion of many, not far off realization—can ever make a servant of high *morale* less a matter of consequence to the farmer. A careful and a prudent man will just be as valuable when superintending steam engines and steam ploughs, as when looking after horses. We conceive, indeed, that a contrary effect will result from the introduction of inanimate mechanism: all merely manual labour—the easiest obtained and the least paid for—will be less desiderated; while higher and more frequent claims will be made upon the intelligence of the farm labourer. "No one," says Mr. Wren Hoskyns, in an able article on education in Morton's *Cyclopedia of Agriculture*, "has more experience than the farmer how much depends upon the intelligence and conduct of those whom his business obliges him to employ. The able body, valuable as it may be, is far behind the able mind, in the field as much as in the workshop. Even in the lowest employments of the farm, call it by what name you may—common sense, judgment, practical knowledge, or however else it may be disguised under various titles—it is knowledge which is most really valued and highly paid."

But while every effort should be made to establish schools in rural districts, and aid them by due attention to the points we have indicated—in which the *sons* of our agricultural labourers will get imparted to them that knowledge and those habits which will make them better workers and better men—provision for the education of their *daughters* must not be lost sight of. Girls' schools are, in fact, more important than boys'. This may and does appear a hazardous statement to offer; but a little consideration will show that it is a true one. There is no influence more potent, in forming the character of a man, than that of the fireside. It is there he learns habits, be these good or evil ones. A man brought up without this home influence differs materially in character, in his full development morally, from one who has experienced its salutary effects. And just as, little by little, the stone

\* "Agricultural Labourers: as they were, are, and should be, in their social condition." Second edition. 1s. Blackwood, Edinburgh and London.

is worn away by the water's constant dropping, so is the general impression made upon the mind of youth through the thousand-and-one influences continually at work around the family fireside. If these influences are good, out-door school education will strengthen and maintain them; if evil, the power of the same external education in counteracting them will be *nil*. It is useless to suppose that the *allopathic* doses of the fireside poison will be counteracted by the *homeopathic* antidotes of the school. And the guardian or dispenser of this mighty influence for good or evil, is the woman, the wife or the mother. "Among the working classes," says Dr. Booth, "and indeed some of the professional classes too, the father exercises very little influence or control over his children. The mother has to discharge, as it were, the moral duties of both parents; she is the centre of home influence; it is she who is to set the good example of sobriety, thrift, industry, cleanliness, motherly affection, skill in household matters, sufficient knowledge to be able to answer the prattling questions of her little ones." From this will be seen the range of duties she has to perform, and the responsibilities she has to bear;—and from this also will be seen the paramount importance of teaching our young females the nature of these duties, and how best to meet these responsibilities. Dr. Gilly, who has deeply investigated many points connected with the social elevation of the agricultural labourer, has the following: "The advantages of female education are not yet sufficiently appreciated or understood. Sewing, mending, making, and habits of housewifery, so essential to the character of a cottager's wife, are not to be learned in our village schools as they are at present constituted. A schoolmistress is wanted as well as a schoolmaster; and if you cannot have one in every parish, at least let there be some provision made for girls' schools in central spots, for the accommodation of a district; and then you will see a rapid improvement take place in the appearance and manners of our female population. We demand the services of our young females in the fields; but to counteract the rude tendencies of field services in females, we should be more anxious to educate them in a manner worthy of their sex. Wherever there is a girls' school, you are sure to discover its effects in the deportment and habits of the children and their mothers." Another, and not a slight advantage arising from the establishment of girls' schools of the nature above described, will be that the boys' school will be better attended. When mothers know the advantages of education, they will not be slack in making efforts to have them extended to their children. In the establishment of female schools, an essential point to be remembered is the combination of useful knowledge with the branches of what is usually

termed education. On this point Dr. Booth says—"I don't value at the worth of a straw any school for the labouring classes, however pretentious it may be, which does not alternate working with learning."

The subject which we have here opened up—is in no wise exhausted—is one of great importance. In relation to the extension of education in agricultural districts, it is scarcely possible to overrate it. One thoroughly up to the condition of our agricultural labourers, records it as his decided opinion that until "properly-equipped girls' schools are established in every district, so as to be convenient to the daughters of your labourers and ordinary farmers, all schemes for raising your labourers to the social condition they should be in, will be in a great measure defeated." This is occupying high ground; but the position can be easily maintained. If, as has been well said, "the health and purity of the social system are placed under the immediate guardianship of women," it is but a common-sense proceeding, and one dictated by the ordinary rules of prudence, to see that the girls, who in our agricultural districts are in after-times to be either the guardians or the enemies of the "health and purity of the social system," according as they themselves are brought up, shall have every attention paid to their training, that they may know at least the difference between the evil and the good. We cannot force them to choose the good and to eschew the evil, but we can at all events show them their moral responsibility, and leave them to their own discrimination. By training the females in the way indicated we begin at the beginning: all other attempts will be mere surface-work, resulting only in disappointment.

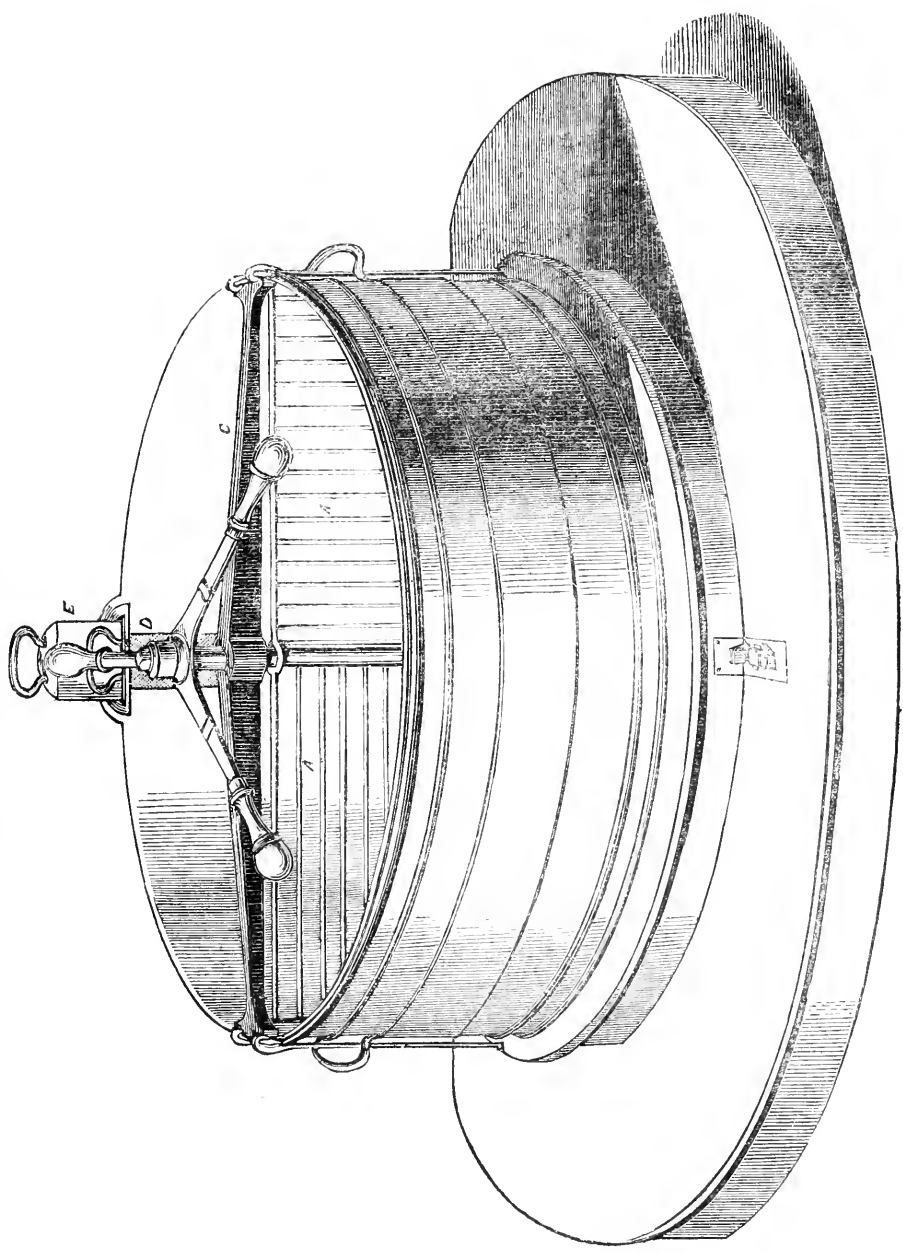
In the short series of papers—sufficient only to open up the subject—which we have been privileged to present to our readers, we have endeavoured to show that "agricultural education" has a much wider acceptation, and conveys a deeper meaning, than might at first sight be thought of. To give it a fair field for the exercise of its mighty influence, other influences must be set to work along with it—in conjunction—not merely to follow. Not only must a system of useful every-day practical education be inaugurated, but time must of necessity be given to those for whose benefit it is instituted, in order that they may be able to avail themselves of its advantages; while the home, the hearth influence, moral and physical, must be also attended to. To set all these influences at work, will demand much time and anxiety from those interested; but their labour will be repaid, and their reward given them, in the breaking up of the "stagnation" and in the enlightenment of the "darkness" of those minds at present too much under the influence of these depressing circumstances.

## KEEVIL'S PATENT CHEESE-MAKING APPARATUS.

We give an illustrated description of Keevil's Cheese-making Apparatus for cutting, filtering, and pressing curd. Milk, in the language of the dairyman, is composed of three substances—butter, cheese, and whey; and to separate the two former from the latter is one of the chief occupations of the dairy. Experience has long felt many difficulties in effecting this satisfactorily, partly owing to the rude manner in which the work has been done, and the still more antiquated character of the utensils of the dairy for doing it; and partly owing to the strength of affinity which exists between the articles thus wished to be separated. With such, Mr. Keevil, who occupies Strand Farm, at Lacok, near Chippenham, and who milks some 60 to 70 cows daily, is familiar, and

to obviate the same is the object of his patented cheese-making apparatus. And what makes the invention of the greater value is the fact that the finer the quality of the cheese, or rather the richer the milk from which the cheese is made, the greater the difficulties to be experienced under the old practice, as more of the cream and curd is separated with the whey than when the milk is poorer in quality. When milk is well watered to throw up cream, and three times thriftily skimmed, the processes of coagulation and separation of the whey are more easily effected than in the case of new-milk cheese. Now, as the public taste has not the same relish for skimmed-milk cheese of this quality as it had in the olden time, it consequently follows that more new-milk

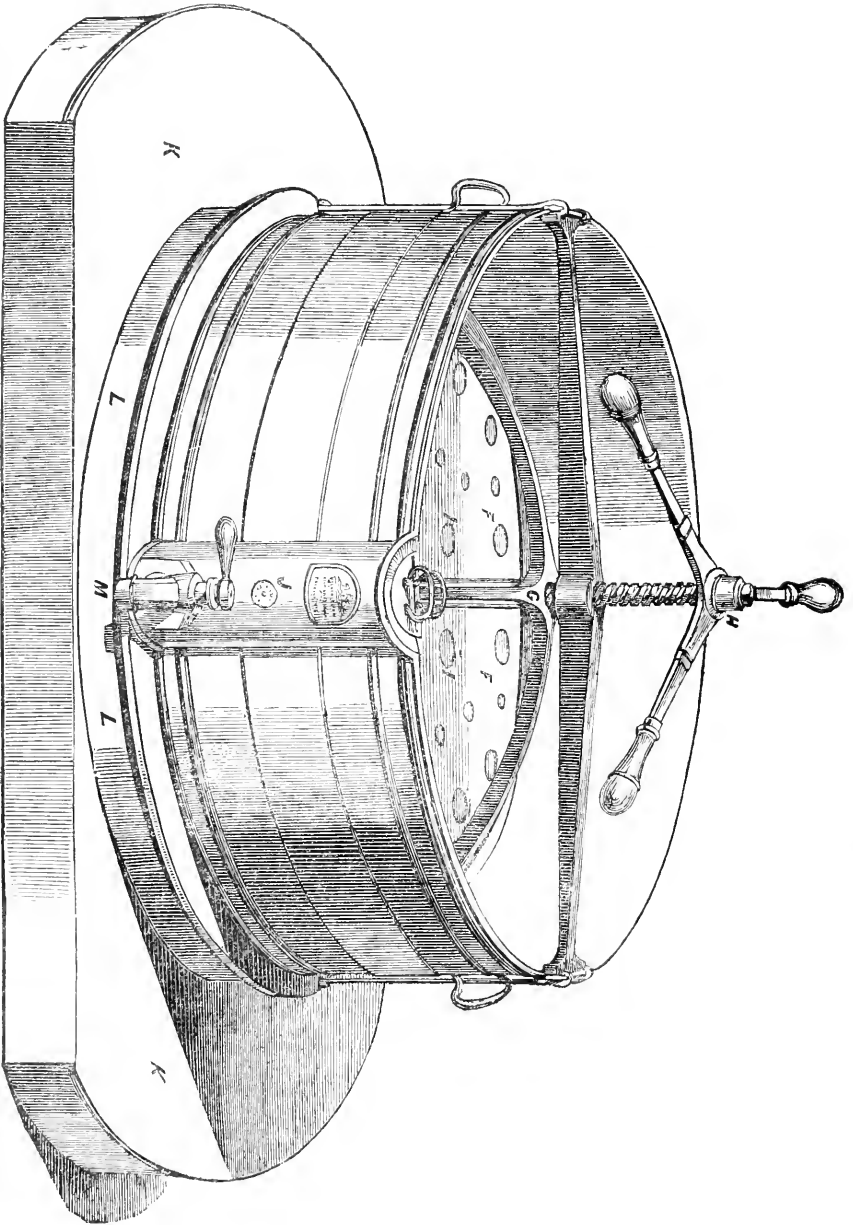
FIG. 1.  
BACK VIEW, WITH THE KNIVES IN FOR CUTTING THE CURD.



AA The knives, one-half of which are set perpendicular, the other horizontal. When turned slowly round by means of the handle, they cut the curd into small pieces.  
 CC A beam in which the knives turn.

D The filter through which the whey runs off.  
 E The plug which prevents the milk running through. It is here shown partly drawn out.

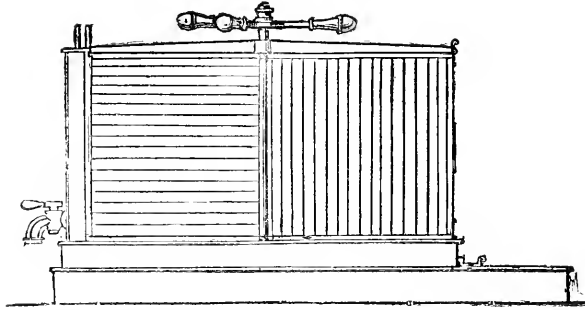
FIG. 4.  
FRONT VIEW, WITH THE PRESSING PLATE AND SCREW TO PRESS THE CURD DRY.



FP The pressing plate, which is put on the curd after the whey has run off.  
 G The arms or bearers which communicate the pressure of the screw H to the pressing plate.  
 H Holes to enable the air and whey to escape freely while the curd is being pressed.

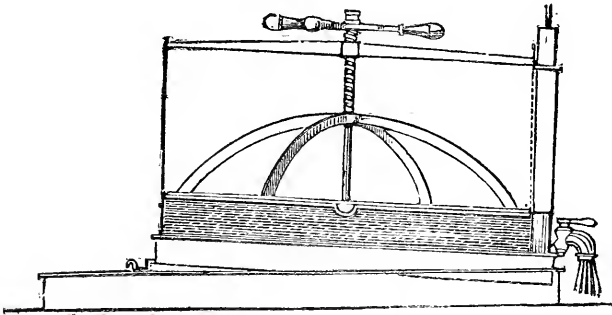
J The outer case in which the plug E fits.  
 K The platform, the centre of which L, (upon which the apparatus is fixed) works upon an axle, so that one side of the vessel may be easily lowered, and the whey drain to the tap M.

FIG. 2.



Section of platform and apparatus with knives in for cutting the curd.

FIG. 3.



Section of apparatus and platform. The apparatus with pressing plate and screw to press the curd dry. The platform is shown with one side lowered, to allow the whey to drain to the tap.

cheese must be made, and hence a greater loss sustained from the waste of cream and curd. The supply of foreign cheese is now so great in the English market, that the home farmer can only manufacture the best quality of articles with success, calling to his assistance all the mechanical means he can command; hence the growing importance of that under notice.

The apparatus consists of a large milk tub, as shown in figures 1 and 4, the former being a back view, and the latter a front view. Fig. 1 represents the tub empty, with the knives in, and everything ready for the milk being put into it for coagulation. The knives are shown in the section fig. 2, on a reduced scale, and fig. 3 is a section of fig. 4, also on a reduced scale.

In using the apparatus the following directions may be given:—When “the curd is set” sufficiently firm the knives are gently turned round, by means of the handles, cutting it (the curd) vertically and horizontally into small squares. The bar (C) across the mouth of the tub is then undone at each side, the spindle and frame of knives removed, and the curd allowed to settle for some twenty minutes. After it has fallen to the bottom, and the pure whey risen to the top, the semicircular plug (E) is drawn up, the top (M) turned, and the whey allowed to pass through the filter (D). As soon as the whey ceases to flow by the force of gravitation, a cheese cloth is spread over the curd, and the “pressing plate” applied, as seen in figs. 3 and 4. To prevent the curd rising at the sides of the plate, the cloth is put down between it and the tub. At first the pressure is light, so as not to squeeze out any of the cream and curd, the rule in

practice being to screw down the plate no faster than the whey flows clear, or in a limpid stream, along the gutter across the middle of the pressing plate to the filter seen in fig. 4. This part of the work will very much depend upon the quality of the curd, and therefore the dairyman will have to be guided by experience in this as in the old process. The pressing-plate may have once or twice to be removed—the curd cut back around the tub—placed in the middle, and the plate again applied until the whey is thoroughly removed, when the dry curd is broken and vatted in the usual manner. Throughout the process the general maxim is to disturb the curd as little as possible, and to drain off the whey clear.

In principle there is not much difference between Mr. Kcevil's practice and that pursued by our most successful cheese-makers, as will be seen from a short comparison. From time immemorial, for instance, the curd has been cut with a long cheese-knife into squares, and the whey taken off clear by means of cheese-bowls, perforated pressing plates having whey wells in them, tub-cloths, and weights for pressing down the plates. Thirty years ago we followed this practice. The only difficulty experienced was in getting dairymaids to carry it out properly. To do it successfully the process is an exceedingly slow one; and so prone are servants to take short cuts in such cases, that we always found a large quantity of cream and curd in the whey. In this respect Mr. Kcevil's apparatus has many advantages over the old, his process being more simple and cleanly, effecting a great economy of labour, and producing a

more uniform result in the separation of whey free from cream and curd—advantages in cheese-making whose value can scarcely be over-estimated. Its only faults are price and commission—faults which, we are given to understand, have been, to a certain extent, removed

since the Chelmsford Meeting; and if the patentee and manufacturer consult their own interest here, the apparatus cannot fail to prove an invaluable acquisition to the utensils of many a dairy during the period of the patent.

## THE LONDON, OR CENTRAL FARMERS' CLUB.

### FARM-YARD AND ARTIFICIAL MANURES.

The first monthly meeting of the season was held on Monday, Feb. 2, at the Club House, Blackfriars; Mr. Owen Wallis, of Overstone, Northampton, in the chair. The attendance was very good; the large room now appropriated to the discussions being quite full. Amongst others present were—Messrs. J. Pain (Beds), R. Baker (Writtle), T. E. Pawlett (Beds), T. Owen (Berks), H. Trethewey, J. Wood (Sussex), Rev. T. C. James, J. Howard (Beds), C. Howard (Beds), L. A. Cousmaker, J. Tyler, W. Bullock Webster, Spencer Skelton, E. Purser, J. B. Spear- ing, E. Little (Wilts), J. Thomas (Lidlington), J. Thomas (Bletsoe), J. Body, H. Hall, J. A. Nockolds, W. Heard, C. Hall, J. C. Nesbit, B. E. Ward, J. S. Ruston, S. Sidney, N. G. Barthropp, J. Kemp (Lincoln); Captain Barlow, J. G. King, G. Cobb, J. D. Poole, and Dr. Lewis.

The subject for discussion, selected at the instance of Mr. Robert Baker, of Writtle, was "The most judicious Management and Application of Farm-yard and Artificial Manures."

The CHAIRMAN said: In appearing before the members for the first time as President of the discussion meetings, he had to express his regret that he had not been able to attend more of the previous meetings, and to request the indulgence and support of the Club in the performance of the duties of his office. The subject which Mr. Baker had undertaken to introduce equalled in importance any that could possibly be brought before an assembly of farmers. There had been great diversity of opinion as to the treatment and application even of farm-yard manure; and since the introduction of so many varieties of artificial manure, the question had acquired increased importance. To choose the right thing for the right purpose, and to apply it under the most favourable circumstances, required no ordinary care and judgment. He was quite sure that the subject would be introduced by Mr. Baker with that ability which he had always displayed on such occasions.

Mr. BAKER said: He appeared before so many practical farmers on that occasion with a feeling of great deference, being conscious that there were many gentlemen present who were more competent to impart information than he was. He had no doubt, however, that the remarks which he had to make would be received in the same spirit in which they were offered; his object being to elucidate the management of farm-yard manure—to show how it could be best produced and most economically applied—and, having done that, to leave the further discussion of the subject to practical

men who were conversant with it. Speaking generally, he would observe that farm-yard manure consisted of what was produced from the refuse vegetable matter of the farm, and from straw, combined with the deposits of the animals, and was manufactured principally during winter, and foddered with cattle in summer. Having given this general definition, he should, in the remarks he was about to make, confine himself to the different qualities of farm-yard manure, and the different methods of producing it. They were all aware that such manure varied in quality with the description of food on which cattle were fed. If it were produced from vegetable substances alone, too much moisture, and too little of the nitrogenous matter of which it ought to be composed, would be found in it. Therefore it was by the combination of various kinds of substances—of substances of a nitrogenous and oleaginous character, with those chiefly contained in vegetables—that the largest quantity of valuable manure could be obtained. Under the altered circumstances in which they were placed, farmers had turned their attention very much to the utility of what are termed artificial manures; and he thought he might venture to say that they had in consequence lost sight, to a considerable extent, of the advantage of paying attention to the manufacture of manure by the ordinary modes. Manures were produced on farms in four different ways—by adopting the old principle of open farm-yards, surrounded by sheds or buildings; by covered farm-yards, where the entire surface was covered over, and the water prevented from falling upon the manure; by stall-feeding; and, lastly, by box-feeding. Those were the four methods which were most prevalent in this kingdom. Under the first of these systems, that of open yards, the great difficulty to be encountered was the large amount of water which at certain periods of the year fell upon the manure. Notwithstanding all the precautions that might be taken by the addition of spouts to the buildings, and so on, there were some periods of the year when, owing to the superabundance of rain, the deposits of the animals became too much mixed with water; and it was often the case that at a distance of half a mile from the farm-yard a stranger knew that he was approaching it, by seeing the residuum flowing down the roads, or the ditches that bordered upon them. To prevent this was of course a very great desideratum. This led him to consider the second method which had been devised for the production of farm-yard manure. This new system had not been introduced very largely on account of the expense which

attended it, the necessary outlay being too heavy for tenants to incur, and the matter not having met with sufficient consideration on the part of landlords: he referred, of course, to covered homestalls. There could be no doubt that if covered homestalls were erected on farms at the landlord's expense, he would receive back on his farm during a single lease the entire cost of construction; but the efforts which had been made to induce landlords generally to view the matter in that light had been attended with little success. Tenants in general were very willing to pay, in the shape of additional rent, a fair remuneration for the erection of such buildings; but, notwithstanding this, little progress had as yet been made in that direction. As he had before observed, the quality of manure must depend entirely on the description of food on which cattle were fed. The more grain, the more oilcake, linseed, and other food of the same kind, the animals consumed, the better would be the manure; and it was by the spirited conduct of men who spent large sums in the purchase of oilcake, linseed, and other artificial food, that some farms had been brought to such a high state of cultivation. Such was the opinion entertained of the advantage of substances of that description by some farmers, that, setting aside the question of profit on stock from the consumption of such food by neat cattle, they considered the advantage which was derived by the land from the food itself a full compensation for the outlay. He thought all present would agree with him, that if covered yards could be secured by every farmer, the result would be that less fodder would be required, and the manure would always be highly concentrated (Hear, hear). He now came to box-feeding. Under this system boxes of certain dimensions, say 10 feet square, were provided, and the animals were placed in them; floors were sunk two or three feet below the level, and by means of raising the trough in which the animal fed a large quantity of manure was produced in a highly concentrated state. It had been found in practice, that if a box contained less than 90 ft. of superficies, it did not answer so well as if it contained about 100; and it had therefore been assumed by many that 100 ft. should be the maximum, and 90 ft. the minimum. While he was adverting to this subject, it might be worth while to show how far boxes were better adapted for one description of animals than for another. It had been stated by one or two writers whom he had consulted on the subject, that male animals did better in boxes than females; and that the females did better when stalled than males. On the other hand, if they looked only to the quality of the manure, the manure of the heifer was far better under stall-feeding than that of the male, because it required less litter. A farmer who had steam machinery at hand might obviate that to a great extent by cutting the straw. When straw was cut about six inches long it was more favourable than it was previously for foddering cattle, and more economical in use; and after manure was made from it, it would be more beneficial in its various applications. Wherever this system was resorted to, there must be buildings expressly constructed for the purpose of carrying it out.

The only objection which he had heard started was, that there was so little compression in the angles or crevices of the boxes in which the cattle were fed, that the manure was apt to get into too dry a state, and was not equal in quality to that made in the centre. This might be remedied by rounding off the angles, and instead of having the boxes in the form of a square or parallelogram, making them in a heptagon form, so that the cattle would tread on all the dung alike. He would now speak of stall-feeding. Stall-feeding was a system which was generally resorted to in order to perfect the fattening of first-class cattle that were intended for market; and consequently the manure which was produced by such a process was of a highly concentrated character. Now if that manure were removed from the cattle day by day, as was frequently the case, it instantly entered into fermentation, and much of its valuable properties was lost. Whenever, therefore, cattle were fed in stalls, it was necessary to cart the manure daily to the yards, and spread it evenly over the surface, so that there would be a regular admixture of the best with the inferior portion. Too much care could not be bestowed on the spreading. If it were shot down in heaps very much injury would arise to the manure itself, as would be seen in the subsequent crop. Another plan, which was, he believed, first introduced by Mr. Mechi, was that of feeding cattle on latticed floors. Mr. Mechi and others had acted upon it to a considerable extent; and, as it did not appear to make way with the agricultural public, it was not, he presumed, found so beneficial as it had been represented to be. It struck him, on viewing Mr. Mechi's system in operation, and observing the manure accumulated beneath the lattice, that it would be a great improvement if the lattice were placed over an inclined plane formed of asphalt. The manure would then pass down the incline till it reached the outside; a little water would suffice to cleanse the incline, the cattle would be kept perfectly clean and sweet, and no portion of the manure would be lost. He might observe, in passing, that in adopting this system Mr. Mechi had another object in view besides that of preserving the manure, namely, the application of manure in a liquid state. He had seen the same system carried out very extensively by Mr. King Kall on his estate by Clare, in Suffolk. That gentleman grew a great quantity of red cloverseed, and the clover yielded a large amount of chaff, which was almost useless for farming purposes. Under these circumstances, it struck him that it would be well for him to keep a large number of pigs on the latticed floor. He did so, and his returns from pigs alone were from £1,400 to £1,500 per annum. The manure which was thus made formed a sort of artificial guano. When the time arrived for putting in barley, he sowed from one to two cwt. per acre: it was harrowed in, and the result had been most successful. Mr. King Kall had informed him that, mixed with chaff, this manure was equal to guano for any purpose connected with corn-crops. Having thus shown how farm-yard manure was manufactured, he had now to consider the quality of good farm-yard manure which was produced by the various methods in use. He



found, on investigation, that a cow feeding on 100lbs. of grass gave 71lbs. of solid and liquid deposit. An ox would produce  $1\frac{1}{4}$  cwt. while feeding on turnips or mangel-wurzel, and would require from 24 to 28lbs. of straw daily; in all, about 150lbs. of solid and liquid manure would be produced by an ox daily. This was in winter. An ox, if kept feeding continually on turnips, corn, and hay, in the ordinary mode, would produce, in the seven months of winter, about 12 tons of manure; and, if foddered in summer, about seven tons more. Thus it would, altogether, produce about 19 tons in the yard. In box-feeding an ox would consume about 21lbs. of straw daily, upon a hundred-feet range. In four months, a single ox of average weight, say from 80 to 90 stones of 8lbs. each, would produce about 11 cubic yards of manure; the production would be 33 cubic yards if it were constantly kept in a box for the whole year. Turnips would cause an ox to give the greatest quantity of liquid manure. Turnips or mangel-wurzel would yield more than swedes, and the litter required would be equal in weight to about one-third of the weight of the urine that the animal deposited. There were other things that affected the quality of manure. They all knew that horse-manure was far superior to that made from oxen, that manure made from oxen was superior to that made from cows, and that manure made from old or full-grown animals was far superior to that made from young animals. A cow in feeding extracted a larger portion of the nutritive qualities of food than an ox, because food passed more rapidly into the form of milk than that of muscle. Again: nearly all that the older animals consumed went to the formation of fat and muscle, whereas much of that the younger ones consumed was absorbed in the production of bone: consequently, the largest proportion of manuring qualities came from the deposits of the animals which were producing the most fat and muscle. It might be supposed that, if a certain number of animals were kept in an open yard, and their deposits were not allowed to escape in any way whatever, the manure would be as good as what was produced by the same number of animals in a covered yard. That, however, was not the case. The manure of animals kept in covered yards was, in fact, superior in quality to that of animals kept in open yards. The horses kept on the farm were the chief source of the manure which was produced. He would here remark that many farmers, in estimating the advantages of employing steam-machinery for various agricultural purposes, seemed to forget that there was no direct return from the application of steam, whereas there was a considerable return in the case of horses, as regarded the cultivation of the soil (Hear, hear). Horse-manure was very beneficial to the land. It contained a larger proportion of ammoniacal and nitrogenous ingredients than any other kind of farm-yard manure. That the urine of the horse was of a very superior description was evident from the effects witnessed in those patches of the soil where it had fallen. In the feeding of horses it was found that the animal produced in solid manure and urine three-fourths in weight of what it consumed. A well-fed horse would give  $9\frac{1}{2}$  tons of solid and liquid manure per annum, and

would require  $2\frac{1}{2}$  tons of straw; altogether it would make in a stable 12 tons of manure per annum. The difference in quantity of manure as between the horse and the ox was not much; the difference in quality was very great. As, however, much manure was necessarily wasted when a horse was in the field, they of course could not assume as much to be made as if he were constantly under cover and foddered. He now came to the question how much manure 100 acres of good arable land might be made to produce in a year. If they assumed that the farm would produce  $\frac{1}{4}$  qrs. of wheat per acre, 6 qrs. of barley, 7 or 8 qrs. of oats, and 3 or 4 qrs. of peas and beans, they could then tell how much manure it ought to yield. He maintained that it would produce sufficient manure in four years to manure it over once, at the rate of 16 tons per acre; though if it were manured by two operations instead of one, the benefit derived would be much greater. For every acre there would be 16 tons of manure made off the farm, if it were well managed. This quantity he held to be quite enough to keep the farm in a good state of cultivation; but if, in addition, some guano were imported on the farm for the production of roots, cultivation would be carried on more beneficially. He came now to sheep manure. It had of late become the practice to bring sheep into yards for feeding. Some writers had asserted that sheep would fatten faster if kept warm, than if exposed to inclement weather in a field. No doubt, as a general principle, animals enjoyed warmth and comfort, and had a tendency to fatten faster under such advantages than when exposed to cold; because, in the latter case, a very large proportion of their food went to the mere production of animal heat; whereas, in the former, it was employed in producing fat and muscle. Nevertheless, he held that the field was the proper place for sheep (Hear, hear). Sheep never appeared so comfortable in a yard as in the field; and recourse to the former was attended with this disadvantage, that a less quantity of manure was made by 100 sheep in a yard than the same number in a field. In Norfolk, Suffolk, and many other districts of England, a very large portion of the land was well adapted for the feeding of sheep, the manure being no sooner deposited on the land than it was fixed by the action of the animal's feet. Sheep manure required, more than any other description of manure, to be fixed quickly. If it were trodden into the soil, all the ammonia was secured at once; whereas, if it remained in an open yard, it was apt to get into a state of fermentation. If it were carted from a yard in warm weather, put on the land in heaps, and then fermented, half of its valuable qualities would be lost. It should, therefore, if obtained from a yard, be carted as quickly as possible to the land, and ploughed in at once, so as to secure all the ammonia. Now, having thus directed attention to the manufacture or production of manure, and the quantity obtainable, he would next allude to the management of it after it was produced. It was well known that the common oxygen of the air they breathed, on coming in contact with carbon, engendered animal heat. So also was it with manure-heaps. If a quantity of straw saturated with the deposits of animals were shot into heaps, and if, from

the looseness of the heaps, the air entered the manure, then the oxygen, combining with the carbon, produced heat, fermentation followed, the constituent portions of the manure were converted into gases, and a large proportion of the most valuable properties of the manure was inevitably lost. It was therefore evident that the only means of retaining the constituent properties of manure was by preventing it from getting into a state of fermentation. He admitted that root-crops, and especially turnips, would grow better through the application of decomposed manure than through the application of manure carted direct from the yard; but this arose chiefly from the circumstance of the woody parts of the manure being more broken down than they would otherwise be, and therefore more readily appropriated by the plants. If they lost one-third of the quality of the manure in reducing it to the state which was best for the turnip, the effects of that loss would be seen, not perhaps in the turnip-crop, but in the succeeding crop. It was evident therefore that the best mode of applying manure was to take it direct from the farm-yard, and turn it in at once, so as not to leave it exposed on the surface. If, however, excessively neat farming were considered a desideratum, and if turnips of a very superior quality were required, the manure might be first decomposed. However disposed farmers might be to proceed scientifically, they were generally governed by other considerations, and especially by the state of the weather. Manure could only be carted on the land when little injury would be done in the process; and if, as was sometimes the case, it was carted in a wet autumn, the injury thus caused outweighed any benefit which the farmer could reasonably expect. It followed from what he had before said that if manure were left in a concentrated state, free from the action of the air so as to prevent fermentation, a larger amount of its constituent properties would be retained than under an opposite system. If there were an excavation three or four feet deep, and from twelve to sixteen feet wide, manure shot into that excavation, and well consolidated there, would not enter into a state of fermentation, and consequently all the constituent properties of the manure would be retained until it was applied to the land. In like manner a shady position was preferable to one where the manure would be exposed to the action of sun and air. In whatever way the thing was done, the manure should be consolidated as much as possible, the sides and ends trimmed off cleanly, and the surface covered with about a foot of earth, and well beaten down so as to render any escape of gas impossible. Many practical farmers maintained, as he had before intimated, that the best manure for turnips was decomposed manure. He granted that such was the case; but, then, it was produced at a considerable loss. If it must be applied in that state, the question was how the decomposition might be best effected. Shortly before conveying it to the field, say twelve or fourteen days, they should turn over the heap, when it would, of course, enter into active fermentation; they should then cover it with earth or some substance to prevent the escape of ammonia; and in that state of fermentation when, as it was said,

it would neither dig nor fork, it was in the best condition for being applied to the land. There was another mode of application to which he would allude. When manure was carried to the field for the production of turnips, it was sometimes taken out of the cart and spread on the ridges, and as soon as the ridges were formed the manure was ploughed in immediately. Another plan was to shoot it down in heaps on the flat; and farmers were frequently seen to go on for one or two days carting manure, and then ploughing it in all at once. In the first case the management would be judicious if the manure, on being taken out of the cart, was covered immediately. The other method was an injudicious one. The management should be such, that as fast as the manure was carted out, it was ploughed in as fast as the ploughing was performed, the seed was deposited; and if the process was carried out uniformly, there would, no doubt, be a good crop of plants. There was another system which was practised throughout the whole of the corn-growing districts of the kingdom; he referred to the system of top-dressing. In his own experience he had never found manures act so beneficially as when they were applied to clovers in the autumn. The covering of clover layers with manure in November, after the cold weather had set in, the manure being spread evenly over the surface, and lying exposed during the winter, proved very beneficial to the clover and wheat crops. Every farmer who wished to carry out the details of farm management in the most beneficial manner should manure his young seeds or clover on the same principle as if he were manuring directly for wheat. It was also the practice in many counties to manure old clover layers directly after the first math was removed; and if a second math was taken, he did not think so much damage was likely to ensue as some had supposed. This, he knew, appeared contrary to the principles of good management. No doubt the exposure of the manure on the surface of the soil deprived it of a considerable portion of its constituent properties; but the loss was compensated for, in the benefit derived by the clover; and we need hardly say that if they got a good crop of clover they were almost sure of a good crop of wheat (Hear, hear). The application of manure to root crops was a matter that deserved great attention from farmers. They frequently found that for the production of a crop of mangel wurzel, twenty loads per acre of the best manure the farm would produce were applied. Twenty loads carted and spread could not be estimated at less than £6 per acre. Such was the power of this root, that to whatever extent it might be manured, it extracted most of the constituent properties of the manure. Since the introduction of guano, however, and other artificial manures, a very large proportion of this consumption has been saved to the farmer. By applying 3 cwt. of guano at a cost say of 40s. per acre, and adding a little salt, an excellent crop of mangel wurzel could be secured. Consequently farmers were much indebted to guano for the production of root crops. Now, as the statement of the subject on the card included artificial manures, he felt that it was due to the club that he should make some remarks with regard to them. As to the first on the list—guano—they had in that a very different substance to deal with in the ensuing year from what they had had in the last year. Instead of continuing to pay 11s. or 12s. per cwt., they had now to contend with an advance of from 20 to 25 per cent. in the price. He had always felt that the importation of guano into this country, in the manner in which it was conducted, was a great monopoly. The Government

had suffered one of the most useful substances that had ever been introduced into this country to be monopolized by one or two individuals; those individuals fixed the price at whatever amount they thought proper; and though they told them to-day that the price was £15 per ton, to-morrow it might be £20, and they must comply with the terms. (Hear, hear). As a citizen of the State, and as one who contributed largely towards the maintenance of our powerful marine establishment, he contended that the Government ought not to have sanctioned this monopoly. It was, he maintained, the duty of the Royal Agricultural Society and of that Club to address the Government on the subject, and to tell them that they ought not to tolerate an arrangement by which Messrs. Gibbs and Co. had the sole control of the importation of guano, and exacted from farmers whatever price they pleased. It was not enough for the Royal Agricultural Society or any other society to offer a reward of £500 or £1,000 for the discovery of a manure equal to guano. The case required to be dealt with in a more effectual manner. As the matter stood, guano threatened to become an article rather of luxury than of use, and something must be done to meet the altered state of things. Now, as regarded the application of guano, it had been shown by Mr. Vernon, as the result of experiment, that the direct application of it for grain crops ought never to exceed 2 cwt. per acre, and that the use of a larger quantity did not increase the quantity of grain, though it enhanced the cost of production. It had also been ascertained by investigation that if guano were applied as a top dressing for grain, it ought never to be applied in at one operation, but it should be applied partly in April, and partly at the latter end of May. It was more beneficial when applied in two dressings than when applied in one. If guano were applied in a dry state, and where there had been a continuance of dry weather for a long time, its most valuable properties were dissipated, and little benefit was derived, whether by grain or root crops. This shows the necessity of applying guano when the land was in a sufficiently moist state, because then it immediately becomes incorporated with the soil, and all its gaseous ammonia is fixed. In the case of turnips, it should be applied not at the ploughing for the turnip crop, but at the previous ploughing. On being sown it should be turned in with a shallow furrow, and rolled down, and it should then remain until the season arrived for sowing the turnips. Ten or twelve days after, the guano may be brought near to the surface. Under that mode of proceeding no portion of its fertilizing powers would be lost. Another great fertilizer was soot. Soot was about equal to guano as to the effects it produced, though it required to be used in large quantities. If it were used as a top-dressing during the prevalence of the dry winds of March very little benefit accrued; but if it were applied during rainy weather or a moist state of the atmosphere, great benefit was derived from it. He had for many years used from 1,000 to 2,000 bushels of soot per annum. In some years the effects which it produced were exceedingly good, while in others they were scarcely visible: the difference arose from its being applied in the one case in dry weather, and in the other in moist weather. Another useful manuring substance was salt. Of this he did not think farmers generally applied enough to the land. If salt were always sprinkled on manure heaps as they were carted out, the benefit would be distinctly visible in the quantity and the quality of the subsequent crops. Salt applied in small quantities was beneficial for wheat, and upon all land where there was too great a tendency to produce straw an application of salt would

check that tendency, and also increase the grain-producing powers of the soil. Sea-weed, again, was said to be highly beneficial; but as he knew nothing of its effects from personal experience, he would leave others to speak of them. Of the valuable properties of superphosphate of lime and bones he need say nothing to a meeting like that. Having thus spoken of what might be termed natural manures, he would say a word or two with regard to those manures which were strictly artificial, and in which there was now so much competition. Some of these manures were very valuable, and their utility was becoming more and more appreciated. He would recommend all present, in procuring them, not to deal with any but persons of repute, and persons whom they knew to be trustworthy. He had had samples of manure sent to him as presents by manufacturers, accompanied with a request that he would be kind enough to state his opinions as to the results. Having tried the experiment, and found the result satisfactory, he could not do otherwise than report favourably: but what was the consequence? Why, he was afterwards blamed by farmers, who said that in consequence of seeing his name appended to a certificate, they had bought manure which produced no such effect as had been described. The truth was, that the manure sent to him, and that which was afterwards sold to his friends, were totally different in quality (laughter). This showed the necessity of caution in purchasing artificial manures. There ought in all cases to be a written guarantee as to the constituent properties of the article; and then, if these were wanting, the seller could be held responsible. The urate he had found very serviceable. Blood-manure and wool manure were also used with great advantage—which was the best or the cheapest he was unable to say. To show the necessity of vigilance in such matters, he would remark that about two years ago a new article was announced as being exceedingly beneficial; and it was observed that it was much cheaper than guano. After a large number of persons had been caught by this statement, the matter was investigated, and it was afterwards declared in print that an article which was sold for £7 per ton was not worth more than from 25s. to 30s. An action was threatened; but the fear of the trade in the article being cut up root and branch by exposure, prevented it from being brought. There were many other branches of the subject into which he might enter, but he had already trespassed too long, and must refrain from speaking of chalk, lime, marl, and other manuring substances of an inorganic character. He would only remark, in conclusion, that if he had said anything that was likely to advance the cause of agriculture, if he had put forth any ideas which were likely (to use a hackneyed phrase) to make two blades of grass or two ears of corn grow where only one grew before, he should be quite satisfied. He felt thankful for having had the attention of a class of men whom he respected more than any other class of the community, esteeming no labour too great if he did but succeed in obtaining their approbation (cheers).

MR. SIDNEY (of Fockham), did not concur in Mr. Baker's remarks with regard to the importation of guano. Peruvian guano stood in a somewhat similar position to our own iron and coal, and in France and Germany many persons might be heard complaining of the monopoly of this country in these articles, and of the hardship to them of England's being able to manufacture cheaper than most continental countries. The English Government had no right to prevent Peru—a very poor country—from making the best of almost the only source of wealth she possessed. He would not recommend farmers, however, contentedly to pay an enormous price for guano. What he suggested was,

that they should try to obtain supplies from some other quarter. This country had the largest marine in the world, and yet hardly any attempt had hitherto been made to discover guano in any other situation than that from which it had been obtained. It was well known that it was only in rainless zones that guano could exist, but those zones had not yet been explored as they should be, with the view of extending the sources of supply.

Mr. NOCKOLDS (of Stanstead, Essex), asked whether, when Mr. Baker had manured for mangold-wurtzel or other roots with guano, salt, and farmyard dung, he found any difference in the succeeding crop?

Mr. BAKER: The crop was better after farmyard manure than after guano, inasmuch as the mangold-wurtzel was more exhaustive of guano than of farmyard dung.

Mr. NOCKOLDS: Then the whole value of the farmyard dung was not spent by the root-crop?

Mr. BAKER: Certainly not.

Mr. NOCKOLDS: With regard to sheep and manure, he remembered seeing, a year or two before Lord Leicester's death, that nobleman's sheep, kept in enclosed yards, which his lordship contended was the best way of treating them. Now Lord Leicester's sheep were chiefly Spanish merinos and Anglo-merinos; and the question was, whether the warmth they got in the enclosed yards was not beneficial in some degree to the growth of wool.

Mr. BAKER: Undoubtedly it was.

Mr. NOCKOLDS thought, however, that the open air was best for sheep, and that their wool was benefited by a certain amount of cold; for if they transferred a sheep to the East Indies, they would find that it lost its wool, and, instead of growing wool, grew hair. He would suggest, therefore, that the open air was preferable to the enclosed yard for sheep (Hear, hear).

Mr. PAIN (of Felmersham, Beds), said there were some points with respect to the application of manure which he should like to receive some information upon; and, with that object in view, he begged to state what his own practice had been. As to mangold-wurtzel, then, his practice in dealing with that was, to cart the manure on the land in autumn, plough it in, and allow it to remain until the following spring, when, as soon as the weather was favourable, he took an opportunity of working the surface of the soil, having first applied two or three cwt. of guano to it per acre. The guano being thus worked in, he next rolled the soil, and proceeded immediately to put in the seed; and hitherto, by the adoption of this practice, he had succeeded very well. The more solid the ground could be made for mangel-wurzel the better; for with artificial manure the land required to be in that condition to keep the crop growing and bring it to maturity. In the management of the turnip crop, he always deferred carting his manure until late in the spring, in order to prevent the escape of ammonia; and instead of covering his dunghills with earth, as was Mr. Baker's method, he generally covered them with about 4 or 6 inches of salt, which effectually accomplished that object. In this state he allowed the heaps to remain until within a week or ten days of the time when he required to use them. He then turned them over, and put in the manure for his turnip crop. On all farms the manure was drawn out at a given period, and he had invariably found that, if it were carted in heaps, and the carts drawn over them for the purpose of making them as solid as possible, with a good layer of salt, there was no fear of the ammonia being lost.

Mr. PURSER (of the London Manure Company) said there was a great disposition on the part of the farmers to

cast blame upon Messrs. Gibbs, in reference to the price of guano; but he could assure them that those gentlemen had no more to do with the matter than any gentleman then in the room. The guano of Peru was, in fact, pawned to the Peruvian bondholders, who took upon themselves to fix its price from time to time. As far as the supply of guano was concerned, he apprehended they would see very little brought to this country before the end of March; it became them, therefore, to consider what they were to use as a substitute for it. His experience taught him that the chief demand for guano prevailed from January to the end of April, presuming that it was more particularly used for wheat, barley, and oats. That was also the experience of Messrs. Gibbs. For the turnip crop they would, of course, resort to phosphates and other manures containing smaller proportions of nitrogen; but a substitute for the present emergency was what they had chiefly to look to, and his own practice had shown him that a judicious mixture of sulphate of ammonia, combined with superphosphate of lime in salt, was one of the best top-dressings for wheat. For the barley crop there certainly was no manure that had uniformly answered so well as guano; and for oats he should consider nitrate of soda, as a top-dressing, would be most beneficial.

Dr. LEWIS (Physician to the Post Office), thought some of Mr. Baker's observations with respect to the loss of manure might perhaps be a little fortified by what he was about to submit to the meeting. In the last number of the Registrar-General's Quarterly Returns it was stated that the mortality among the families, and especially the children, of farmers was very great indeed, as compared with the mortality among many other classes of the community. This fact was the more remarkable, because the rate of mortality among such persons ought to be very small. Farmers and their families had the advantage of open country and fresh air in a much greater degree than the inhabitants of towns; they had, generally speaking, good unadulterated food, which a large portion of the town population had a difficulty in obtaining; and for these and other reasons it might well have been supposed that the mortality among them was comparatively low. The question was, then, what made it so high as it was on good authority stated to be? He had no doubt—and in his opinion he was corroborated by what fell from Mr. Baker—that it was caused by the impurity of the atmosphere around the dwellings of farmers; that impurity proceeds from the dung heaps and the accumulations of manure, solid and liquid, in the vicinity. The Registrar-General observed very truly that farmers were very clean in their dairies, and that the greatest care was taken to prevent specks of dirt from spoiling the appearance of the butter and cheese, but that they were far less careful as regarded the effect of the surrounding atmosphere upon their own health and that of their families. Unfortunately, the emanations which were so injurious were invisible to the eye; and that was the reason, perhaps, why they were so little thought of. The best test, however, in such cases, was the lungs of young children; and these could not be healthy where they were constantly exposed to the influence of ammoniacal and nitrogenous substances. The fact that many farmers, including some whom he had the pleasure of seeing, attained old age and looked robust, did not at all militate against what he was saying. There were many examples of the most prolonged life in the unhealthiest districts in England; and therefore it was by no means to be concluded from the circumstance that many farmers reached old age, that their residences were healthy. The mortality was to be estimated by taking the number of children in families, and ascertaining the average population reared. The practical

deduction which he wished to submit to the consideration of all present was, that by putting a stop to such a state of things as Mr. Baker had described, which was, that gentleman stated, such that, half-a-mile from a farm-house, you might tell that you were approaching it, simply by the emanations which proceeded from the yard—by putting a stop, he said, to this state of things, they would be securing the most valuable fertilizing substances in their manure, and at the same time providing for the health of their children. Having studied the subject under discussion for some time, in connexion with botany, he was glad to find that farmers were now viewing the matter under a more scientific aspect than they did some years ago. In former times, it was customary for them to put a manure consisting of they knew not what, on a soil consisting of they knew not what, to produce a crop consisting of they knew not what. He was now delighted and proud, as an Englishman, to perceive that English farmers were setting an example to the whole world, and adapting themselves to the altered circumstances of the times in which they lived (Hear, hear).

Mr. J. C. NESBIT (of Kennington) could confirm, from his own observation and from inquiry, what Mr. Baker had said with regard to the utility of applying manure to the clover crop. He could bear testimony that such an application greatly increased the production of the subsequent wheat crop. Under such a mode of operation, two things took place which tended to benefit the farmer—the soluble substances in the manure spread on the young clover were speedily washed into the soil, and the covering acted as a protection against the frost and cold. With respect to guano, he was certainly surprised to hear Mr. Baker speak in such an anti-commercial manner. The matter was one that rested with the Peruvian Government. As to Messrs. Gibbs and Company, he believed they had no more power to fix the price of the article than that Club had; and he had no doubt that, if they could have done so, they would have prevented the rise which had taken place. What it behoved farmers to do, in the present state of things, was to look out for some other source of supply. It should be borne in mind that the real source of guano was the ocean itself. The bird fed upon fish; and it was, he believed, to the fish that surrounded our coast in such countless myriads that they must look for an efficient means of supplying the future wants of the country. Every effort ought to be made to discover some satisfactory mode of manufacturing the fish which abounded along our coasts into a nitrogenous manure; and if the hardy and industrious population that lived on the borders of the sea once became aware that there were persons ready to take off their hands any amount of fish they could supply, there would be no difficulty, he believed, in obtaining a sufficient quantity. There was, in fact, no other resource than this to fall upon. In a few years the deposits of guano in the Pacific Ocean would have been removed; it would then absolutely be necessary to have some substitute for guano, and this, he believed, was to be found in the fish near our own coasts.

Mr. KEMP (of Thurlby, Lincoln), had for years carted all his farmyard manure fresh out of the yard, and used it, while new, for his seeds, by which means he secured the best crop that his farm would yield, whether for grazing or mowing. That was also, he believed, the best mode of using garden manure, and it was decidedly economical. They ought not, he maintained, to use farmyard manure for the turnip crop. He had not used it for that purpose himself for years, having found it more beneficial for seeds. His artificial manures he always applied in a liquid state. Mr. Baker had intimated that they might as well do nothing as sow

guano during the dry winds of March. He remembered seeing, while travelling through Yorkshire, five or six wag-gons laden with soot standing in a field; and on his inquiring what they did there? the reply was that they were "waiting for rain!" the weather being at the time very dry. Had that manure been applied to the wheat or barley in a liquid state, which was by far the best and most economical mode of applying it, there would have been no occasion to wait for rain, and the benefit would have been seen at once. All artificial manures, whether used for turnips or as a top-dressing for corn, ought to be applied in a liquid state. He was sorry to hear some gentlemen speak of guano as if it were impossible to find a substitute for it. Had they not, he would ask, a substitute within reach at that very moment? What became of all the guano—he meant the sewage—of the metropolis? What became of the soap-suds of the farm-house, the dish-washings and other refuse in their dwellings? At one period he was utterly at a loss to know how to apply liquids to the land; but when Chandler's liquid manure drill made its appearance he got over the difficulty at once. He had since constructed near his house a large tank, into which everything in the shape of soap-suds, dish-washings, &c., was made to pass; and the deposits in that tank were worth at least £20 a-year to him, whereas formerly they all flowed into the river. Let farmers only direct their attention to the proper use of liquid manure and sewage matter, and he was convinced they would no longer stand in need of guano. The other day, while travelling, he fell into the company of a very intelligent gardener, and he took the opportunity of questioning him with regard to his mode of applying manure. This person told him that he had been in the habit of making experiments with regard to the relative advantages of solid and liquid manures, and that, having applied them in equal quantities for a crop of rhubarb, he found that the liquid manure gave 30 per cent. more produce than the solid. Such a fact as that was very startling, and the mention of it should be sufficient to induce farmers to pay more attention to the use of liquid manures.

The Rev. T. C. JAMES (of Ermington, Devon), expressed the pleasure he felt at seeing so many young men present. He thought he could not do better than recommend all who desired further information on the subject to go to Messrs. Whittaker's, the publishers, before leaving London, and invest 6d in the purchase of a useful little book, "On the Preservation of Natural Manures," being a lecture delivered at the annual meeting of the Bakewell Farmers' Club, by Alexander McDougall.

The CHAIRMAN wished to make a few remarks before the discussion was brought to a close. They had all heard, for many years, a great deal about the deterioration of manures by the escape of ammonia, when they were applied on the surface. His own experience, long since, led him to regard that notion as a myth, and he was glad now to have had his opinion confirmed by an able article published in the last number of the Journal of the Royal Agricultural Society, emanating from the pen of Dr. Voelcker, professor of chemistry at the College at Cirencester. He (the Chairman) believed that manure was never so advantageously applied as when it was laid on the surface, and that so far from deteriorating or losing anything through exposure to the atmosphere, it caused more benefit to the upper soil, where it was desirable that its effects should be most apparent. It was the practice of a very extensive turnip grower in his own neighbourhood to draw his manure out on the land in May or June, and there leave it exposed. The reason given for pursuing that course being that the dryer the weather the better would be the ultimate effects. Having ploughed it in once, he then

ploughed it out again, and he said that the more it lay on the surface the finer was the crop. When the notion about manure suffering deterioration by the escape of the ammonia was first promulgated, he (the Chairman) took care to have his manure carted on the land, ploughed in, and covered up as snugly as possible; but it happened, somehow or other, that the turnips of a neighbour who was a "slovenly farmer," and who adopted a different course, using common rotten straw, while his manure was the very best, would get away from him a week or a fortnight in his crop—a result which he could only attribute to the fact that in the one case the manure was applied to the surface, and in the other it was not. A friend of his, Mr. Shaw, was, too, at this moment occupied in manuring his turnip land; but, instead of ploughing in the manure, he contented himself with merely scuffling it in; thus corroborating what he had stated to be his own experience in the matter. He would now read to the club what Professor Voelcker said on this subject:—

Having described at length my experiments with farmyard manure, it may not be amiss to state briefly the more prominent and practically interesting points which have been developed in the course of this investigation. I would, therefore, observe—

1. Perfectly fresh farmyard manure contains but a small proportion of free ammonia.

2. The nitrogen in fresh dung exists principally in the state of insoluble nitrogenised matter.

\* \* \* \* \*

6. The most effectual means of preventing loss in fertilising matters is to cart the manure directly in the field whenever circumstances allow this to be done.

7. On all soils with a moderate proportion of clay, no fear need be entertained of valuable fertilising substances becoming wasted if the manure cannot be ploughed in at once. Fresh, and even well-rotted, dung contains very little free ammonia; and since active fermentation, and with it the further evolution of free ammonia, is stopped by spreading out the manure on the field, valuable volatile manuring matters cannot escape into the air, by adopting this plan. As soils with a moderate proportion of clay possess in a remarkable degree the power of absorbing and retaining manuring matters, none of the saline and soluble organic constituents are wasted even by a heavy fall of rain. It may, indeed, be questioned whether it is more advisable to plough in the manure at once, or to let it be for some time on the surface, and to give the rain full opportunity to wash it into the soil. It appears to me a matter of the greatest importance to regulate the application of manure to our fields, so that its constituents may become properly diluted and uniformly distributed amongst a large mass of soil. By ploughing in the manure at once, it appears to me this desirable end cannot be reached so perfectly as by allowing the rain to wash in gradually the manure evenly spread on the surface of the field. By adopting such a course, in case practical experience should confirm my theoretical reasoning, the objection could no longer be maintained that the land is not ready for carting manure upon it. I am much inclined to recommend as a general rule: cart the manure on the field, spread it at once, and wait for a favourable opportunity to plough it in. In the case of clay soils, I have no hesitation to say the manure may be spread even six months before it is ploughed in, without losing any appreciable quantity of manuring matters. I am perfectly aware that, on stiff clay-land, farm-yard manure, more especially long dung, when ploughed in before the frost sets in, exercises a most beneficial action by keeping the soil loose and admitting the free access of frost, which pulverizes the land; and would therefore by no means recommend to leave the manure spread on the surface without ploughing it in. All I wish to enforce is, that when no other choice is left but either to set up the manure in a heap in a corner of the field, or to spread it on the field, without ploughing it in directly, to adopt the latter plan. In the case of very light sandy soils it may perhaps not be advisable to spread out the manure a long time before it is ploughed in, since such soils do not possess the power of retaining manuring matters in any marked degree. On light sandy soils I would suggest

to manure with well-fermented dung shortly before the crop intended to be grown is sown.

8. Well-rotten dung contains likewise little free ammonia, but a very much larger proportion of soluble organic and saline mineral matters than fresh manure.

9. Rotten dung is richer in nitrogen than fresh.

10. Weight for weight, rotten dung is more valuable than fresh.

11. In the fermentation of dung a very considerable proportion of the organic matters in fresh manure is dissipated into the air in the form of carbonic acid and other gases.

12. Properly regulated, however, the fermentation of dung is not attended with any great loss of nitrogen nor of saline mineral matters.

13. During the fermentation of dung, ulmic, humic, and other organic acids are formed, as well as gypsum, which fix the ammonia generated in the decomposition of the nitrogenised constituents of dung.

14. During the fermentation of dung the phosphate of lime which it contains is rendered more soluble than in fresh manure.

15. In the interior and heated portions of manure-heaps ammonia is given off; but, on passing into the external and cold layers of dung-heaps, the free ammonia is retained in the heap.

16. Ammonia is not given off from the surface of well-compressed dung heaps, but on turning manure heaps it is wasted in appreciable quantities. Dung heaps for this reason should not be turned more frequently than absolutely necessary.

17. No advantage appears to result from carrying on the fermentation of dung too far, but every disadvantage.

18. Farmyard manure becomes deteriorated in value, when kept in heaps exposed to the weather; the more the longer it is kept.

19. The loss in manuring matters, which is incurred in keeping manure heaps exposed to the weather, is not so much due to the volatilisation of ammonia, as to the removal of ammoniacal salts, soluble nitrogenised organic matters, and valuable mineral matters, by the rain which falls in the period during which the manure is kept.

20. If rain is excluded from dung heaps, or little rain falls at a time, the loss in ammonia is trifling, and no saline matters of course are removed; but if much rain falls, especially if it descends in heavy showers upon the dung heap, a serious loss in ammonia, soluble organic matters, phosphate of lime, and salts of potash, is incurred, and the manure becomes rapidly deteriorated in value, whilst at the same time it is diminished in weight.

He had read this portion of Dr. Voelcker's article, because it appeared fully to confirm his (the Chairman's) own practice. Being no chemist himself, he was, he admitted, at one time working completely in the dark as regarded this question (Hear, hear).

Mr. BAKER, in his reply, said that, notwithstanding the opinion of Dr. Voelcker, he still maintained that the excessive stirring of manure, and the subjecting of it to a great degree of fermentation, injured its quality, and that it became farmers to guard as far as was practicable against that evil.

On the motion of Mr. THOMAS (of Bletsoe), seconded by Mr. PAIN (of Bedford), the following resolution was adopted:—

"That the judicious management of farm-yard and artificial manures is to preserve their various constituent properties from waste by fermentation or exposure to atmospheric action, and that their qualities are more fully secured by assimilating them with the soil as speedily as possible."

On the motion of Mr. PAIN, seconded by Mr. WOOD, thanks were voted to Mr. Baker for the able manner in which the subject was introduced by him; and a similar compliment having, on the motion of Mr. Trethewy, been paid to the Chairman, the meeting separated.

## THE MANURE DIFFICULTY AND ITS SOLUTION.

The ancient philosopher, who could not get every thing he wanted, wisely made up his mind to do without it. The English farmer is just at present in a position to profit by so admirable an example. It is not, perhaps, the first time in his life that he has found himself in similar circumstances. He has often, indeed, ere this had to avail himself of the precedent we have quoted. When landlords have frowned, or law-Lords have turned their backs on him, he has taken his good friends Patience and Perseverance, one on each arm, and gone on as well as he could. It is remarkable, too, how famously he can go, having once made up his mind to trust to himself. Farming was wont to be considered a delightfully independent, self-supporting sort of business, where you baked your own bread, brewed your own beer, killed your own pigs, and literally lived on what you made at it. We have got a little beyond this, and rank no longer merely as a beer-and-bacon-consuming people. We are more advanced, and have consequently more wants. There are occasions, however, when we may have need to fall back on the glorious independence of our primitive condition—to do without what we cannot get, or supply it in some way or other for ourselves.

Other we repeat, that we are in some such a strait just at this moment. With very commendable forethought, however, we have already had a consultation amongst ourselves as to what is to be done. The members of the Central Farmers' Club have had a meeting on the subject of manures. It was very well attended, with representatives of the class interested from many different parts of the kingdom. Mr. Baker, the Nestor of the society, was called upon to open the proceedings; and he did so with very excellent judgment. He had to treat of manures home-made and artificial or extraneous; and he made the former the great topic of his discourse. He went seriatim through the several modes still in practice; while he recommended what his own experience told him were the best. He showed not merely what the farmer could do for himself here, but what the landlord might do to help him. Like almost all matters connected with agriculture, this making of manure is also a double-barrelled question. The old-fashioned open farmyard, with its Styx-like streams running out of it, and dangerous passages across it, will do no longer. There are better systems; but, of course, these require better buildings. The point comes home to the landlords at once. They would seem, however, scarcely as yet to have felt the force of it:—"This new system had not been introduced very largely, on account of the expense which attended it, the necessary outlay being too heavy for tenants to incur, and the matter not having met with sufficient consideration on the part of landlords: he (Mr. Baker) referred, of course, to covered home-stalls. There could be no doubt that if covered home-stalls were erected on farms at the landlord's expense, he would receive back on his farm during a single lease the entire cost of construction; but the efforts which had been made to induce landlords generally to view the matter in that light had been attended with little success. Tenants in general were very willing to pay, in the shape of additional rent, a fair remuneration for the erection of such buildings; but, notwithstanding this, little progress had as yet been made in that direction."

We question very much if there be not some fault

or neglect on both sides. In the rage for artificial stimulants, there is little doubt but that the farmer has often made the least, rather than the most, of his own resources. As Mr. Baker himself says: "Under the altered circumstances in which they were placed, farmers had turned their attention very much to the utility of what are termed artificial manures; and he thought he might venture to say that they had in consequence lost sight, to a considerable extent, of the advantage of paying attention to the manufacture of manure by the ordinary modes." Another alteration of circumstances may bring them back to this. The whole tone of the discussion went to warrant such an opinion. Owing to some extraordinary neglect, or maybe some more studied design, it would appear we are to have scarcely any guano at all for the approaching season of its use. With this fact put palpably before him, every one saw the necessity of placing himself in a condition to be able to do without it hereafter. Guano even now is not an absolute requirement for good cultivation. There is a certain facility in its operation, an easy means of obtaining an end, that will always make it more or less popular. At the same time it is a stimulant that has not half, if any, of the lasting effect of farm-yard manure. As Sir Tatton Sykes' authority, Mr. Jorrocks, says, "muck's your man" after all. We could name one of the best farmers in England—a prize exhibitor at our national meetings, and a prize-taker for crops in his own county—who has not used an ounce of guano for years past.

But what's to be used instead of it? "Muck's your man" to begin with—covered yards, box-feeding, or stall-feeding, as circumstances may allow, or landlords be answerable for. This is the strong feature of the whole case. Then, of course, there are other artificial manures to be employed, on the understanding that they are obtained only of respectable dealers. This is another very impressive point. There has been almost as much trickery of late years in the manufacture of manures as there has been in railway shares, or the reputable business of banking. The security here is to know something of the people you are dealing with—to never be attracted by cheap prices, and not to depend entirely upon testimonials. Mr. Baker says with amusing naïveté—"He had had samples of manure sent to him as presents by manufacturers, accompanied with a request that he would be kind enough to state his opinions as to the results. Having tried the experiment, and found the result satisfactory, he could not do otherwise than report favourably; but what was the consequence? Why, he was afterwards blamed by farmers, who said that, in consequence of seeing his name appended to a certificate, they bought manure which produced no such effect as had been described. The truth was, that the manure sent to him, and that which was afterwards sold to his friends, were totally different in quality. This showed the necessity of caution in purchasing artificial manures. There ought in all cases to be a written guarantee as to the constituent properties of the article; and then, if these were wanting, the seller could be held responsible." There is too much truth in all this; and poor Mr. Baker, with his fair fame and integrity of purpose, has often, no doubt, though unwittingly enough, been made a capital decoy-duck. The moral, however, is sufficiently plain; let the victim put it about in some way

or other how he has been served, and let a tricky firm never have but one chance.

Then, again, there are other substitutes more under our own control. According to one gentleman, the universal panacea is Chandler's drill, and converting everything into liquid manure—a wholesale argument that few will subscribe to. Liquid manure is all very well in time and place; but its application under many circumstances is known to be something more than a mistake. It is the fashion of over-riding these hobbies that brings us so often to grief. The sewage of towns, too, should be made more use of—when anyone will be kind enough to prove how it will pay to do so. Mr. Nesbit, logically following out the question before the House, suggests the fish on our coasts as the substitute for what is after all but composed of fish. There is nothing that has been more dwelt on than this. We should be afraid to say how many fish manure companies we have heard of; or how successively the

difficulties encountered in the outset have overthrown them. To be attempted with any promise of success, an undertaking of this kind should be on the most gigantic scale. After a while, perhaps, we might collect fish as methodically as we have done bones. Still the per-centage of valuable matter in fish is very small; and it is quite an open matter yet whether it could be obtained and offered at a rate sufficiently low to command a large sale—the only principle upon which such a business could be carried on.

The discussion was altogether well-timed, and cannot fail to do good. Nearly every variety of practice came in for some consideration; at the same time practice and science did not appear always to agree. The opinion of Dr. Voelcker and the opinion of the Farmers' Club are on a certain point or so a little at variance. Fortunately, it is the comparison and discussion over these little differences which lead eventually to so great an amount of good. They put people "a thinking."

## A FARMER AMONG THE CHEMISTS.

### LETTER III.

MY DEAR BERZELIUS,—Like some other ladies, "Dame Nature" is accustomed to refresh herself with ammonia; but what relative proportions of it she may inhale as "smelling-salts," imbibe as "sal volatile," or apply externally as "hartshorn-embrocation"—that is to say, how much is abstracted by leaves from the air, how much drunk up in solution by roots, or how much sucked in by leaves from the rain and dew which wet them—is a piece of chemical statistics not yet furnished to the agricultural public. The testimony of some great authorities quoted in my last, and of others to be adduced in the present letter, can scarcely be considered positive and decisive. For the statements are either wavering and uncertain, directly conflicting, or assumptive and comfortably evading the difficulty, while there are but one or two clear rays of illumination in the general obscurity.

In the *Farmer's Magazine* for 1842, absorption of ammonia by foliage was ridiculed. "It is said, indeed, that some plants possess the means of appropriating this gas by their leaves; and we see it gravely announced that a frugal farmer might improve his rotation by taking an occasional crop of Jerusalem artichoke—a plant found to be eminently endowed with the faculty of finding in the sky that indispensable but costly azotic element which wheat in particular carries off from the soil." In 1850 the *Gardener's Chronicle* said, "Among the more important facts which recent chemistry has demonstrated is, that plants naturally derive the ammonia which is so necessary to them from the atmosphere. Thrown into the air in the form of a carbonate, it is immediately dissolved in the vapour eternally present; and when that vapour is precipitated as rain, it is conveyed to the earth and to all the foliage that intercepts it. Absorbed by the *leaves*, sucked up by the *roots*, it adds intensity to the green colour and vigour to all the powers of vegetation."

I turn now to Morton's *Cyclopædia of Agriculture*, and there find practical men taking for granted that the leaf inhales ammonia. Mr. Hannam seems to imply that ammonia, or nitrogen in some shape, enters into some plants above-ground, by saying that "after a green crop is ploughed-in for manure, the soil is richer by the carbon, oxygen, hydrogen and nitrogen, which the green crop has obtained from sources independent of the soil." Mr. Haxton affirms

that the growth of the turnip is promoted by "the powerfully absorptive properties of the *leaves* in collecting ammonia and carbonic acid from the atmosphere." And in another place: "In a damp climate the *leaves* of wheat are constantly receiving ammonia from the moisture in the atmosphere." The scientific authorities (in the same *Cyclopædia*) are more guarded. Professor Buckman thinks that the existence of ammonia in the atmosphere "accounts for numerous species of plants being suspended without contact with the soil. It also accounts for the growth of such plants as lichens on granite rocks, or even on glass, where it is impossible that their contained nitrogen can have been derived from the medium on which they grow. Indeed, it has been a subject of much discussion as to whether plants in general derive their nitrogen from the soil or from the atmosphere. The examples of air-plants, such as *oromelias* and *orchids*, show that [*some*] plants can obtain nitrogen without contact with the soil. On the other hand, ammoniacal manures are known to be of great use, and to produce great fertility; but whether from being absorbed by the *roots*, or from being *exhaled around the plants* under the influence of heat, is a matter we cannot yet decide upon." Dr. Voelcker writes: "It appears to be very likely that, whilst wheat, barley, and in a smaller degree oats, are principally dependent for their supply of nitrogen on the nitrogenized constituents of the *soil*, clover, lucerne, and other crops, which are characterized by an abundant *foliage*, can draw their supply of nitrogen from the atmosphere in one form or the other." In another place: "Although it cannot be denied that plants absorb the ammonia of the atmosphere, it is nevertheless true that this property of absorbing and elaborating the atmospheric ammonia in sufficiently large quantities is shared by comparatively few plants." Professor Way, however, brings something resembling reliable testimony to the point. He says, "The beautiful experiments of Priestley, Saussure, Daubeny, and others, have taught us that by means of their leaves plants decompose carbonic acid, which is always present in the air; and further, that from the volatile carbonate and nitrate of ammonia they derive supplies of nitrogen for the formation of their albuminous constituents." Still, it is hardly clear whether he means that they "derive" this "volatile carbonate, &c.," by their *leaves*. Lastly, Dr. Lindley tells us that "the *leaf* absorbs vapour and gaseous



matters from the atmosphere, especially water, carbonic acid, oxygen, and ammonia; there is some reason too to suspect that free nitrogen may be taken up." Here then is a distinct and unequivocal statement; the substantiating proofs of which, I suppose, may be met with somewhere.

Most, but not all, of the above authorities agree that vegetables feed on ammonia by means of their roots; but, as you see, they differ considerably, or furnish little proof, upon the question of its extraction from the atmosphere by leaves. And whether all, or only some, or which of my crops rob the soil, or the air, or both, of the mysteriously-energetic agent, I am left to find out elsewhere.

My last letter contained a word or two respecting the importance of this question; which I will now still further insist upon. Prosy practitioners of husbandry may think that if nitrogen be known to accumulate (no matter how) in certain kinds of cropping, without impoverishing the soil of that element—at least, as far as manuring is concerned—common sense will direct us not to lavish our costly nitrogenous manure upon those crops, but save it for other kinds, if such there be, during the growth of which no such accumulation takes place; and that this amount of knowledge is sufficient for business purposes, without speculating as to the precise manner in which the gain of nitrogen has naturally accrued. They may say, "If we have found out which are the good-natured plants that enrich instead of beggaring our land, as long as they retain this convenient and profitable habit why need we trouble our heads as to how they forage for us?"

But such men never inquire "how the apples got in," as long as their pudding continues pretty good eating they never enter into the significance of astronomical discoveries, provided their East India-men arrive safely with cargo: they never ask about the laws of distribution of metalliferous deposits, while their private workings continue to hold out. You, Berzelius, have studied agricultural science, not to gather rough rules that may be immediately available for temporary use and profit, but to construct a chart of principles and lasting landmarks, so that a great art may be steered along the true course without needing to lose time in vainly seeking its way up all sorts of fair-looking inlets and deceptive channels. You know, from the analogy of other sciences, that the true theory of cultivation (or whatever you please to call it) cannot be discovered until the

nature and operations of the things cultivated are plainly understood, and that without the guidance of demonstrated principles, all empirical rules and recipes are liable at any moment to be proved fallacious. And I need not say much to convince you that we are ignorant of a very important item of knowledge respecting the habits of a crop, when we know not whether (for the sake of nitrogen) it asks of us ample space for leafage, or deeply-pulverized and well-aerated feeding-ground for its roots. Let me be sure that a certain kind of crop draws in ammonia mainly by its roots, and I shall confidently seek improvement in modes of tillage, hoe between the rows of plants, and feed them with nitrogenous manure, say before the time of blooming, or just at such periods as analysis may prove large quantities of ammonia are assimilated; and I shall spend no energy uselessly upon developing the leaf. On the other hand, let me be aware that another crop obtains its ammonia chiefly by the leaf, and I shall look for its better management and more economical production in a freer access of air to the plants, and a forcing of them into a precocious and expanded foliage; while the amount of nitrogen within reach of the roots will not concern me at all. I shall endeavour to favour the plants in their eagerness for the invigorating gas, instead of fallowing, pulverizing, and manuring to azotise the soil. Spared such an expense, I shall invite them to "fall to, and help themselves," not out of my dishes, but to a feast of the inexhaustible fertilizer carried by the winds,—like as sulphuric-acid makers extract cheap oxygen from the atmosphere, instead of buying it in an expensive mineral form. I might sometimes manure the root for the purpose of swelling the leaf; or I might encourage the leaf for the sake of augmenting the capabilities of the root: but once having certitude as to which organ was the principal agent to be fed, trained and cared for in every crop, my efforts after improved culture would be concentrated above or below-ground, as the case might be; I should know that there alone, if anywhere, progress might be made, and so push along that path, instead of waiting the chances of unlooked-for discovery.

But, I see, I am running away from the question of the value of this knowledge to agricultural science, and am trying to show how it would advantage agricultural practice; so that my next communication must touch upon this point before proceeding to other subjects.

Yours, &c., J. A. C.

## PROBUS DISTRICT PLOUGHING MATCH.

This annual ploughing match took place on Tuesday, Feb. 10th, in a field at Treverbyn, in the occupation of Mr. John Stephens, in the parish of Probus. The field was of large extent, more than twenty acres, a five or six years' ley, and in excellent condition. Twenty-nine ploughs competed for the prizes. The work done by the double or turnwrest ploughs was very good; but the work by the single ploughs was not so good as might have been expected, probably owing to the men not having been accustomed to them. All the single ploughs were of good construction, being made after those of Messrs. Howard, Ransome, and other good implement makers. The three single ploughs which won the best prizes were made by Mr. Gerrans, of Tregouy; and the double or turnwrest ploughs were almost all made in the county. The weather was fine, and there was a large number of agriculturists in the field. The stewards of the field were Mr. John Stephens, of Treverbyn, and Mr. Robert Hearle, of Carvean. The judges of the ploughing were Mr. James, of Merther; Mr. James Davis, of St. Ewe, and Mr. James Chapman, of St. Ermo.

A dynamometer was used in the field to test the draught of the different ploughs.

The dinner took place at the Hawkin's Arms. There was a large attendance, consisting of between sixty and seventy, who were presided over by Mr. Richard Davey, of Redruth and Polsue, supported by the Rev. Prebendary Barnes, of Probus, the Rev. H. Boyd, Mr. Trethewy, Mr. Tresawna, and other agriculturists of the neighbourhood: Mr. W. Trethewy occupying the vice-chair.

After the usual loyal toasts were drunk, the Rev. H. Boyd, in responding to "the Church", expressed his pleasure in being present at the meeting, and also at an earlier part of the day's proceedings when he witnessed the skill shown in the field at Treverbyn. He had no claim to much practical skill as an agriculturist, but still he might claim the interest, if not of a producer, of a consumer; and the interest of one who considered agriculture to be one of the most enjoyable as well as useful occupations to which a man could turn his hands or his head. During the last few years he had had the opportunity of witnessing agricul-

ture under very different phases. He had not only been in England, but abroad in the far lands of the East, where, he need not tell them, farming was very different from what it was in England. He then gave an interesting description of the hilly and level country in the Holy Land, their different soils, and the ploughing, sowing, and ingathering of the harvest in that land. During the last two years he had been living in a county which ranked among the foremost of the counties of England in agricultural progress—Lincolnshire. Many of the farmers there possessed very large capital, and many of the farms counted their acres not by hundreds, but by thousands. Many of the fields contained fifty, one hundred, two hundred, and he had even heard of more than three hundred acres being under one enclosure. A great difference struck one on coming down from Lincolnshire to Cornwall. A stranger at the first glance might pass an unwarranted and unjust judgment. Like results cannot be expected where conditions were different; one must take into account the character of the soil and the temperature of the climate. He could imagine a sharp and clever man, with all his new notions in his head, coming down from the east country into Cornwall, and finding himself like a fish out of water, and only after repeated failures and taking hints from his neighbours, learning how best to manage a farm in the West of England.

Mr. KARKEEK said, in returning thanks for his health being drunk in connection with the "Royal Agricultural Society," some of the previous speakers had spoken of the great improvement that had taken place in agriculture; and he believed a great deal of that improvement was attributable to the Royal Agricultural Society, in awarding liberal prizes for the exhibition of breeding cattle, and particularly agricultural implements. A short time since they offered a premium to any person who would produce a manure equal in fertilising properties to guano, capable of being produced in large quantities, and sold at £5 per ton. Now if ever the society showed a degree of illiberality, they did in that instance. If it were in the power of any man to produce a manure equal to Peruvian guano, they should have offered a prize for it, equivalent to the great boon it would confer upon the United Kingdom; instead of which they offered the paltry premium of £1,000. He had lately been informed on good authority, that Antony Gibbs & Co., who are the sole agents for the sale of Peruvian guano, have said: "Talk about £1,000! we are ready to give a hundred thousand, and not a hundred thousand only, but a hundred thousand pounds per annum to any man who will produce a manure equal to the Peruvian guano, and not for only £5 a ton, but we will give £10." He alluded to this, because they all knew that at the present time Peruvian guano was at a very high price, and a great deal of blame had been attributed to A. Gibbs & Co. on that account. But depend upon it, it was not their fault; he knew, from good authority, that they had objected to the rise taking place. The fact was that the whole sale of Peruvian guano was in the hands of the Peruvian bondholders, who raise and lower the market as they please. No blame, therefore, was to be attributed to Antony Gibbs, though his name was often brought before the public in that way, and with a degree of illiberality he did not deserve.

Mr. TRETHERY considered the work in the field that day was exceedingly well performed, with a few exceptions. The first opening out of the ground with some of the single ploughs was not in that order it should be, but they very much mended as they progressed, and on the whole he should say the work was very well done. He was sorry to differ from their worthy chairman respecting deep ploughing in that county. As far as he had seen, in many instances it had not succeeded; he had never seen subsoiling attended with any good effect. It was true there were some soils in the county which could not be ploughed too deep, but he was speaking of the soils generally. Where there was a good subsoil, it was certainly of importance to mix it with the upper soil; but if they examined the different cuttings of the railway and other places, they could see there would be little benefit derived from mixing the upper with the subsoil. Also, where much guano or other artificial manure was used, he considered the more it was concentrated and kept at the surface the better. He agreed with the chairman, that on light soils such manures passed through much quicker

than they did on stiffer soils, with a clay subsoil; but notwithstanding that, if they ploughed very deep, they had little effect from the manure afterwards. It was the practice in many counties to get a good deep mould, and he believed it held the moisture and the manure better, where they had something to work on; but in that county it was generally very different. He saw some soil not long since worked by their worthy chairman, and that could not be ploughed much too deep, for whatever stones were brought up one year, they were crushed into mould the next, or the year following, and could not do much damage; but where they ploughed down the upper soil, and brought up as bad or worse, he thought it must be injurious. In some parts of Gloucestershire there was very deep ploughing; but in other parts they only scratched the back-bone of the rocks; those lands were on the oolite, and if they went deeper they lost their manure; and it was much the same in that county. As to the ploughs used that day, he thought there seemed to be prevailing fashions in ploughs as in other things. A few years since there was scarcely such a thing as a turnwrest plough, often improperly called a double plough. But at length the turnwrest ploughs came into general use, improvements were made in them, and at last it was thought no other ploughs were equal to them. The turnwrest ploughs in fact, in the hilly ground, were turning down the tops of the fields to the bottom, which rendered the upper part of the field quite useless, whilst the quantity of soil brought down was more than was required. In going over a farm with a tenant, who had a long two-acre field, and very sloping, he saw that the top of the field had been stripped by repeated ploughings, and a large portion of the soil turned down to the bottom, so that the farmer had only half of the field under the plough, and after some time would have none. Furze and brambles had taken possession of the soil at the top, and followed down after the plough. He told him he saw the plough had notice to quit, being driven out by the brambles and furze. In Devonshire and Kent there were turnwrest ploughs, but not in many other counties, or in Scotland. They there ploughed straight up and down the hill, and consequently the soil drained itself. He did not know whether the common ploughs were not better for ordinary purposes than the turnwrest ploughs they used so generally in that district.

The CHAIRMAN explained that he had only given his opinion that deep ploughing was good, and had been proved so, where it was practicable. As to applying it pell-mell to any kind of land, that might be very injurious. If he were going to-morrow to lay down a field, and intended to come to deep ploughing hereafter, he should turn up only about an inch at a time. He had found the greatest advantage from subsoiling; he had tried it after the wheat stubble then put in the green crops, and the succeeding crop of barley had been enormous.

Mr. TRETHERY said many would confirm his statement that they had never seen any benefit from subsoiling in that neighbourhood.

The CHAIRMAN remarked, it would not answer unless there was depth of soil.

Mr. KARKEEK said he did not think some of them had applied manure when they had got up the subsoil.

Mr. KARKEEK, upon being referred to in reference to the farm of the Chairman, at Philleigh, observed that he had taken some notes on his recent visit to that place; and after apologising for the brief manner in which they were taken, said Mr. Tressawna, Mr. Trethewy, Mr. Christopher Whitford, Mr. Henry Croggon, and himself were present. The notes were as follows:—"Some attention having been excited during the past two months relative to Mr. Davey's new system of feeding cattle on Polsne farm, and Mr. Davey having given a very kind invitation in reply to an intimation of our wishes to inspect the farm, we proceeded on Thursday last to fulfil the visit, of which we now proceed to give a brief account. We found the cattle, North Devons, thirty-two in number, kept in separate boxes in two houses recently built. They were fed in wooden troughs eighteen inches wide by twelve inches deep, with a mixture of grated turnips and chaff straw in the proportion of ninety pounds of the former to seven pounds of the latter, mixed in the following manner. The grated turnips (swedes) are intimately mixed with the chaff in a bin suf-

ficiently large to supply the cattle with one day's food. These ingredients are allowed to remain in the bin three days, during which time considerable fermentation and heat are produced in the mass, sufficient to cook the whole, as if it had been submitted to the power of steam. We observed that an odour is emitted during the fermentation similar to fresh brewer's grains, evidently the consequence of the saccharine matter evolved from the roots and chaff. There were three bins constantly at work in this manner, so as to afford a regular daily supply. 97lbs. of this mixture is given to each animal, and 4lbs. of linseed cake per day, in the following manner:—

- 1st feed 6 o'clock a.m. mixture of chaff and turnips.
- 2nd do. 9 o'clock a.m. ditto.
- 3rd do. 12 o'clock noon 4lbs. cake.
- 4th do. 1 o'clock p.m. mixture.
- 5th do. 4 o'clock p.m. ditto.

In addition to this, about 3lbs. of dry chaff is given during the evening. The cattle are exceedingly fond of the mixture, so much so, that there has been some difficulty experienced in getting them to eat the linseed cake. In ordinary feeding with turnips, it is always observed that cattle will consume the cake in preference to roots, but not so in this case, as the mixture is preferred to the cake. We estimated the cost of feeding cattle in this manner at about 6s. per week. It very evidently agreed with them in a remarkable manner, as the whole number were in an exceedingly thriving condition. They were purchased about ten weeks since, and placed in the boxes on this new system of feeding eight weeks, and many of them were fat enough for the butcher. We paid particular attention to the boxes and their construction. They were eight and a-half feet square. The dung was allowed to accumulate until it rose to about two feet, when it was removed—about two months' accumulation—each box averaging six loads of very rich manure. Our attention was also directed to the method adopted in keeping the store pigs. The piggery consisted of a covered building about thirty-three feet square; three feet below, and adjoining the farm stable at one end, containing eight powerful grey labour horses; and three feet below the oxen house, containing eight oxen, but with room enough for twelve head of cattle at the other end. The piggery was separated from the oxen-house and stable by two doors. The litter from these departments is duly mixed and distributed over the piggery, so that in fact we here found a complete manure manufactory, carried on by the pigs, forty in number; and notwithstanding this daily accumulation of horses, cattle, and pigs' dung, the piggery was clean, dry, and without any disagreeable odour. The manure there manufactured was exceedingly rich, averaging two hundred loads removed every three months during the six winter months of the year. The pigs were usually fed with the fermented turnips three days old, which was prepared in three tubs constantly at work, according to the method adopted for the feeding cattle. Within the last fortnight some damaged barley had been given in addition to the fermented turnips, and we certainly never witnessed forty pigs together in such a happy, contented, and thriving condition. The buildings were admirably arranged for the greatest economy of labour. There was a powerful corn-crusher, a chaff-cutter, and root-grater in an upper store room, worked by one horse, and the chaff and grated turnip were dropped through shoots into the bins below in the lower store room, where the mixing and fermenting took place. The store-rooms were about forty feet by twenty-five each. We must not omit mentioning the mode by which the food was conveyed to the different feeding departments. This was managed by a tram wagon worked on rails and a turn-table, by which it was directed either to the stable, oxen house, or feeding houses as required. Here the economy of labour appeared complete, as the whole of the feeding department was easily conducted by a man and a boy, who manufactured the food and fed all the cattle and pigs, and had the charge of two hundred sheep in addition. We should add that this system of feeding is both simple and inexpensive, and could easily be adopted on any sized farm; and we would particularly recommend our neighbours to take the opportunity of making themselves acquainted with the whole of the details by personal observation. The construction of the

feeding house is well worthy of their attention; also the dairy cows'-house and yards attached, which were sufficiently large to accommodate sixteen cows. There is one circumstance connected with these buildings, which will be certain to attract the observation of any visitor, viz., the absence of disagreeable smells and the perfect cleanliness in every department. Regularity in feeding and cleanliness is highly important in successful feeding of cattle, and this desideratum is particularly attended to on Polsue estate. We have made some inquiries respecting the cost of the root pulpers and graters, and we find that Phillips's patent pulper costs from £6 10s. to £12 12s.; Bentall's patent root pulper from £5 5s. to £9 9s.; and Bushe and Barter's grater, manufactured by Ransomes and Sims, a machine very similar in construction to Mr. Davey's, may be purchased for £4 10s. This appears to be a simple, strong, and lasting implement. The roots are delivered from the machine in a grated state, and it is easily worked by one man." [Mr. Tresawna here remarked that the piggery was covered.]

The CHAIRMAN said it was known to most of them that agriculture was not his original avocation, and that it was not many years since he turned his pick and gad into a ploughshare; but having now put his hand to the plough, he believed he should not turn back. He had felt a great interest in agriculture, and had travelled to see all the model and example farms worthy of notice, from the Land's End to John-o'-Groat's House, and certainly something might be picked up from all of them; but whilst he had seen something to copy in all, he had also seen much to avoid. The principal failure of the farms he had visited was in the farm buildings, which were inconvenient and insufficient to accommodate the tenant, and enable him to return the produce of the farm to the best advantage. How often did they see a heap of manure left on a bank to evaporate by the action of the sun and wind, or to drain away or stagnate in the ditches! How could a man farm properly unless he had the means? He did not lay all the blame to the landlords; he thought it was their duty to assist, but he thought the tenants should pay something per cent. on the money laid out. He believed many a landlord would do something for his tenantry if they would meet him in the cost. Some time ago he told a man he would lay out £200 on his farm in buildings; but the man said, "I won't thank you for it, and won't pay you anything for it," consequently it was not done. He had always felt great interest in agricultural matters. The feeding of cattle on fermented roots, which Mr. Karkeek had mentioned, he had seen abroad, but had not formerly room to convert a sufficient quantity into food to last three days. He had now been enabled to do that at Polsue, and he was sure any farmer going there to see it would be well pleased, and they were quite welcome to see it.

Mr. TRETHEY, referring to the statements Mr. Karkeek had read, said in the feeding at 6s. per week at Polsue, the value of the manure was not taken into account. If that was done, the cost would be nothing like 6s. a week. Chaff was consumed, and the turnips and oilcake were charged. [Mr. JAMES, of Merther, here asked what the chaff consisted of, to which the CHAIRMAN replied any straw he happened to have from thrashing.] Mr. Trethey further said he never saw cattle looking more contented than at Polsue; he could see from their appearance of comfort that they were doing well; and he had no doubt, if they had been weighed from week to week, they would have been found to increase rapidly. As to the pigs, they appeared to be doing better than any animals he ever saw on the food they had, which was perhaps due, in a great measure, to the warmth of the piggery. He then mentioned some returns of the Registrar-General as proving that warmth was best both for man and animals.

Mr. KARKEEK also made some remarks on the beneficial influence of warmth in the feeding of animals, and said it was well-known that warmth was an equivalent for food.

Mr. JAMES was much pleased with what Mr. Karkeek had read respecting Mr. Davey's farm. He also had the pleasure of seeing that farm, and he was particularly struck with the small quantity of roots consumed by the bullocks, less than 100lbs. per day; and yet those bullocks were doing remarkably well, as well or better than any lot of

bullocks he had ever seen. Now bullocks of that sort or size in Cornwall, when feeding, consume generally about 1½ cwt. of roots daily; and if by Mr. Davey's plan about one-half the quantity could be saved, it would be a very important point. Mr. Davey's plan was a little more expensive in labour for preparing the food, but the saving in food would more than compensate for that. He then spoke of the improvement made in agriculture during the last twenty years, and contended that the agriculturists, generally speaking, had made as much advance as the manufacturers. But they should all endeavour to make further progress, and follow in the steps of such gentlemen as their worthy chairman, who were introducing new systems into agriculture, and would be able to say whether they were profitable or not.

Mr. LAWRY asked a question or two with regard to the draught of the ploughs, which had that day been tried by a dynamometer.

Mr. FAULL, of Treverva, said the turn-wrest ploughs averaged 4¼ cwt., and the single 4½ cwt. This he thought was owing to the skim coulters of the single ploughs not having been well worked. The single ploughs did not work so deep as the double ploughs; the width of the furrow was not taken.

Mr. W. TRETHERY thought if it had been, the single ploughs would have been found to have turned a wider furrow than the turn-wrest ploughs.

Mr. TRETHERY subsequently introduced the subject of manures by way of promoting a discussion on the use of superphosphate of lime, and advised the farmers not to employ it as a manure for corn crops; for although it undoubtedly was an excellent manure for turnips, he was satisfied it would not answer for wheat, barley, or oats. He alluded to some experiments made by the late Mr. Pusey which confirmed his opinion. He would suggest the use of nitrate of soda, mixed with common salt, in the proportion of 1½ cwt. each per acre, as a top-dressing for barley and oats, in

case the farmers wanted a substitute for guano, on account of the present increased price of that article.

Mr. KARKEEK perfectly coincided with Mr. Tretthewy in the advice he had given, and said that farmers might rely on the fact, that although superphosphate of lime was even now recommended as a manure for spring corn crops by dealers in that article, yet he could assure them it was almost valueless for that purpose when used by itself; but when mixed with Peruvian guano, in the proportion of 2 cwt. of Lawes's Superphosphate to 3 cwt. of guano, it would prove a valuable and very efficient manure. He had been in the habit of recommending this mixture for corn crops of every description for several years, and it had been used with great success by an immense number of farmers; and the invariable result was to produce a stiffer straw, a greater tillering, and a heavier ear, than could be produced by the same weight of guano used by itself. Alluding to the various superphosphates now offered to the public, he cautioned the farmers against purchasing any kind whatever, unless the amount of "soluble" phosphates was guaranteed. This he considered absolutely necessary to the farmer who looks upon the quality in artificial manure as the great security for a good crop of turnips. He said it had hitherto been the practice to attach a value to the insoluble phosphates of the superphosphates, which had been done much in error, particularly when the insoluble portion consists, as it most frequently does, of hard-ground coprolite, which was of little or no agricultural value. The farmer would therefore do well not to place any value on the insoluble phosphate, unless they have the assurance that this portion is in the form of bone. He also considered that good manufactured superphosphate should contain at least from 22 to 25 per cent. of soluble phosphate, which, with some 10 per cent. of insoluble phosphates in the form of bone, would prove a valuable manure for turnips.

This terminated the proceedings of an evening most agreeably and usefully spent.

## THE GUANO CRISIS.

We are just now at the very height of our guano difficulty. That is to say, this is the season—a most favourable season, too—when above all others we need it; and there is none to be had. One of our most respectable manure-dealers was, for the first time, on Saturday, directly refused. They could not even promise him any further supply. When people have gradually accustomed themselves to the matter-of-course use of anything, the unexpected want of it must be very severely felt. This is the case with the farmer. We want guano as a manure for our barley and oats, and as a top-dressing for our wheat. We have reckoned more or less on our customary allowance, and have consequently neglected proportionately, to provide any substitute. With ordinary care, as we begin to see now when it is too late, we might have fallen back upon our own resource; as it is, however, there is an extraordinary and altogether unprecedented run on such manufactured manures as contain the ingredients required—ammonia and phosphates especially. The makers and dealers are at their wits' end to answer the orders pouring in upon them, and go from one to the other anxiously seeking the material to fulfil them.

Each succeeding year turns up its peculiar subject for discussion. Last year it was agricultural statistics; this it is as assuredly the guano monopoly. Almost every one of our leading national societies have already touched upon it. The Farmers' Club, as we have shown, was the first to open the attack; and since then both the English and Scotch Agricultural Societies have given it a prominent place in their proceedings. A fortnight since, Mr. Evelyn Denison, as President of the Royal Agricultural Society of England, was de-

puted to confer with Lord Clarendon on the subject. We have yet, however, to learn what came of the interview. And only on Monday last a more numerous deputation from the Highland Society paid an official visit to Lord Stanley of Alderley. The object was of course to procure, if possible, a supply of guano from elsewhere; and the first point urged upon the attention of his lordship was the policy of obtaining possession of the Kooria Moorria Islands. These deposits, it will be remembered, have been brought into notice chiefly through the agency of Mr. Caird, who, a week since, at a general council Meeting of the English Society, dwelt at some length upon their value. The representatives of the Scotch agriculturist went on to ask for an exploring expedition; at the same time they warned the Government from sanctioning any further monopoly, as it seems to be the case with Captain Ord and the Arabian Guano. Still the principle of monopoly is broken through when once we can establish an opposition to it; and the possession of these Kooria Moorria islands might work us good in a variety of ways.

We believe such conferences as these to be all in the right direction—the first step to the attainment of what we seek. It is sheer absurdity to say we must not look too much, or depend much upon the Government here. On the contrary, this is just one of those cases that we must look to the Government; and, moreover, let them know that we depend upon them. Pray who is to help us, or to put such a trade as this upon a proper footing, if our own flag does not? Was it any other business—Manchester, Birmingham, or Sheffield—so interested, their leaders would never stay their exertions until

something was done. Neither must ours. The farmer has surely some friends in either House who will keep the question alive for him. But what did these Houses or the Government ever do for the farmer yet? the less sanguine may enquire. Little enough, perhaps. A sufficiently good reason for their doing more now they have the opportunity—and when they may do it, not merely without injury, but with manifest advantage to themselves and the community.

Still, let us repeat, the agriculturist may do much for himself. We give in another part of our magazine (see page 191) a lecture delivered by Professor Anderson, on Wednesday, before a full meeting of the Highland Society. The whole point of this paper is, as was the case at the London Club, that the farmer has not done enough for himself—that he has learnt to rely far too much upon the use of guano, when many other materials would often have served him as well or better. “*I feel convinced that guano has been frequently used when other manures would have produced an equally good result at a less cost.*” The whole lecture is very plain and practical, and must be proportionately effective. It will be observed, the Professor dwells on the now common charge against the farmer, the waste and abuse of his own home-made manure; while he hints at something more as likely soon to be a home-made article. The agriculturist is to be the manufacturer of his own superphosphate.

This leads us to another point of view, taken by a

gentleman, a communication from whom was read at this meeting. How is it, if the Professor and practice agree so well in this matter—how is it that people have come to such an indiscriminate application of guano, “when other manures would have produced an equally good result at a less cost”? Mr. Finnie himself helps us to the solution of his own query. The farmers have, as a rule, become afraid of other manures. They have so often been done; so often been caught with what was warranted cheap and good, that they have prudently refrained from pursuing so dangerous an experiment. With all their faults, the Messrs. Gibbs have preserved their characters, and given us the genuine article; while the best friends the Messrs. Gibbs ever had have been the adulterators. With all its puffing and quackery, there has been no time when people were more ready to pay a good price for a good article.

The thing, however, may be carried too far—just as it has been. We should have continued to submit quietly enough to Peruvian dominion, had there not, like Byron's Corsair, been

“No limit to their sway.”

As it is, we are already in open rebellion. We are fighting our cause, moreover, with every precedent in history to assure us that tyranny pushed to its extreme has been ever fatal to him who exercised it. Like a pig swimming, monopoly going too fast a-head will only end by cutting its own throat.

CALENDAR OF AGRICULTURE.

Sowing of grains must now go on rapidly; spring wheat, oats, barley, peas, beans, and vetches, so fast as the season and means will allow and can execute; flax and lucerne on well-prepared grounds, with 12 lbs. to 20 lbs. of seed to an acre, and sainfoin at 1½ cwt. to an acre, and dress with gypsum. Sow parsnips and carrots on rich well-prepared lands; drill at 18 inches distance on the flat ground, with seed steeped in lees of urine, or in a solution of nitrate of potass—one to six of water—and dry by encrusting with quicklime. Top-dress clovers and young wheats with applications of salt, rape-dust, malt combs, gypsum, and nitrate of soda; the latter at 1 to 2 cwt. on an acre. Sow cabbage seeds for summer plants; put light stock animals on watered meadows; set traps and spread mole-hills; bush-harrow, roll, and finish the dunging of grass lands.

The planting and cutting of timber of any kind must now be finished. Plant hops on dry lands, trenched, and well prepared; make hills six feet distant each way, which best admits the scarifier; place four sets in each pit—one in each corner—and cover lightly with earth.

Begin to cross-plough the lands intended for green-crop fallows; remove all turnips from the fields; and carry out dung in weather unfavourable for sowing.

Send the strong lambs to the natural and artificial grasses, and to the watered meadows. The ewes will now drop lambs very fast, and will claim much attention: feed amply with juicy food, swedes, beet-root, and cabbages, by being preserved for this most useful purpose.

The feeding of hogs for bacon will cease this month, and the foremost-fed bullocks may also be removed. Carry all dung to the manure heaps, and keep all houses clean. Set poultry on eggs for hatching, and exchange eggs with any neighbour; feed well, and attend to cleanliness, and provide good accommodation for the young broods: it is both pleasant and profitable to see a numerous and healthy flock of poultry on any farm.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO, (per ton, for 30 tons).....	£13 5 0	to	£10 0 0
Do. Do. ....(under 30 tons).....	14 15 0	to	15 0 0
BOLIVIAN GUANO .....	(none)	to	0 0 0

ARTIFICIAL MANURES, &c.

Nitrate Soda } (per ton).....	£19 10 0	to	£20 0 0	Sulph. of Copper or Roman Vitriol, for Wheat steeping.....	£ 42 0 0	s. d.	to	43 0 0
Nitrate Potash } or Saltpetre.....	29 0 0	to	30 0 0	Salt.....	1 5 0	to	2 0 0	
Sulph. Ammonia 18 0 0	18 10 0	Muriate ditto... 22 0 0	23 0 0	Bones, Dust, per qr. Do. ½ inch. Oil Vitriol, concentrated, per lb.....	1 5 0	to	1 6 0	
Superphosph. of Lime.....	6 0 0	0 0 0	Soda Ash, or Alkali.....	0 0 0	to	8 0 0	0 0 1	0 0 0
Gypsum.....	2 0 0	to	2 10 0	Do. Brown.....	0 0 0	to	0 0 0	
Coprolite.....	3 15 0	to	4 0 0					

OIL-CAKES.

Linseed-cakes, per ton—							
This American, } £11 5 0	to	£11 15 0	Marseilles..... £9 10 0	to	£10 0 0		
in bbls. or bags } English.....	11 0 0	to	11 10 0	Rape-cakes, per ton	7 0 0	to	7 10 0
Thick do. round	10 5 0	to	10 10 0				

JOHN KEEN, 35, Leadenhall-street, (Late Odams, Pickford, and Keen.)

Williams & Co., 24, Mark Lane—Azotic..... £6 10 0

Manufactured by Hodgson & Simpson, Wakefield, and Matthews & Co., Bradford.

Ammonia-Phosphate and Nitro-Phosphate.....	per ton	£8 0 0
Superphosphate of Lime.....	per ton	£7 0 0
Agricultural Chemical Works, Stowmarket, Suffolk.		
Prentice's Cereal Manure for Corn Crops.....	per ton	£8 10 0
Prentice's Turnip Manure.....	per ton	£7 0 0
Prentice's Superphosphate of Lime.....	per ton	£8 10 0
Lancashire Manure Company, Widnes, near Warrington.		
J. Knight & Co.'s Nitrogenized Bone Manure.....	per ton	£8 15 0
Manure Works, Givichill, Beverley.		
Tigar & Co.'s Celebrated Turnip Manures.....	per ton	£7 10 0

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND.		ATMOSPHERE.			WEATH.
1856-7.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Jan. 22	29.81	29.52	29	39	34	S. West	brisk	cloudy	cloudy	cloudy	rain
23	29.40	29.16	29	39	34	West	brisk	cloudy	cloudy	fine	rain
24	29.11	29.10	32	40	36	N., N. West	brisk	cloudy	cloudy	cloudy	rain
25	29.10	29.50	33	36	34.5	North	gentle	cloudy	cloudy	cloudy	rain
26	29.60	29.72	32	34	33	North	fresh	cloudy	cloudy	cloudy	snow
27	29.82	29.82	32	35	33.5	North	gentle	cloudy	cloudy	clear	dry
28	29.82	29.51	23	35	29	North	gentle	fine	sun	cloudy	dry
29	29.81	29.81	22	31	26.5	W. by N.	gentle	fine	fine	cloudy	snow
30	29.81	29.67	19	32	25.5	N. West	calm	fine	fine	cloudy	snow
31	29.60	29.60	31	35	33	Variable	calm	fine	fine	cloudy	melted
Feb. 1	29.67	29.88	17	33	25	Variable	calm	fine	variab.	fine	dry
2	29.55	29.57	25	36	30.5	S., S.E.	calm	cloudy	cloudy	cloudy	dry
3	29.70	29.94	25	32	28.5	N. East	calm	cloudy	cloudy	cloudy	dry
4	30.10	30.21	23	34	28.5	N. West	gentle	hazy	cloudy	cloudy	dry
5	30.14	29.95	19	35	27	S. East	gentle	hazy	cloudy	cloudy	dry
6	29.90	29.90	34	45	39.5	S. West	gentle	hazy	cloudy	cloudy	dry
7	29.81	29.74	40	42	41	Southerly	airy	cloudy	cloudy	cloudy	dry
8	29.70	29.65	34	42	38	S. Westerly	airy	cloudy	cloudy	cloudy	rain
9	29.64	29.51	35	48	41.5	South	airy	cloudy	cloudy	cloudy	dry
10	29.70	29.70	38	45	41.5	South	gentle	cloudy	cloudy	cloudy	dry
11	29.90	29.90	35	47	41	W. by N.	airy	fine	cloudy	cloudy	dry
12	30.30	30.30	32	47	39.5	W. by N.	airy	fine	fine	fine	dry
13	30.30	30.29	30	44	37	S. West	gentle	fine	cloudy	cloudy	dry
14	30.27	30.21	30	48	39	S. West	gentle	fine	sun	fine	dry
15	30.14	30.09	30	44	37	S. East	variab.	cloudy	sun	fine	dry
16	30.08	30.02	28	55	41.5	S. East	variab.	fine	sun	fine	dry
17	30.01	30.01	37	56	46.5	South	gentle	fine	cloudy	fine	dry
18	30.01	30.00	42	50	46	South	gentle	fine	foggy	fine	dry
19	30.10	30.14	40	46	43	N. West	gentle	fine	sun	fine	dry

ESTIMATED AVERAGES OF FEBRUARY.

Barometer.		Thermometer.		
Highest.	Lowest.	High.	Low.	Mean.
30.52	29.170	53	21	38

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
40.86	34.2	37.15

WEATHER AND PHENOMENA.

January 22. Evening rainy.—23. Scuds of snow and rain.—24. Raw and damp.—25. Rain, and snow melting.—26. Light snow all day.—27. Improved.—28. Keen, and sunny.—29 and 30. Snow and hoar frost.—31. Snow in the last night.

LUNATION.—New moon 25th, 11h. 26m. night.

[N.B. Beautiful occultation of Jupiter by the Moon on the second evening.]

February 1. Keen frosty night; smoke at sun-

set.—2. Chilly.—3 and 4. Rain, frost, and snow.—5. Changeable.—6. Frost gone, and snow melted.—7. and 8. Pretty fine.—9. Rain: first commenced at 9 p.m.—12 to 14. Fine.—15. Overcast.—16 and 17. Peculiarly mild.—18. Foggy.—19. Starry and smoky atmosphere.

LUNATIONS.—First quarter 1st, 8h. 20 m. afternoon. Full moon 8th, 7 m. before midnight. Last quarter 17th, 2 h. 19 m. morn.

REMARKS CONNECTED WITH AGRICULTURE.

Never were there stronger contrasts presented by the two months of the present year. In the first month I gauged no less than 3.139 inches of rain; on the 9th of February the fall amounted to 0.234 only. More may come, but of that we know nothing, and what have been the effects upon the land? As it is, the grass is much less verdant than it was in January.

JOHN TOWERS.

Croydon, Feb. 20.

## AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR  
FEBRUARY.

For all farm operations the weather, during nearly the whole of the month, has been very favourable. In its early part we had a fine fall of snow in nearly all parts of England, and which was productive of much benefit to the young wheats, respecting which our accounts generally are satisfactory. The continued decline in the value of wheat has, we find, induced many farmers to sow less of that grain than in 1855 and 1856, and to substitute barley wherever practicable. This, possibly, is the wisest course that could be adopted, seeing that there is every prospect of barley being relatively dearer than wheat during the greater portion of this year. Apparently, wheat is likely to recede in price below its present level from 5s. to 10s. per qr., from the fact that an unusually large portion of our last crop has turned out unfit for grinding purposes, without a large admixture of foreign; and that we have before us the prospect of an immense importation of food, wheat in particular. Again, the supplies of home and foreign wheat on hand are unquestionably large, and all parties immediately interested in the trade agree that we have seen the highest range in the quotations; hence extreme caution has been shown on the part of the millers in effecting purchases, and the sales of late have been wholly confined to immediate wants. Barley, however, has been in somewhat extensive demand, and large supplies have been taken for distilling purposes, to meet the numerous orders received from the Continent for what is termed "raw" spirit, which is now extensively used to "make up" both foreign wines and brandies. Still our impression is that forthcoming supplies of barley will be fully equal to our wants, because we find that immense quantities have been lately purchased in the north of Europe, and which will find their way here shortly after the re-opening of the navigation.

The doubts which were at one time entertained respecting the growth of potatoes last year are now fairly set at rest. It will be recollected that, during the autumn, it was boldly asserted by many parties that it was evident that at least two-thirds of the crop had been lost. We strongly opposed this opinion, although we admitted that disease was pretty general in the whole of our districts. We now find that potatoes are coming forward quite as abundantly as at any time in 1856; and our impression is that the total yield was quite equal to our wants, though somewhat deficient in quality. The consequence of this deficiency is that we have a very wide margin between the value of the best and the most inferior kinds, viz., fully 50s. per ton. The imports of foreign potatoes into London have amounted to about 600 tons, and nearly the same quantity has come to hand from Ireland.

Very large supplies of hay and straw have been on sale in excellent condition, and they have changed hands at low prices, or as follows: Meadow hay £2 10s. to £4 4s., clover do. £3 10s. to £5, and straw £1 4s. to £1 9s. per load. Within 30 miles of London the quantities on hand are very extensive, and those in other quarters are heavy. Unless, therefore, we should have a short growth this year, prices are likely to rule low for some time. The enormous quan-

ties daily received by water-carriage have greatly interfered with the usual course of the trade.

The wool trade has continued in a most excited state, arising from the enormous demand, and the decreased importations from Australia. The demand for woollen goods, both for home use and export, has been extensive, and it is likely to continue so for some time. Wool is, therefore, likely to be very dear for a considerable time, and our impression is that the home-growers would act wisely in not forcing their produce for sale. Our latest Australian advices show higher rates; but they state that the present season's shipments will be on a more extensive scale than in 1856. We shall, too, receive additional supplies from the Cape and Russia, but they will all be required either here or on the Continent, stocks everywhere being reduced to a very narrow compass. The present public sales are going off briskly, at enhanced quotations.

The cattle trade has been in a most buoyant state, and sheep have sold at unusually high prices, owing to the limited supplies at hand. From the continent the arrivals generally have been very limited.

In Ireland and Scotland, agricultural matters have been in a satisfactory state, yet wheat has continued to fall in price. The shipments of grain from Ireland have been on a very moderate scale, but those from Scotland have steadily increased. This may, in some measure, be attributed to the large quantities of flour and wheat which have from time to time been imported from the United States, and which have materially assisted to meet consumption. The wheat, barley, and oats recently received into London from Scotland have been in good saleable condition.

REVIEW OF THE CATTLE TRADE DURING  
THE PAST MONTH.

Although we hear of no deficiency in our leading grazing districts, unusually short supplies of sheep have been received in the metropolis during the whole of the month. We may observe, however, that they have come to hand in very prime condition, and, for the most part, have carried a large amount of internal fat. The deficiency in the receipts of live animals for consumption in London has been partly made good by the increased arrivals of dead meat up to Newgate and Leadenhall, both from Scotland and various parts of England. This change in the mode in which the trade is met may be chiefly attributed to the unusually high value of fat, skins, and wool, in the provinces, and to the great wants of the manufacturers, who have purchased large supplies of offal in the country in preference to dealing more extensively in the London market, where the best skins have realized as much as 13s. each. The tallow melters, too, have been compelled to pay 3s. 7d. per 8 lbs. for rough fat; this quotation, however, is not maintained, as the last price in the official return was 3s. 2d. per 8 lbs.

The imports of beasts from the continent have been very moderate, owing to the severity of the weather; but the supplies of home-fed stock have been moderately extensive and in admirable condition. The bullock trade has been by no means active, and a fall of 2d. per 8 lbs. has taken place in prices; but sheep have sold as high as 6d. per 8 lbs.,

and both calves and pigs have realized extreme rates. The present high value of stock has led to much discussion in reference to the future state of the trade. Some of the graziers contend that prices generally will go much higher than they now are, and that the available supplies are unusually small. We, however, are of a different opinion, and we must not lose sight of the fact that high quotations invariably lead to a diminished consumption of food; besides, present prices are sufficiently tempting to induce the foreigner to send every head of stock he can possibly spare for us, as ours is now the dearest market in Europe. There is only one feature which is likely to prevent our being over-supplied with beasts and sheep, viz., the steady demand which continues in Holland on French account. In the event of that demand falling off—which will most probably be the case in the event of the harvest in France this year turning out an abundant one—we shall receive additional supplies from the continent, and which will have the effect of reducing our quotations. Notwithstanding the enormous consumption going on, it would be folly to calculate upon present prices of sheep being exceeded or even maintained during the remainder of the year, because our graziers must be prepared to compete not only with the Dutch, but likewise the Irish breeders, the latter of whom will shortly commence sending to London from 2,000 to 3,000 head of sheep every week.

Some excitement has been caused by the arrival of intelligence from Russia to the effect that great mortality exists amongst the breeds of beasts in that country, and which has caused some enormous losses. This news had led to the impression that ere long it will be brought into this country, and numerous suggestions have been made to prevent its arrival. To allay this impression, we may state that we do not import stock from any part of Germany; Holland, Belgium, Sweden, Denmark, and Spain being our sole contributors; and that all stock, on arrival in this country undergoes a careful inspection by competent parties prior to being landed. Besides, foreign stock is almost immediately slaughtered for consumption, and not mixed with our native breeds; except, indeed, in the markets in which it is exposed for sale: still, too much caution cannot be shown in the matter, and we advise all those who have endeavoured to fatten foreign stock in this country to abandon a speculation of this nature, because hitherto it has turned out a complete failure, and only resulted in the sacrifice of capital.

The health of the stock continues good, and the supplies of food on hand are considerably larger than during the last two years. Hay and straw are now fully 30 per cent lower in price than they were at the commencement of 1856.

The imports of foreign stock into London during the month have been as under:—

Beasts.....	2,260 head.
Sheep.....	1,435 „
Calves.....	1,005 „
Total.....	4,720

Same time in 1856.....	3,087 head.
„ 1855.....	2,839 „
„ 1854.....	10,663 „
„ 1853.....	12,433 „
„ 1852.....	9,123 „
„ 1851.....	11,626 „

Two or three cargoes of oxen have come to hand from Spain, but the prices realized for them have not given a large margin of profit.

The total supplies of stock shown in the Great Metropolitan Market have been:

Beasts.....	17,629 head.
Cows.....	457 „
Sheep.....	74,430 „
Calves.....	1,172 „
Pigs.....	1,975 „

COMPARISON OF SUPPLIES.

Feb.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1856....	19,642	495	99,950	673	2,614
1855....	17,436	385	91,180	596	2,705
1854....	20,091	520	92,441	1,023	2,279
1853....	19,303	470	86,910	2,096	2,420

Thus, it will be seen that fewer sheep have been shown during the month just concluded than in any corresponding period since 1852.

About 12,000 Scots and short-horns have been received from Norfolk, Suffolk, Essex, and Cambridgeshire, 2,900 from other parts of England, 1490 from Scotland, and 500 from Ireland. Scarcely any sheep have come to hand out of the wool, and shearing generally appears to have been commenced later than in most previous seasons. This is a wise measure on the part of the flockmasters, because we have frequently seen sheep sold out of the wool at a much less price than those not shorn, many of the butchers refusing to purchase what they called “chilled mutton.” Besides, at present the grazier need not be over-anxious to sell his wool immediately, as there is every reasonable prospect of prices going from 1d. to 2d. per lb. above present quotations.

Beef has sold at from 3s. 4d. to 5s.; mutton, 4s. to 6s.; veal, 4s. to 5s. 6d.; and pork, 3s. 6d. to 5s. 2d. per 8 lbs., to sink the offal.

Full average supplies of meat have been on offer in Newgate and Leadenhall. The general demand has ruled very firm as follows:—Beef, from 3s. 1d. to 4s. 6d.; mutton, 3s. 6d. to 5s.; veal, 4s. to 5s.; pork, 3s. 6d. to 5s. 4d. per 8 lbs., by the carcase.

NORTH NORTHUMBERLAND.

Since Christmas morning, when we dated our last report from this district, we have not ventured to put pen to paper, in allusion to the rural aspect of our northern county. In fact, the closing week of the old year so closely approximated to what we afterwards experienced during the first month of 1857 that it was words of no importance to tell our brethren what every one experienced—“unsettled, stormy weather.” And for the first ten days of the present month little could be done on the farm, except dodging with manure cart, and attending to live stock. Looking back to the last four months we barely recollect a period, during the last half-century, of equal duration without a week of dry or hardening weather. Such has been our lot. Grain of all description, harvested and carried home in poor condition, has made little improvement in the stack, and, as thrashed, the yield middling, quality wretched; brought to market, and selling at prices that will “tell tales” where the money payments cannot be made out of the feeding fold. So far as the season has advanced, a corn farm will leave a small balance for rent. Here our case is not isolated: taking the British Isle from the Humber to the most northerly point of Scotland by the central ridge of the mountain range, the entire fertile vales, where even the rivers or brooks flow to the German Ocean, the visitation seems nearly on a parallel: when we see the *pet* markets in East Lothian famed for grain of first-rate quality reported the second week in February, “wheat 51 to 54lbs. per imperial bushel, prices 24s. to 29s. per qr.,” little more can be advanced. Nor do we quote to excite speculation or alarm. Such has been the will of divine Providence; and we doubt not, like a frost to “check a too early growth in spring,” will have a salutary effect in due time. Taking a bird’s-eye view of this northern county generally, field labour on dry situations may be set down at about a medium state of forwardness; wet, clayey districts quite the reverse; and, where turnips have not been stored, but drawn from the field for daily supply, the plunging and poaching of the soil is almost indescribable. Since the first week in November very little wheat has been sown with any chance for a successful result, until the present week. Since the 12th inst., up to this morning, the weather has been generally favourable, and a fair breadth of spring wheat sowed on forward



dry soils: this morning we have dense, damp fog, which will stop operations. Over this wheat-producing district the average will fall short of medium breadth, and fully a fourth or fifth less than for the last two years. Sheep have, so far, made a poor grazing season on the turnip-break: seldom a clean bite or a dry lair, leaving the field in a state of puddle. Hence, as anticipated, prime mutton is at a premium in the market. The bovine tribe have fared better where good homesteads are the rule, and very prime bullocks and heifers are coming out for the flesher; and, with a fair average number housed for feeding in autumn, we trust the city aldermen may depend on the grazier for a good sirloin of beef. Sheep may form the exception for a time; but, with genial weather and the many artificial resources for fattening, a better supply will come out. Little has been said about the potato recently: from one-third to one-fourth was lost or spoiled before lifting from the field. Where the residue were well selected and stored, they have kept good; and we hope a full supply will be saved for culinary and seedling purpose. The price of the article has advanced in the market during the last month. Quoting the words of your correspondent last week, "the farmer lives in hope"—we deem, fully alive to the maxim; draining goes ahead on all sides, and the demand for labour is quite equal to supply. No able or willing man stands idle.—Feb. 20.

### AGRICULTURAL INTELLIGENCE, FAIRS, &c.

**BANBURY FAIR.**—Business generally seems brisk, the attendance of buyers being very numerous. The supply of fat beasts was good, and they sold at rather lower prices, viz., from 4s. 4d. to 4s. 8d. per 8lbs. Store cattle were an abundant supply, and good things fetched high prices; but the holders of inferior beasts seeming more inclined to decline selling than to take reduced prices, the trade in this kind of stock was dull. The supply of sheep was remarkably small, and a few clipped sheep on sale in the fair. The attendance of buyers was very numerous, and consequently the sheep sold at enhanced prices; fat sheep at from 5s. to 5s. 6d., and shorn sheep from 4s. 4d. to 4s. 6d. per 8lbs. The pig fair was an average supply, and they sold at an advance on last month's prices.

**BEDALE FORTNIGHT FAIR.**—We had a small supply of stock, which had brisk demand. Mutton and beef were a trifle higher than last market. Beef 7s. to 8s. per stone, mutton 7d. to 8½d. per lb.

**BEVERLEY HORSE FAIR** has had a limited supply of animals. The best descriptions were readily sold.

**BINGHAM HORSE SHOW** was well attended this year. Some very valuable animals changed hands, but inferior kinds met rather a dull sale. On the whole, we have not had so large a gathering of buyers and sellers for some years past.

**CASTLE-DOUGLAS HORSE FAIR**—The attendance was large, but not so numerous as we have seen it at this season. The show of horses was limited and meagre enough. Yet there were some few good horses, and for these there was a good demand, and prices, if anything, higher than on any former occasion. For example, "gozlers" of creatures, year-and-a-half old only, and scarcely yet knowing how to ambulate with four legs, were readily sold at £30 to £35. No doubt this is with a view of keeping the animal for a year or two, giving it some easy work to begin with, and two years hence selling it for £50 to £60. This will pay. Full grown draught horses were sold from £50 to £60. A three-year-old fetched £50, and *no luck-penny*. £60 was offered for a carriage-horse bred in this neighbourhood, and refused, the lowest price of the owner being £70. Of course, horses could be got at any price; but for really good and servicable animals the fair has fully sustained, if it has not exceeded, the prices of horses in the S-wartry for many years past.—**ANOTHER ACCOUNT:** The show of horses was far from being either large or good, dealers having all the best animals picked up weeks ago. Prices, however, were high, and many good draught animals sold from £50 to £60. Indeed anything having quality and youth, for either harness or plough, was readily disposed of; while aged, unsound, and inferior animals, as is always the case, were a drug in the market.

**CHIPPENHAM GREAT MONTHLY MARKET** was well supplied with cheese of all descriptions, for which there was a brisk demand, especially for good broad, which, for the time of year, was more than we expected to see. Lost-cheese was not quite so eagerly sought for; consequently, in that department the trade ruled dull. The prices were as under: about 200 to 3s pitched. Broad doubles 50s. to 65s., prime Cheddar 60s. to 74s., twin 50s. to 57s., loaves 60s. to 72s., skim 24s. to 28s. per cwt.

**DEVIZES FAIR.**—There was a larger supply of cattle, and a fuller attendance, than for many years past. Poor oxen were in great numbers, and sold readily from £18 to £26 each. Grazing heifers fetched from £12 to £18 each; and in-calf heifers, of which the supply was very limited, brought from £14 to £20 a head. There was no beef in the fair; and the horses, as usual, were of anything but first-rate character.

**DOBBOOK CATTLE MARKET.**—A tolerably good supply of all descriptions of cattle, the whole of which met with a brisk demand with an upward tendency. Fat bullocks from 55s. to 60s. per score, Sheep 7½d. to 8d. per lb. Cows and Calves without any alteration in value.

**DORCHESTER FAIR.**—The show of beasts was unusually large, and sales were brisk, notwithstanding which, however, prices ruled high. Cows with calf ranged from £12 to £16, barreners from £8 to £14; fat beasts, per score, prime quality 12s., inferior do. 10s. The supply of sheep was small, and sales effected at from 30s. to 40s. Pork averaged 10s. per score. There was a capital show of young cart-horses, which fetched high prices.

**EXETER FAIR.**—The supply of cattle exhibited for sale was moderate. The best fat beef fetched from 10s. 6d. to 11s., and inferior 10s. to 10s. 6d.; barreners 6s. to 7s. per score. Best working oxen £30 to £40, steers £25 to £35 per pair. Cows and calves £11 to £18, and in some instances £20. There were no ewes on offer, and only about 30 wethers, which were sold at 8d. per lb.

**GLOUCESTER MONTHLY MARKET** was well supplied with both cattle and sheep, and the demand was equal to the supply. Good beef sold readily, and mutton fully supported former prices. The market was soon cleared at the following terms: Beef, 6½d. to 7d. per lb.; mutton, 7½d. to 8d.; pigs, 10s. to 10s. 6d. per score.

**NORTHAMPTON FAIR.**—There was a fair number of fat beasts, which made 4s. 6d. to 4s. 8d. per 8lbs. Mutton was very dear, making for nice small sheep full 5s. 6d. per 8lbs. The high price of wool materially influences the value of all kinds of sheep. There was a good sprinkling of store beasts, for which dealers asked very high prices. Not a great many tegs, but the prices sought were extravagantly high. There were about the usual number of horses in the fair, and anything sound and useful readily sold at high figures.

**SHREWSBURY FORTNIGHTLY FAIR.**—The best heifer beef sold readily at 6½d. per lb.; useful stores and good cows and calves sold well; fat calves 6½d.; wether sheep from 8d. to 9.; couples of ewes and lambs 45s. and upwards; fat pigs 6d. to 6½d.; store pigs very high.

**SOUTHMOLTON GREAT MARKET.**—Fat bullocks were scarce, and from 10s. 6d. to 11s. per score; steers from £12 to £15 each, and were not plentiful; stores £10 to £14 each. The cows and calves were very dear, and scarce; they ranged from £12 to £15. Fine bullocks 7s. to 9s. per score.

**ST. COLUMB CATTLE MARKET.**—There was a good supply of fat bullocks, for which there was a good sale; price from £3 to £3 3s. per cwt. There were not many fat sheep; most of those in the market were soon disposed of; prices from 7½d. to 8d. per lb. There was a good attendance of dealers.

**TADCASTER FORTNIGHTLY MARKET.**—We had a fair supply of stock. Beef 7s. 3d. to 8s., pork pigs 7s. 6d. per st.; mutton 7½d. to 8d., veal 7½d. per lb.

**WINSTER FAIR.**—The supply of animals was good, and all descriptions of stock commanded good prices. Heifers and calving cows from £12 to £20; barren cows and heifers from £10 to £15. Horses not so many as usual; Mr. Allsop, of Tiercer, sold some at £30, and all were sold off before noon.

**YORK FORTNIGHTLY MARKET.**—Calving cows were in rather greater supply than demand, at lower rates. Lean beasts were in moderate supply and demand, at prices in favour of grazing. Fat beasts were equal to the wants, at 7s. to 8s. per stone. Grazing sheep 32s. to 50s. per head. Trade generally was dull.

## REVIEW OF THE CORN TRADE. DURING THE PAST MONTH.

The mildness of January, closing with a sharp frost, has been followed by an unusually propitious February, scarcely any rain having fallen since the light covering of snow; and though much fog has prevailed in the mornings, the close of the month has been clear and brilliant, affording fine opportunities for working the land and getting forward with the sowing of spring wheat and Lent corn throughout the country south of the Humber. But there are still complaints of backwardness in the North, and neither the frosts nor winds have been sharp enough, or sufficiently long-continued, to produce any improvement in the samples of wheat brought to market; the superficial damp having further increased the difficulty of selling, and reduced the averages fully 2s. per qr., while the price of fine dry qualities has scarcely varied from the commencement of the month to its close. As compared with last year at the same season, a reduction of about one pound per qr. appears in wheat prices; but it scarcely seems probable that lower rates are yet in prospect, though the extraordinary influx of American produce has placed some quantity in store, by which millers are rendered comparatively independent of short supplies at the principal shipping ports. The great deficiency, however, in Scotland and the North of England in qualities fit for milling purposes, and the larger sales now making in the South, upon at most but an average yield, with a constant drain for France and Spain upon foreign arrivals and our own produce, with the check given to the United States shipments by the state of trade this side the Atlantic, we think must ultimately tell, especially should the present auspicious seed-time be succeeded by any unpromising appearances in the young wheat. It is already commencing its spring growth; the forward pieces appear unharmed by the fluctuations of temperature through which they have passed, and the late sowings are reported to come up with a very even and satisfactory appearance. The weather having been extremely rigorous in America, some reports of injury have already been reported there, but we hope to no serious amount, as no old stores of former years are to be found in any corn-producing country; and the successful gathering of the future harvest is of unusual importance to the world. In Spain, successive droughts have left them so bare, and sent prices so high, that it is almost surprising there is no political ferment. At Seville, 109s. 6d. per qr. is still paid for wheat;

at Madrid prices range from 94s. to 107s., with barley to 59s. As a palliative, the Government has ordered that cargoes in the shipping ports shall be sold at reduced rates, viz., at 68s. for soft wheat; but for hard qualities, which are chiefly used, the price is to be 87s. 6d. to 90s. per qr. At Lisbon, with good arrivals and a heavy state of trade, prices were 76s. 6d. to 93s. 6d. per qr. If we were to judge of the wants of France by the state of the Paris market, we should come to the conclusion that a few shipments there would have a material effect; but it must be remembered that Paris has equable supplies, and that these supplies, like our own, are mostly inferior in quality and condition, and that the spirit of speculation is actually prostrated by Government interference. The enormous arrivals at Marseilles, which only produce a transient calm at that place, and the incessant orders on Germany, in the Danube, the Black Sea, Egypt, America, and here, show really the state of the case, whether originating in Government or private enterprise. Sweden, too, as well as Norway and Finland, have indifferent harvests; and this circumstance will be calculated to reduce the usual Baltic supplies in the coming season, which will almost exclusively consist of new and inferior produce. At Hambro', where they write as independent of British trade, the price on the spot for wheat was about 57s. 6d. At Dantzic, it ranged from 40s. to 58s. 3d., at Stettin 43s. 3d. to 49s. At Stockholm the top price was 72s. 6d. At Petersburg the rates were 58s. to 61s. At Odessa, soft wheat was about 54s. Egypt itself is now confidently reported to have a deficient crop, which must affect the Mediterranean markets that depend on it, though shipments as yet have been ample in wheat. At Alexandria quotations were 37s. 9d. to 41s. 9d. per qr. American rates leave no margin for a profit; the best white Canadian at New York was worth 61s. 9d., and red 51s. 6d. per qr. Belgium and Holland are higher than England.

The first London market opened on very moderate supplies; the morning's show of samples from the near counties exhibiting some improvement, from the transient frost. The market at first had a lively look, being influenced both by the dry weather and country reports; but no advance in price whatever could be obtained, and the day eventually closed with little business.

The markets in the country were mostly cheer-

ful in their advices, with some improvement; but a thaw and damp weather returning, a downward tendency was noted by some, and Wakefield quoted 1s. to 2s. less money. Liverpool throughout the week remained unaltered.

On the second Monday the foreign supply was only 630 quarters, with exports of 5,712 qrs.; and only a moderate quantity of English, both for the week and as the morning's contribution. Whatever improvement had been previously observable was then evidently lost, a further deterioration being generally remarked, inasmuch that the retail trade then obtained was chiefly for foreign samples, for mixing: prices remaining as before.

The change in the weather equally affected the country, and all appearances of improvement; the prevailing reports describing prices the same; but Birmingham, Spalding, and Gloucester quoted 1s. per qr. decline; Boston made it 1s. to 2s., and Sleaford lowered rates 2s. to 3s. per qr. Liverpool was equally influenced to a fall, reaching in the course of the week to fully 2d. to 3d. per 70lbs.

Scotland and Ireland were comparatively unchanged.

The third Monday again showed limited arrivals, the foreign being mostly from India, from whence 3,000 qrs. were received. The morning's samples were equally scanty, and mostly inferior, so that none but the few dry samples appearing brought previous rates, foreign being firm, but with a slow trade.

Scarcely any change throughout the entire week was noted by any of the country markets, but Liverpool was cheaper 1d. to 2d. per 70lbs., with a moderate trade.

The fourth Monday was but an echo of the three preceding, both as to supplies and business, though there was hardly so much heaviness in sales, there being a plentiful attendance from the country, occasioned, it would appear, from the continued dull reports from the metropolis; but the amount of trade was below expectation, and chiefly confined to granaried foreign samples, which maintained their prices both for home consumption and export. The London averages, in the midst of these equal advices, show a decline of no less than 6s. 4d. in the course of four weeks, commencing at 62s. 10d. and ending with 56s. 6d.; this is chiefly attributable to the increased deterioration of samples, and difficulty of quitting such, unless at reduced prices, though the finest samples have doubtless participated insensibly in the fall; but foreign has given way very little, excepting for American where pressed.

The general averages, where the fall of some markets has been balanced by the rise of others, show but a slight difference in the same time, com-

mencing at 58s. 10d. and closing at 56s. 5d., difference only 2s. 5d. per qr.

The arrivals in Great Britain for the four weeks have been only 234,635 qrs., against 434,158 qrs. in the previous four weeks.

The foreign arrivals into London for February were scarcely one-eighth of the January supply, being in toto only 7,873 qrs.; the English, too, have fallen off about 5,000 qrs., being but 18,970 qrs. On the other hand, deliveries in the country have steadily increased, much exceeding those of last year, and showing that in dull times consumption is actively going on with inferior produce.

The flour trade, like that in wheat, has been very heavy, with prices somewhat reduced. The supplies from the country have been more free, but those from America considerably less. The arrivals in London for the last four weeks have been, 71,736 sacks and 39,897 brls. of country, with 237 sacks of foreign. The first Monday commenced with good supplies both of foreign and English, the latter then receded 2s. per sack, and the former were dull. On the second Monday, Norfolks recovered 1s. per sack of the previous depression, but town millers determined to reduce their rates by 3s. per sack, leaving the top price 57s., where it has since rested. The only difference in the last two weeks was, that Norfolks lost 1s. on the third Monday, and regained it on the fourth, leaving the price 41s. per sack. American closed very dull for the best, at 33s. to 34s. per brl.

Barley, throughout the month, has hardly varied in price—its comparative scarcity keeping up its relatively high value. Very little fine malting has appeared in town—maltsters and brewers anticipating the arrival by previous purchases. Such quality has been therefore held at 49s. to 50s. per qr., closing with greater firmness than at the commencement of the month. The tendency has always been downwards on large foreign supplies; but these having fallen to one-half, as compared with January last, and there being less of home-growth, prices were better sustained, even for second-rate and grinding sorts at the month's end. The foreign London receipts in four weeks were only 17,693 qrs., the English 16,104, leaving the average weekly supply only 8,450 qrs. Maize having been required for export, has been less in competition, and this has served to sustain the value of grinding sorts, while the inquiry for seed has made the first quality more in request. Prices, however, being still very high, we trust our agricultural friends will not allow the season to pass without quitting their stock.

Malt has been a slow sale all through the month, and sold rather in favour of buyers, with scarcely any quotable change of prices.

So inconsiderable has been the supply of oats through the month, that it is a matter of surprise the market should have been so dull, and on the whole about 6d. per qr. lower, which reduction was only quoted in the second Monday, there being no change before or since. It is therefore evident that the gluts of autumn sent so many to granary, that they have since served to make up all deficiencies on shipboard, and that the storing has been a losing concern, which it generally is on this low-priced grain. Some of the stands have lately been almost exclusively furnished with granary samples and many very inferior and out of condition, apparently gaining nothing in quality as well as price. The deficient growth in Ireland, however, must eventually be felt; and though Holland and some provinces in the Baltic had a good crop, it is doubtful whether stocks will not be worked very low before Archangel shipments come in, so that we can hardly expect a reduction on present prices without occasional gluts in bad condition. The London supply for all February, which in times of good business would not be thought very heavy in one week, were, in all, 57,058 qrs., consisting of 7,960 qrs. English, 4,399 qrs. Scotch, 17,440 Irish, and 27,259 qrs. from the continent—making a weekly average of only 14,265 qrs., which is nearly 3,000 qrs. per week below January.

As respects beans, the supply of English has been good, but principally new, and these on the second Monday gave way 1s. per qr.—no change being noted in old English or Egyptian qualities. The supplies have been of home-growth 5,048 qrs., of foreign 6,396 qrs.—giving a weekly average of 2,861 qrs. This grain being relatively cheap, and Egypt having but a poor crop, whence the principal supplies come, there seems no probability of a fall in value.

The total quantity of peas received in London through the month has been only 1,490 qrs., exclusively English. Prices throughout have continued low and unvaried; white boilers remaining quite a drug, must be destined now for feeding purposes—those early shipped from Canada still hanging on hand in granary. Maples and dun have sold better, but not at more money.

Linseed rose about 3s. per qr. in the first two Mondays; but its great price, after successive advances, appear for the following Mondays to have checked sales, though the sources of supply keep up rates, and we think the article must again be eventually dearer.

The seed season having set in, there has been a good demand for cloverseed and trefoil: red samples of the former not being very plentifully supplied from abroad, prices have advanced 4s. to 5s. per cwt. American being finest this season, has

been most sought after, and commanded 76s. per cwt.: Bordeaux, 72s. White has also maintained its value. Good trefoil has been fetching 33s. to 34s. per cwt. Tares have improved—small foreign being held at 40s. to 42s. Canary has been declining, and good seed may be had at 70s. per cwt. Hempseed also dull; but mustardseed, being in small compass, commands quite as much money. Carraway, coriander, &c., much as last quoted.

CURRENCY PER IMPERIAL MEASURE  
IN MARK LANE.

	Shillings per Quarter.
WHEAT, Essex and Kent, white, new...	50 to 60 extra 63 to 68
Ditto, red, .....	49 56 58 60
Norfolk, Linc. and Yorks., red, new..	48 56 58 60
BARLEY, new, malting .....	37 to 40..... Chevalier.... 42 49
Distilling .....	36 38..... Grinding.... 30 32
MALT, Essex, Norfolk, and Suffolk.....	66 71 .....
Kingston, Ware, and town made.....	68 72 .....
Brown .....	62 63 .....
RYE .....	— 30 40
OATS, English, feed .....	24 25..... Potato..... 25 32
Scotch, feed .....	26 30..... Potato..... 27 33
Irish, feed, white .....	21 25 fine 25 29
Ditto, black .....	20 23 .....
BEANS, Mazagan, new .....	31 33..... Ticks, new.. 32 35
Harrow .....	34 36..... Pigeon..... 38 41
PEAS, white boilers .....	39 42..... Maple .. 39 40..... Grey 37 38
FLOUR, per sack of 280lbs., Town, Households, ..	53s., fine 54 57
Country .....	41 42..... Households.. 45 47
Norfolk and Suffolk, ex-ship .....	40 41

FOREIGN GRAIN.

	Shillings per Quarter.
WHEAT, Dantzic, mixed, ..	72 75 high do. — 78 extra — 82
Konigsberg .....	71 75 .....
Rostock .....	62 74 fine..... — 76 — 82
American, white .....	62 68 red..... — 58 63
Pomera, Meckbg., & Uckermark, red ..	59 73 71 73
Silesian, red .....	64 69 white .....
Danish and Holstein .....	58 63 61 68
St. Petersburg and Riga.....	52 58 fine ..58 66
Rhine and Belgium.....	— — — —
Russian, hard .....	56 70 .....
BARLEY, grinding .....	26 32 .....
OATS, Dutch, brew, and Polands, ..	24 30 Feed..... 20 25
Danish and Swedish, feed, ..	24 29 Stralsund... 25 27
Russian .....	23 25
BEANS, Friesland and Holstein .....	37 40
Konigsberg .....	37 42 Egyptian... 35 36
PEAS, feeding .....	37 38 fine boilers.. 39 41
INDIAN CORN, white.....	36 40 yellow..... 37 40
FLOUR, per sack .....	French — Spanish — —
American, per barrel, sour.....	24 26 sweet..... 30 34

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Jan. 10, 1857 .....	58 10	44 7	23 8	38 5	41 7	39 9
Jan. 17, 1857 .....	59 4	45 7	23 4	40 2	40 5	39 6
Jan. 24, 1857 .....	58 10	46 1	23 8	37 8	40 8	39 6
Jan. 31, 1857 .....	57 11	46 5	23 4	38 1	40 5	39 7
Feb. 7, 1857 .....	56 6	45 9	23 0	39 3	39 6	38 10
Feb. 14, 1857 .....	56 5	44 11	23 6	44 4	39 6	39 7
Aggregate average .....	58 0	45 7	23 5	39 8	40 4	39 6
Same time last year .....	75 1	37 11	25 4	52 9	44 8	43 5

COMPARATIVE AVERAGES—1857-56.

From last Friday's Gaz.	s. d.	From Gazette of 1856.	s. d.
Wheat.....	100,952 qrs., 56 5	Wheat.....	87,591 qrs., 71 7
Barley.....	71,957 .. 44 11	Barley.....	94,879 .. 37 2
Oats.....	17,662 .. 23 6	Oats.....	20,709 .. 23 10
Rye.....	28 .. 44 4	Rye.....	25 .. 50 4
Beans.....	6,571 .. 39 6	Beans.....	5,882 .. 42 7
Peas.....	1,749 .. 39 7	Peas.....	1,874 .. 41 6

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	Jan. 10.	Jan. 17.	Jan. 24.	Jan. 31.	Feb. 7.	Feb. 14.
59s. 4d.	..	..	..	..	..	..
58s. 1d.	..	..	..	..	..	..
57s. 11d.	..	..	..	..	..	..
56s. 6d.	..	..	..	..	..	..
55s. 5d.	..	..	..	..	..	..

MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF JANUARY, 1857.

Species of Corn, Grain, Meal, and Flour.	Imported from Foreign Countries.		Imported from British Possessions out of Europe.		Total.	
	qrs.	bush.	qrs.	bush.		
Wheat	3207	2 7	11008	5	33240 4	
Barley	132808	3	..	..	132808 3	
Oats	57935	5	428	0	58363 5	
Rye	5323	7	..	..	5323 7	
Peas	13028	6	93	3	13125 1	
Beans	25161	3	..	..	25161 3	
Maize or Indian Corn	47382	1	..	..	47382 1	
Buck Wheat	0	7	..	..	0 7	
Beer or Bigg	360	0	..	..	360 0	
<b>Total of Corn and Grain</b>	<b>601493</b>	<b>7</b>	<b>12433</b>	<b>0</b>	<b>613926</b>	
	<b>cwts.</b>	<b>qr. lb.</b>	<b>cwts.</b>	<b>qr. lb.</b>	<b>cwts.</b>	<b>qr. lb.</b>
Wheat Meal and Flour	32959	2 0	185	2 11	33145	0 11
Barley Meal	..	..	..	..	..	..
Oat Meal	..	..	..	..	..	..
Rye Meal	12	1 19	..	..	12	1 19
Pea Meal	..	..	..	..	..	..
Indian Meal	17	2 12	..	..	17	2 12
Buck Wheat Meal	12	0 12	..	..	12	0 12
<b>Total of Meal and Flour</b>	<b>33301</b>	<b>2 15</b>	<b>185</b>	<b>2 11</b>	<b>333187</b>	<b>0 26</b>

PRICES OF SEEDS.

BRITISH SEEDS.

CLOVERSEED, red, per cwt.	50s. to 84s.
Ditto white "	60s. to 84s.
TREFOIL, per cwt.	25s. to 34s.
TARES, per bushel	5s. 0d. to 6s. 0d.
HEMPSEED (none)	—s. to —s.
CORIANDEK, per cwt.	20s. to 24s.
CARRAWAY, per cwt., new	—s. to 50s., old —s. to —s.
CANARY, per qr.	70s. to 72s.
LINSEED, per qr., sowing	—s. to —s., crushing 71s. to 73s.
LINSEED CAKES, per ton	£11 0s. to £11 10s.
RAPESEED, per qr., new	86s. to 88s.
RAPE CAKE, per ton	£5 0s. to £5 10s.

FOREIGN SEEDS. &c.

CLOVERSEED, red, French 68s. to 72s.	American.. 72s. to 76s.
Ditto white	60s. to 80s.
TARES, per bushel, new	5s. 0d. to 5s. 6d.
HEMPSEED, small, per qr.	—s. to 42s., Do. Dutch 44s.
CORIANDEK, per cwt.	15s. to 20s.
CARRAWAY "	42s. to 46s.
LINSEED, per qr., Baltic	67s. to 70s., Bombay 71s. to 72s.
LINSEED CAKE, per ton	£11 0s. to £11 10s.
RAPESEED, Dutch	76s. to 80s.
RAPE CAKE, per ton	£5 0s. to £5 10s.

HOP MARKET.

BOROUGH, MONDAY, Feb. 23.—We have no material alteration to notice in our market since our last report; the trade continues moderately active, and prices on the whole firm at the currency of last week. HART & WILSON.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, Feb. 23.—During the past week the arrivals coastwise and by rail have been far greater than any week this season, which, coupled with remarkably fine weather for the time of year, has caused a sudden reaction in the trade. The following are this day's quotations:—

York Regents	per ton	90s. to 120s.
Kent and Essex do.	100s. to 120s.	
Lincolnshire do.	80s. to 100s.	
East Lothian do.	95s. to 120s.	
Do. reds.	80s. to 90s.	
Perth, Forfar, & Fish. Reg.	90s. to 110s.	
Do. reds.	70s. to 75s.	
Irish whites	—s. to 70s.	
German do.	50s. to 70s.	

BOROUGH AND SPITALFIELDS, LONDON, MONDAY, Feb. 23.—Since our last report only moderate supplies of Potatoes have come to hand coastwise and by land-carriage. There is a fair amount of business doing in most kinds, at full quotations. Last week's imports were, 60 bags from Belfast, 147 sacks from Limerick, and 137 tons from Londonderry.

York Regents	per ton	110s. to 130s.
Kent and Essex ditto	100s.	130s.
Scotch ditto	100s.	120s.
Ditto Cups	90s.	100s.
Middlings	65s.	75s.
Lincolns	90s.	105s.
Blues	90s.	105s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.	s.	d.	CHEESE, per cwt.:	s.	d.
Friesland	120	130	Cheshire	64	74
Kel.	120	128	Cheddar	74	84
Dorset, new	130	134	Double Gloucester	60	74
Carlisle	110	120	Watts, York	112	110
Waterford	..	..	Westmoreland	104	110
Cork	108	116	Irish	96	100
Limerick	108	110	BACON:		
Sligo	104	114	Wiltshire, dried	70	76
FRESH, per dozen, 14s. 0d. to 16s. 0d.			Irish, green	64	68

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Feb. 23.—Our trade is in a very dull state, and prices may be quoted 6s. to 8s. per cwt. dearer.

Dorset, fine	None.
Ditto, middling	per cwt. 100s. to 104s.
Fresh	per doz. lbs. 12s. to 15s.

GLOUCESTER CHEESE MARKET was largely supplied for the season, about 80 tons being pitched, and although in the morning the trade was languid, later in the day there was an active inquiry, and nearly the whole was cleared at the following prices: Best doubles, 65s. to 70s.; singles, 58s. to 60s.; seconds, 50s. to 56s.; and skim, 28s. to 34s. per cwt.

SALISBURY CHEESE MARKET.—The quantity was about 250 tons, for which there was an animated demand, the greater portions having been sold at 1s. to 2s. over the prices of last market. Cheddars 76s. to 80s., yellow Somersets 68s. to 72s., doubles 60s. to 63s., half-cowards 54s. to 58s., skims 36s. to 40s. per cwt.

GLASGOW, (Wednesday last).—There were three carts of Cheese, and 4 tons passed the weigh-house. The market was somewhat duller. First class new 65s., second class 52s., and skim-milk 35s.

BELFAST, (Friday last).—Butter: Shipping price, 104s. to 120s. per cwt.; firkins and crocks, 11½d. to 12½d. per lb.; Bacon, 60s. to 66s.; Hams, prime, 80s. to 86s., second quality 70s. to 76s.; prime mess Pork, 95s. to 96s. per brl.; Pork, 54s. to 60s.; Beef, 100s. to 120s. per tierce; Irish Lard in bladders, 74s. to 76s.; kegs or firkins, 68s. to 70s. per cwt.

LONDONDERRY, (Thursday last).—Butter scarce, and dearer; firkins, per lb, first 1s. 0½d., seconds 1s. 0¼d., third 11½d., fourth 10½d., fifth 10d.; butts, fine 1s. 1d. to 1s. 2d., good 1s. to 1s. 1d., middling 11d. to 1s. Pork, 58s. to 60s. per cwt.

OIL MARKET.

OILS.	PRICE.	PITCH.	PRICE.
Olive, Florence	3 0 to £1 5 0	British (per cwt.)	40 6 0 7 0
half-chests	..	Archangel	0 10 6 0 0 0
Lucea	8 0 0 8 10 0	Stockholm	0 12 0 0 0 0
Gallipoli (252 gals)	61 0 0 62 0 0		
Spanish	58 0 0 60 0 0	TERPENTINE.	
Linseed (cwt.)	2 2 6 0 0 0	Spirits (per cwt.)	42 5 0 0 0 0
Rape, Pale	2 16 6 0 0 0	In Pouches	2 3 0 0 0 0
Brown	2 11 6 0 0 0	Rough	0 10 0 0 0 0
Cod (fine)	48 0 0 49 0 0		
Sea	40 0 0 50 0 0	TAR.	
Do. Brown, Yel. &c	45 0 0 47 0 0	American (British)	£1 3 0 0 0 0
Sperm	90 0 0 91 0 0	Archangel	1 3 0 1 4 0
Head Mutton	94 0 0 0 0 0	Stockholm	0 18 0 0 0 0
Southern	45 0 0 48 0 0		
Greennut (cwt.)	2 11 0 2 13 0	WHALEBONE.	
Palm	2 3 0 2 7 0	Greenland, full	£350 0 340 0 0
		size (per ton)	3 05 0 310 0 0
		South Sea	..
RESIN.			
Yellow (per cwt.)	£0 7 3 0 15 3		
Transparent	0 6 6 0 10 0		

COVENT GARDEN MARKET.

LONDON, SATURDAY, FEB. 21.—Most things continue to be well supplied, and trade is tolerably brisk. Prices have altered little since last report. French salad still consists of Endive, Lettuce, and Barbe du Capucin. Good Cornish Broccoli is now abundant. Forced vegetables comprise Beans, Seakale, Asparagus, and Rhubarb. Cucumbers may also be obtained. Pine Apples may still be purchased at last week's quotations, but Grapes are somewhat dearer. Pears are very scarce. Apples also realize high prices. Kent Cobs fetch 130s. per 100 lbs.; Barcelona Nuts, 20s. per bushel; New Spanish and Brazils, 18s. do.; and Chestnuts from 14s. to 21s. ditto. Oranges are abundant. Portugal Onions fetch from 2s. to 3s. per dozen. Potatoes have altered little since last report. Cut flowers consist of Orchids, Chinese Primulas, Cinerarias, Gardenias, Violets, Camellias, Mignonette, Heaths, and Roses.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Pineapples, per lb.	6	0 to 10	Pears, per doz.	8	0 to 10
Grapes, per lb.	12	0 to 20	Apples, per half-sieve	6	0 to 8
B. sprouts, per half-sieve	2	0 to 3	Kent Cobs, per 100lbs.	140	0 to 0
Oranges, per 100	3	6 to 9	Almonds, per bushel	32	0 to 0
Lemons, per dozen	1	0 to 2			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Cabbages, per dozen	1	0 to 1	Onions, green, per bush.	2	6 to 4
Broccoli, per bunch	1	0 to 1	Artichokes, each	0	6 to 0
B. sprouts, per half-sieve	2	0 to 3	Ditto, per half-sieve	1	6 to 2
Asparagus, per bundle	6	0 to 9	Shallots, per lb.	0	6 to 0
Rhubarb, per bundle	0	9 to 1	Lettuce, per lb.	0	6 to 0
Seakale per punnet	1	6 to 3	Letts, Cos., per score	1	0 to 1
French Beans, per 100	2	0 to 4	Endive, per score	1	6 to 3
Potatoes, new, per ton	60	0 to 135	Endive, per punnet	0	6 to 0
Do. per bush.	2	0 to 2	Small Salad, per punnet	2	0 to 3
Carrots, per bunch	0	5 to 0	Morseadash, per bundle	1	6 to 4
Turnips, per dozen	2	6 to 3	Salsify, per bundle	1	0 to 1
Spinach, per sieve	2	0 to 2	Scorzenera, per do.	1	0 to 1
Cucumbers, each	2	0 to 4	Mushrooms, per punnet	2	0 to 6
Beet, per dozen	1	0 to 2	Parley, per bunch	0	4 to 0
Celery, per bundle	0	9 to 1	Margaron, per bunch	0	2 to 0
Leeks, per bunch	0	13 to 0	Savory, per bunch	0	2 to 0
			Mint, green, per bunch	0	9 to 1

CHICORY.

LONDON, SATURDAY, FEB. 21.—About 20 tons of foreign Chicory have come to hand this week, and the market is fairly supplied with most kinds. A moderate business is doing, as follows:—

	per ton.	£10	to £11		per ton.	£11	to £12
ENGLISH	10	15	11	HAMBURG	10	10	11
HARLINGEN	10	15	11	BELEMUM	10	10	10
FLANDERS	10	15	11	GUERNSEY	10	10	11

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, FEB. 21.

MARKET HIDES	s. d.	s. d.	HORSE HIDES, each	s. d.	s. d.
56 to 64lbs.	0	5 to 0	0	0	0
64 to 72lbs.	0	5 to 0	CALF SKINS, light	4	0 to 5
72 to 80lbs.	0	5 to 0	Do. dull	9	6 to 0
80 to 88lbs.	0	5 to 0	SHEEP, Polled	9	0 to 11
88 to 96lbs.	0	6 to 0	Kents and Half-breeds	8	0 to 9
96 to 104lbs.	0	6 to 0	Dowry	6	7 to 7
104 to 112lbs.	0	0 to 0	LAMBS	0	0 to 0

BIRMINGHAM, SATURDAY, FEB. 21, 1857.

HIDES.	Per lb.	s. d.	Per lb.	s. d.	
95lbs. and upwards.	0	0 to 7	17lbs. and upwards.	0	7 to 0
85lbs. to 94lbs.	0	0 to 6	12lbs. to 16lbs.	0	8 to 0
75lbs. to 84lbs.	0	0 to 6	9lbs. to 11lbs.	0	8 to 0
65lbs. to 74lbs.	0	0 to 6	Light	0	7 to 0
55lbs. to 64lbs.	0	0 to 6	Flawed and irregular	0	7 to 0
55lbs. and under.	0	0 to 6			
Cows	0	0 to 5	Wool Skins	12	2 to 9
Flawed and irregular	0	5 to 0	PELTS	—	—
Horse each.	0	0 to 10			
Bulls	0	4 to 0	FAT Mut. & beef, mixed, 4d. to 4 3/4d.		

TIMBER.

LONDON, SATURDAY, FEB. 21.—The deliveries during the week have been rather large for the time of year. The trade, however, generally speaking, is heavy, and in some instances sales have been effected on lower terms.

Per load—	£ s.	£ s.	Per lb.	£ s.	£ s.
Quebec, red pine	3	10 to 4	10	10	10
Yel. Pine	3	10 to 4	15	0 to 16	10
Quebec Oak, White	6	0 to 7	0	11 to 11	10
Do. Breck.	5	0 to 6	Archaing Yellow	21	0 to 23
Do. Birch	5	0 to 6	Memel	15	10 to 19
Dantzic Oak	5	0 to 6	Gothsburg Yellow	14	0 to 16
Memel Fir	3	10 to 4	Do. White	11	0 to 13
Swedish	2	17 to 3	Gelle Yellow, 14 ft.	30	0 to 32
Masts, Queb. Red Pine	6	0 to 9	Christiania, per C. 12 ft. by 5 by 9 in.	8	0 to 9
Do. Yellow Pine	5	0 to 10	White	28	0 to 30
Lithwood, Dantzic fir	9	10 to 10	Do.	22	0 to 25
Do. Memel	9	0 to 10	Deck Plank, Dantzic, per 40 ft. by 3 in.	1	0 to 10
Do. Queb. C. 12 ft. by 5 by 9 in.	5	0 to 10	Staves, per Standard M.	1	0 to 10
Quebec Wh. Spruce	16	0 to 10	Quebec Pine	85	0 to 90
Do. Red Pine	17	0 to 26	Do. Picheon	22	0 to 24
St. John Wh. Spruce	15	0 to 18	Baltic Crown Pipe	130	0 to 135

WOOL MARKETS.

BRITISH WOOL MARKET.

LONDON, MONDAY, FEB. 23.—Our market continues to be very scantily supplied with all kinds of wool. The business doing, however, is confined to small parcels for immediate use, at a trifle above the late advance in the quotations. Until the result of the approaching sales of colonial wool is known, no further movement can be anticipated. Evidently, however, high rates will prevail for a considerable period.

Per pack of 240lbs.

Fleeces—	Southdown Hogs	£21	0 to £22	0
Do.	Half-bred Hogs	19	0 to 20	0
Do.	Kent	17	10 to 18	10
Do.	Southdown Ewes and Wethers	18	0 to 19	0
Do.	Leicester do.	17	0 to 18	10
Sorts—	Clothing, picklock	22	0 to 23	0
Do.	Prime and picklock	20	0 to 20	10
Do.	Choice	18	0 to 19	0
Do.	Super	17	0 to 18	0
Do.	Combing—Wether matching	23	0 to 24	0
Do.	Picklock	19	10 to 20	0
Do.	Common	16	0 to 17	0
Do.	1log matching	24	10 to 25	0
Do.	Picklock matching	20	10 to 21	10
Do.	Super do.	17	10 to 18	10

LEEDS WOOL MARKET, FEB. 20.—There has not been any material change in this market this week. Sales have been to a moderate extent, to supply the immediate wants of the manufacturers, at last week's rates.

LIVERPOOL WOOL MARKET, FEB. 21.

SCOTCH.—There continues a fair demand for Laid Highland wool, but at these high prices consumers buy with great caution. White Highland is also in fair request, and commands full rates. Cheviot and crossed are also in fair demand.

	s. d.	s. d.
Laid Highland Wool, per 24lbs.	15	6 to 16
White Highland do.	18	0 to 20
Laid Crossed do. unwashed	17	0 to 19
Do. do. washed	18	0 to 20
Laid Cheviot do. unwashed	20	0 to 23
Do. do. washed	23	0 to 23

FOREIGN.—The near approach of the London sales, with light stocks, stands in the way of anything like active operations; but the demand is good, and anything arriving is picked up at once at fully late rates.

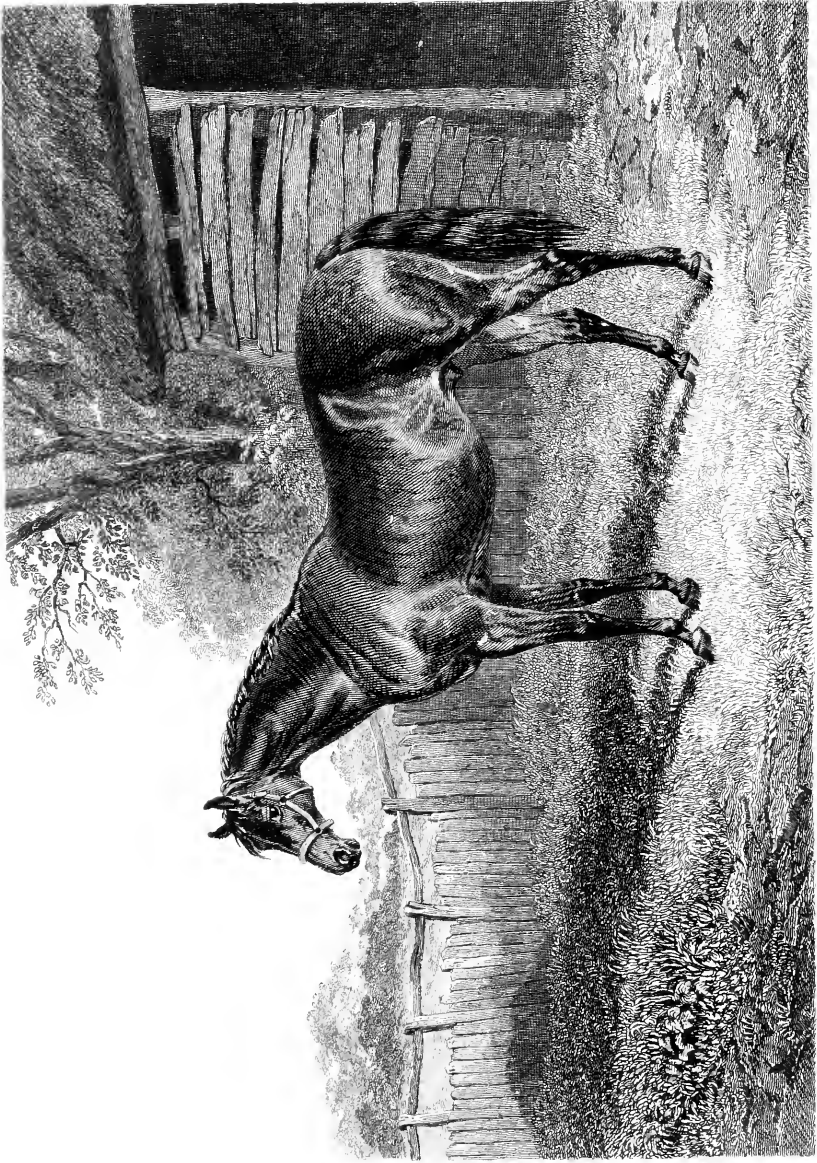
FOREIGN WOOL MARKET.

CITY, MONDAY, FEB. 23.—The accounts from the various continental wool markets state that business had been very quiet, although full prices in all instances were current. At the sales of colonial wool in London, which commence on the 26th inst., it is expected that full rates will be realized. The quantity already arrived amounts to about 32,280 bales, the greater part of which is from the Cape of Good Hope, viz., 6,151 from Sidney, 7,837 from Victoria, 816 from Tasmania, 460 from Adelaide, 77 from Swan River, and 16,939 from the Cape of Good Hope, besides about 2,207 bales of low wools from the East Indies and China. It is generally anticipated that the demand for the middling qualities of Australian and Cape wools will be very active, especially for France and the German markets, owing, in a great measure, to the short supplies of British and the increased consumption for home use.

Per lb. Duty Free.

	s. d.	s. d.	s. d.
German, 1st and 2nd Elect	3	4 to 4	6
Saxon, Prima	2	4 to 3	0
and Secunda	2	0 to 2	4
Prussian, Tertia	1	8 to 1	10
Australian & V.D. Land—Combg. & Clothg	1	2 1/2 to 2	1 1/2
Do. Lambs	1	1 1/2 to 1	3 1/2
Do. Locks and Pieces	0	8 1/2 to 1	11 1/2
Do. Grease	0	8 1/2 to 1	3 1/2
Do. Skin and Slip	0	10 1/2 to 1	1 1/2
S. Australian & S. River—Combg. & Clothg	1	0 to 2	2 1/2
Do. Lambs	1	0 to 2	0
Do. Locks and Pieces	0	8 to 1	6
Do. Grease	0	6 to 1	3
Do. Skin and Slip	1	0 to 1	8
Cape—Average Flocks	1	0 to 1	10 1/2
Do. Combing and Clothing	1	1 to 1	3 1/2
Do. Lambs	1	1 1/2 to 1	10 1/2
Do. Locks and Pieces	1	3 1/2 to 1	5
Do. Grease	0	8 to 1	4







# THE FARMER'S MAGAZINE.

APRIL, 1857.

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## PLATE I.

### VULCAN,

A THOROUGH-BRED STALLION.

ENGRAVED BY F. HACKER, AFTER A PAINTING BY J. F. HERRING, JUN., OF GREAT WILBRAHAM, CAMBRIDGE.

It is not all over yet with the glories of Dudding Hill Farm. True enough, 900 sheep and 120 head of cattle do not browse in its pastures; 500 pigs do not dream their souls away near its crowdy troughs; retired steeple-chasers—Lottery, Vanguard, Carlow, Proceed, and Duenna to wit—do not carry the bailiff on his 800-acre rounds, or trot into London, rattling their inglorious chains, as leaders in the waggon-team; and two hundred head of blood stock do not ruminare in 107 loose boxes, or prick up their ears, in the meadows hard by, to the “merrie musick” of the Neasdon harriers. A more sober order of things has set in, under the auspices of the Editor of the “Herd Book;” the boxes are gradually being devoted to oxen and kine, not put in as warming-pans over-night for a thorough-bred (as an Alderney was for Voltigeur at Doncaster), but, strictly on their own account; and the clink of busy “hammers closing rivets up” near the ring, betokens that the spot will in a few short weeks be known to all breeders, as the Short-horn Tattersalls of England.

Blood-stock have, however, not wholly retreated from their old haunts, before the descendants of Hubback, and the rest of Coates’s short-horned chivalry. Having none of that ardour which carried the veteran on his white pony through many a day of weary pedigree-chasing in Yorkshire, we cannot say that we visited that memorable seven-box row this month with exactly the feelings of yore. In the place of the chesnut Ethelbert, there was nothing but a vacuum in No. 7. The Hermit was not conferring his 2,000-guinea lustre on No. 6, nor Cleveland Short Legs (a Devonshire worthy now) on No. 5; but they formed the hermitages of a young bull and a chesnut Suffolk cart sire, with limbs like a young elephant. The hollow-backed Tearaway, who dropped down dead, like his grandfather, Blacklock, as he was returning into No. 4, just after covering a mare, has also found a successor in Vocalist, the grandson of the 1,000-guinea Grand Duke; and the massive Highland Laddie glowered fiercely round at us from the bin, where the shelly light-loined Pitsford was wont to feed. Two boxes, however, are still faithful to their first love. Chabron by Camel has succeeded to No. 2, which The Libel quitted after the sale for Sledmere, and where the elegant Lothario, the first blood horse that the Messrs. Hall ever purchased, broke his thigh and died. But No. 1 has a better tale to tell. Harkaway has left it, to end his days beyond the Tweed, at Ladykirk; Epirus has gone to the “happy hunting grounds,” and Peep-o’-Day Boy has migrated in lieu of 2,000 “yellow boys” sterling, to the land of knouts and frostbites, where General Chassé, Coronation, Jerceed, and Van Tromp, have gone before him. Vulcan is the tenant now, and save and excepting a slight sway in the back, from years, looking as fresh and well as when Nat (who had wasted 4½ pounds in two hours for the mount!) came in “hands down” on him in front of 22 for the Cambridgeshire, or when young John Day rode out the dead heat with Rhodanthe for the Liverpool Trades Cup. Giving 23lbs. to the mare, who was a five-year-old like himself, was no joke in those palmy days of Aintree, when men, and not “dolls,” went, saddle in hand, to scale. St. Lawrence, Tearaway, Bellona, Satirist, Cruiskeen, Retriever, and Cardinal Puff, had all to bow to him in his time; and whether he was carrying 12st. 12lbs. at Goodwood, or cutting down the speedy Chameleon

or Scutari over the two-year-old courses at Newmarket, he was equally at home. We should describe him as a whole-coloured and bony brown dapple, slightly over sixteen hands, with a very clean-made head, and remarkably fine across the muzzle, which is put on rather dromedary fashion. Add to this, a good neck and back, oblique shoulders, great depth of girth, with legs as fine and sound as a foal's, and rather curiously "shot" with grey hairs, and the portrait is as faithful on paper as Mr. Herring's is on canvas. He is by Verulam by Lottery, out of Puss by Teniers, and so claims kindred through Peruvian with Alexander; while on Verulam's side he strains back to Tramp and Waxy, the two stoutest sires that perhaps the north and south paddocks ever produced. True to the Tramp traditions, the "young blacksmiths" have proved themselves, both in Ireland and elsewhere, first-rate workmen over a stiff country; and by another twelvemonth we shall doubtless see not a few more of them dotting the pleasant meadows between Dudding Hill and Willesden.

## PLATE II.

### GENERAL BOSQUET, A SHORT-HORN BULL,

BRED BY AND THE PROPERTY OF F. H. FAWKES, ESQ., OF FARNLEY HALL, OTLEY, YORKSHIRE.

General Bosquet was calved on March 14th, 1855, and got by Bridegroom (11203), dam (Betty Foy) by Borrowby Boy (9980), g. d. (Lady Fairy) by Laudable (9282), gr. g. d. (Fairy Tale) by Sir Thomas Fairfax (5196), gr. gr. g. d. (Thomasine) by Stillington (5337), gr. gr. g. d. by Young Rockingham (2547), gr. gr. gr. g. d. by Driver (1928), gr. gr. gr. g. d. by Richard (1376).

In July, 1856, General Bosquet, then only fifteen months old, and the youngest of the thirteen shown, took the first prize of twenty-five sovereigns for the best bull calved since July 1854, at the Chelmsford Meeting of the Royal Agricultural Society of England.

In the same month he took the first prize of fifteen sovereigns at the Meeting of the Northumberland County Society, being here again the youngest of the seven entered.

In August—not September—he took the first prize of twenty sovereigns at the Rotherham Meeting of the Yorkshire Agricultural Society.

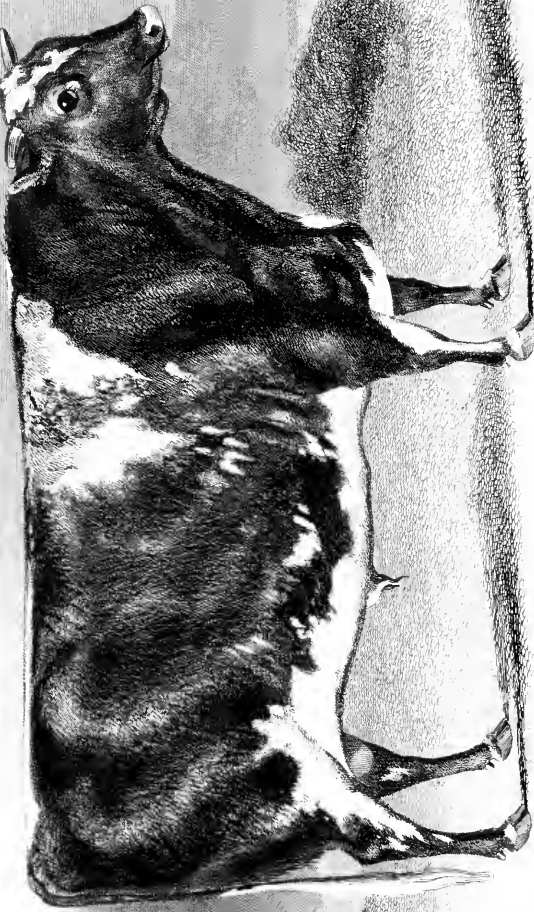
General Bosquet is a rich roan young bull, of great girth, and altogether a thickly-formed animal; very level and symmetrical, with good looks, and many excellent points. In a word, he is a credit to Mr. Fawkes' justly-celebrated herd.

## THE SOLUBLE PHOSPHATE OF LIME.

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

The history of the introduction of superphosphate of lime into agriculture may be studied by us with considerable advantage. To trace the very first researches upon the action of mineral acids upon the soil, the rude trials that were then made, the very slow introduction of the insoluble phosphates, the steady increase of its use, and the still more rapid improvement in the value of that met with in commerce, commands, as it were, our attention—will well reward us for the time we devote to the consideration of the subject. It is indeed interesting to note the zealous, the imperfect, unscientific attempts of those agriculturists who, towards the close of the last century, instituted trials in this direction. Actuated by the conviction which then began to be entertained of the importance of chemistry to agriculture, trials were here and there made; but, like those of the alchemists generally, with ill-defined objects, and generally with valueless results. The zeal of some of these

searchers after knowledge now-and-then supplied their want of scientific knowledge. Of this valuable class was Arthur Young. He lived at the dawn of modern chemistry; imbibed the enthusiasm of his great chemical contemporaries—of such men as Watt and Priestley; and, as he partook of their ardour, so he seemed, in his trials, to imitate in a great and ruder measure their modes of investigation. When Davy was describing the labours of Priestley, he in fact pretty well sketched all those of Arthur Young, as he possessed, said that great philosopher, ardent zeal, and the most unwearied industry. He exposed all the substances he could procure to chemical agencies, and brought forward his results as they occurred, without attempting logical method or scientific arrangement. He possessed in the highest degree ingenuousness and the love of truth. His manipulations, though never very refined, were always simple, and often ingenious. To his scientific deficiencies, however,





Young was sensibly alive. In the year 1790, he told his readers, at the commencement of an account of a series of experiments, "to apply air as a manure" (an excellent object, which has never yet been systematically pursued, yet whose importance did not escape the sagacity of Young). "It has never been my conduct to abandon to speculation that which can be brought to the test of experiment; but a person in such retirement as I live in, without opportunity of consulting with practical chemists—a person thus situated may feel very earnest desires to pursue a line of activity and vigour, and yet experience the mortifying conviction that, for want of a better support, his wishes may be vain, and his efforts useless" (*Annals of Ag.*, vol. i., p. 169). Still, Young was undaunted by these difficulties. He evidently had a strong suspicion that mineral acids might be useful as manures; and he tried to verify his opinion by trials which are the earliest instances of which I am aware of such an application. It was in May, in the year 1782 (*Ib.*, vol. i., p. 141), that we find him using for this purpose—1, nitric acid; 2, nitric acid and tartrate of potash; 3, muriatic acid. In pots of earth thus dressed, he sowed seeds of barley; but the success, as might be anticipated, was but poor. In June of the same year he continued these trials (*Ib.*, p. 156), then using—1, charcoal and sulphuric acid; 2, charcoal and nitric acid; 3, charcoal and muriatic acid; 4, sulphuric acid and iron filings; 5, muriatic acid and powdered flint. He applied these mixtures without success to pots of earth in which barley had been sown. He tried similar mixtures for colesseed (*Ib.*, p. 161). He repeated these experiments in 1784, for barley (*Ib.*, vol. iii., p. 39); and again, upon turnips, in 1804 (*Ib.*, vol. xlv., p. 340): and we may note how closely he approached, in these scientific—yet almost objectless—trials, the discovery of the soluble phosphate of lime; for had he used with the sulphuric or muriatic acids the animal charcoal, instead of that from charred wood, he would have been the first person who made the superphosphate of lime, and applied it as a manure. It is to be remembered that, even in Young's time, bones, or the insoluble phosphate of lime, had begun to be employed as a fertilizer; for in 1775 General St. Leger used them on grass-land, at Warmsworth. Arthur Young did the same on his Hertfordshire farm, although I have not been able to refer to the place in his *Annals* where he recorded his opinion of them. It is not my intention to trace the increasing use of crushed bones: they gradually became more and more valuable in the farmer's eyes. Other sources from which the phosphate might be obtained were suggested. I proposed the native, or mineral,

phosphates of lime for this purpose in 1830: nine years afterwards, the present mode of preparing superphosphate of lime was suggested by Liebig, in his "Organic Chemistry" (by Playfair, p. 184). He had previously ascertained that to manure an acre of ground with 40 lbs. of bone-lust is sufficient to supply the crops of wheat, clover, turnips, &c., with phosphate of lime; but as he added, "The form in which they are restored to the soil does not appear to be a matter of indifference, for the more finely the bones are reduced to powder, and the more intimately they are mixed with the soil, the more easily are they assimilated." The most easy and practical mode of effecting their division, he concluded, is to pour over the bones in the state of fine powder half of their weight of sulphuric acid, diluted with three or four parts of water. The first trials in this country with the superphosphate of lime, as a manure, were made by Mr. Fleming, of Barrochan, in 1841 (*Johnston's Lectures*, p. 28); he made it by applying muriatic acid to bones, and with the product successfully dressed swedes and potatoes. These startling discoveries shared the fate of most newly-announced improvements—they were ridiculed, adopted tardily, and then a race ensued for the exclusive appropriation of the discovery: two patents were granted on the very same day (May 23rd, 1842) to two gentlemen (Mr. J. B. Lawes and Sir J. Murray), without the slightest knowledge or communication with each other, for the exclusive manufacture and use of superphosphate of lime as a manure. These patents were the subject of several long and expensive law-suits. Both of these grants have, however, expired; and I am unwilling to do more than merely allude to their former existence.

From about the date of these patents manufactories of the soluble phosphate of lime were established, the use of the coprolites or mineral phosphate of the Cambridge gault and the Suffolk crag was sometime afterwards adopted at the suggestion of Prof. Henslow. Other improvements were also introduced in its manufacture: to some of these I now propose to direct my readers' attention.

For the first few years its composition, as met with in commerce, varied very considerably. In 1846 we find Mr. Pusey stating that the genuine superphosphate of lime ought to contain in 100 parts (*Farmer's Mag.*, vol. xxxvi., p. 307)—

Phosphate and super-phosphate	
of lime, about .. .. .	35
Sulphate of lime .. .. .	20
Organic matter .. .. .	20
Water .. .. .	20

After an interval of another five years, Professor Way, in 1851, found the composition of commercial superphosphate of lime to be as in the following

table, which gives in column I. and II. the analyses (*Jour. R. A. S.*, vol. xii., p. 223) of superior samples of superphosphate of lime, No. III. of an inferior specimen:—

	I.	II.	III.
Moisture .. ..	14.71	9.66	11.58
Organic matter, and salts of ammonia	10.18	14.50	8.33
Biphosphate of lime	13.50	15.34	1.61
Neutral phosphate	6.35	15.72	23.45
Sand, &c. .. ..	9.98	2.83	6.41
Gypsum.. .. .	36.63	26.12	26.64
Alkaline sulphates, muriates, &c. ..	3.65	5.83	21.68

Here, then, we have, in the specimens of the superphosphate of that year, from 18.50 to 14.50 per cent. of soluble phosphate. Passing over the next four years, we find in 1855 Dr. Anderson employed in their examination. In the following table will be found (*T. H. Soc.*, 1855, p. 60) the composition of a variety of commercial superphosphates; first, of three specimens made apparently from bones only:—

Water .....	10.70	17.50	13.60
Organic matter .....	12.74	15.63	24.90
Soluble phosphates.....	15.08	13.08	8.71
Insoluble phosphates....	18.01	24.65	29.14
Sulphate of lime .....	2.22	15.87	10.76
Sulphuric acid.....	18.39	6.23	7.49
Alkaline salts .....	13.06	4.63	1.82
Sand.....	9.8	2.41	3.58

Ammonia.....	100	100	100
	2.07	2.35	3.13

The next three were made apparently from a mixture of bones and coprolites:

Water .....	17.19	24.33	13.84
Organic matter .....	17.29	10.60	7.95
Soluble phosphates.....	21.22	14.38	14.18
Insoluble phosphates....	3.41	14.36	7.44
Sulphate of lime .....	20.82	16.0	21.71
Sulphuric acid.....	5.19	6.48	19.62
Alkaline salts .....	6.13	3.98	3.92
Sand.....	7.96	9.87	11.34

Ammonia.....	100	100	100
	1.66	1.03	0.93

And thirdly, three specimens supposed to be made entirely from coprolites:

Water .....	8.43	18.20	23.77
Organic matter .....	0.0	2.83	3.0
Soluble phosphates.....	15.37	14.04	12.19
Insoluble phosphates....	15.07	6.15	7.77
Sulphate of lime .....	36.03	36.88	36.23
Sulphuric acid.....	11.24	11.51	8.44
Alkaline salts .....	1.60	3.17	0.01
Sand.....	12.26	7.22	8.59

Ammonia... ..	100	100	100
	0.0	0.56	0.49

We have here the amount of soluble phosphate as high in one instance as 21.22 per cent. And we find that about this time some care was bestowed to produce a portion of nitrogenous matter in the superphosphate.

This appears to have been a particular specimen to which not many of those commonly met with quite approached. Of 171 specimens examined by Way in 1852-55, only 11 contained more than 20 per cent. of superphosphate (*Jour. R. A. S.*, vol. xv., p. 552).

In 1857 two large manufacturers of this manure have published a statement of the ordinary composition of this fertilizer (and others may have done the same, of which I have no knowledge)—viz., "The London Manure Company" and Mr. Lawes. The first state the composition of their superphosphate to be, according to the analysis of three chemists, as follows:—

	WAY.	NESBIT.	VOELCKER
Moisture.....	22.68	20.75	20.36
*Organic matter..	5.55	14.55	2.64
Silica .....	5.56	4.60	4.48
Oxide of iron—			
Alumina .....	—	1.60	—
Soluble phosphate	14.69	12.95	14.68
= Neutral phosph.	(22.91)	(20.20)	(22.92)
Insoluble phosphate .....	11.37	14.65	12.48
Chloride of sodium, magnesia, &c... ..	8.32	7.45	5.24
Sulphate of lime....	31.83	23.45	40.12
	100.00	100.00	100.00
*Containing nitrogen.....	0.35	0.49	
= Ammonia.....	0.43	0.60	

The superphosphate of Mr. T. B. Lawes, according to the published statement of Professors Way and Voelcker, to give their own words, contained on the average—

	Per cent.
Soluble neutral phosphate of lime	21.88
Insoluble phosphate of lime . .	7.

Upon the whole we may conclude that a good superphosphate will now contain from 12 to 20 per cent. of soluble or biphosphate of lime, but that the average may be taken at about 15 per cent.; but, as Mr. Way observes, the average proportion of samples in the market is below this number, being probably not more than 12 per cent.

We may, from this rapid retrospect of the discovery of this salt as a manure, and the gradual improvements in its manufacture, be fairly led to conclude that the proportion of soluble phosphate which it contains, will now in all probability, from year to year, be more and more increased: and a still more important consideration is suggested, when we reflect that there are other insoluble, yet essential ingredients in the crops of our fields, which may yet, and will probably, by the chemist's aid, be hereafter rendered as soluble and as serviceable to our growing plants as the soluble phosphate of lime.

## ARTIFICIAL MANURES.

At the February monthly meeting of the Oxford Farmers' Club,

Mr. JAMES WALKER, of Begbroke Hill, introduced the subject of which he had previously given notice, namely, "The relative merits of artificial manures, and the most beneficial mode of application."

In introducing the subject, Mr. Walker claimed the indulgence of the meeting, at he was not aware till a few days ago that he should be required to bring it forward on this occasion. He stated that his object was to gain information on this important subject, and knowing, as he did, that there were members of the club paying £100, £200, and, in one instance, £360 per year for artificial manure—namely, 30 tons of guano, at £12 per ton—he thought it was a subject worthy of discussion. It mattered not what a man paid for artificial manure, but what they wanted to arrive at was the greatest return for his outlay of capital, or, in other words, what money in reality artificial manure was worth. He would, therefore, strongly urge upon the members of the club, before they extended their liberality abroad, to begin at home, and engage some analyzing chemist to make them acquainted with the different components which their soils contained, in order that they might be able to put the right manure in the right place. That would be going to the foundation of good farming, and they would benefit by it in a two-fold manner, inasmuch as they would not only know the requirements of the soil, but also the real value of the artificial manure purchased. He believed that, however beneficial 4 out of every 5 applications of artificial manure might appear, they would be materially improved if they knew the requirements of the soil, and the material most suited to it. It would be admitted by every one connected with the growth of the root crop that every succeeding year produced some new feature in connection with that valuable plant; there were great doubts whether that result arose from degeneration or natural causes, such as frost, &c., or from artificial causes. He was of opinion that it too often arose from the over-application of artificial manure with an over-abundance of ashes, which destroyed at a much earlier period than they anticipated the vegetable blood; that did not become manifest, even to the daily observer, for a certain period. He was firmly convinced that if less was applied to the vital parts, and more sown broadcast, it would greatly improve the quality, if not the quantity, of the crop at the storing season;

and he was also of opinion that the root crop received as much support from the surface soil, or even more so, than from the sub or root soil; for instance, if they took 1½ inch of soil of newly-broken land, what could they do in the shape of growing turnips, even where they had all new soil for their rootlets? If they studied the book of nature, they would find that the works of Providence were equally marvellous in the vegetable as in the animal kingdom, and that every plant and every root was provided with certain vessels to perform every function required by nature. In 1855 he (Mr. Walker) entered on his occupation, and nearly all his crops were destroyed by the application of too much artificial manure; consequently he paid particular attention to the subject, and tried various plans, so that his observations were founded on practical experience, and not from theory; in fact, on several points he differed very materially from others. He would call their attention, in the first place, to a 12-acre piece drilled with superphosphate, at the rate of 3½ cwt. per acre, on 10 acres of which the manure held out, but not on the other two, and therefore they were drilled with ashes alone. For months no manifest difference could be seen, even to the closest observer; but the first indication of disease was more yellow under the leaf, and as the season advanced the 10 acres became very rotten, whilst the other 2 acres were comparatively sound. Now with respect to superphosphate, the composition varied considerably, inasmuch as some was prepared from raw bones, some from boiled bones, and some from bone ashes, through the agency of sulphuric acid. As they could not arrive at any conclusion as to the genuineness of this manure, they should protect themselves by getting the advice of some competent chemical analyst. His next piece was 11 acres of deep soil, drilled with three sacks of bone-dust per acre, and a better patch of swedes he never grew, but 9 out of 10 were rotten; and in putting his ewes on them, thinking to make the best of them, he had 50 dead lambs to 7 live ones. He did not mention these facts to depreciate the value of bone-dust, because on some soils it acted advantageously. His next piece was 13 acres of turnips and swedes, sown broadcast, and, previously to hoeing each time, he saw more improvement than in any of his other crops; and the result was that there was scarcely a rotten one, although they stood until March, whereas parts of the other crops were stored at the proper season. He was convinced, however,

by his own experience, of the superiority of the blood manure mixed with guano, and it was the best suited for his soil; for although he had not fallowed one acre for either swede or turnip, he could not desire a better crop than he had grown that year. As regarded superphosphate, there was no manure so easy of adulteration, and it had been known to contain but small traces of ammonia or nitrogen, and as high as 45 per cent. of water, which was easily accounted for, in proportion to the saline compounds mixed therein, rendering it a useless and worthless article, concealed only in the shape of superphosphate, the best compositions averaging about 20 per cent. The next piece he drilled with bone-dust, and had 9 out of 10 rotten; but he did not mention that to depreciate bone-dust, because it was a valuable thing in some cases, while in others it was an injury. Nitrate of soda was also easy of adulteration; but that was not of so much consequence, as it was not put on cereals, but on clovers and grasses. Now, with regard to artificial manures generally, and looking at them in all their bearings, his advice was to do without them as far as possible, and substitute real for artificial manures. It had been said that the man who grew two blades of corn where only one grew before was a benefactor to his country, and, on the same principle, that remark applied with equal force to the man who grew 2lbs. of meat where only one was grown before. He was led to ask himself the question whether he was justified in making so large an outlay in the shape of artificial manures, when they all knew that there were many unscrupulous persons in the manufacture of them, for he was sorry to say he had used some which contained only mere traces of the productive compounds; he did not, however, condemn all the traders for the sake of a few, and thought they ought to give every encouragement to the faithful and honest vendor. It should, however, be borne in mind that even the real effects which a manure produced were not always a guarantee as to its genuine quality, inasmuch as the season, the soil, and the crop intended to follow for cultivation, had considerable influence. With these observations on artificial manure, he would venture now to call their attention to that universal manure—good farm-yard manure, well made. It lay in their power to improve upon it, and to extend its quantity and quality as far as possible; and they ought to do so, because it contained every element required by vegetation of all descriptions, whether cereal, vegetable, or bulbous, and was applicable to all soils, rendering a lasting and effective support to the succeeding crop. Such was not the case with artificials, most of which were characterized by a specific action, rendering their effect on the

succeeding crop of small importance. It was true that on extreme occupations, where cartage of dung would be easy, artificials might act as well, whereas if they succeeded in getting a good crop of swedes or turnips they had all the requirements for the rotation of crops. He was of opinion that artificial food was a cheaper outlay than artificial manure, and they had a double advantage, for they were certain of getting a genuine article, and one suited to all purposes. He contended that oil-cake or other artificial food was cheaper at £11 per ton than artificial manures, looking especially at the alarming point to which adulteration had reached. If adulteration were to continue as it now existed, and they needed artificials, he suggested that it would be better to obtain them in the shape of compounds, which could be had easily and separately. In conclusion, Mr. Walker said he could hardly hope that a meeting like the present would be unanimous in opinion, farming as they did on such different soils, and entertaining various opinions. He claimed their indulgence for the few practical remarks which he had ventured to make, and, while he thanked them for their attention, he hoped to hear more valuable observations from others on a subject which deeply concerned, not only themselves, but the whole community (much applause).

Mr. G. OSBORNE thanked Mr. Walker for the able manner in which he had brought this interesting subject before the meeting, and remarked that artificial manures reminded him of a rat-catcher who laid a bait and promised a great deal, but it turned out all moonshine and deception. Mr. Walker had told them that 9 out of 10 of his roots proved rotten where he had applied artificial manure; and although the British farmer was ready with purse in hand to purchase artificial manure, the first thing which shied him was the enormous price, and the next was the gross deception that was practised; for he (Mr. Osborne) had seen manures which did not possess one-twentieth part of the qualities which were attributed to them. In his opinion, the best artificial manure was beans, peas, &c., to be applied through the medium of a sheep and beast. Mr. Walker's views amounted to that, for he urged them to make the best use of their own farm manure, because they knew the market value of it; but what farmer knew the value of the artificial article? With respect to the application of manure to the soil, suppose they took a quantity of tegs, feeding them off with pulse, beans, or oats, at a cost of 5s. per bushel, one-half was returned to the farmer in mutton and wool, and the other half went to the land in the shape of manure for the preparation of the next crop. He had heard that new pulse had a tendency to cause the



death of animals, but he could not speak of such being the case from his own experience, although he thought that excess of food might tend to the premature death of beasts. With respect to artificial manures, he thought that Peruvian guano was the best, and he was borne out in that view by the fact that the Royal Agricultural Society had some time ago offered a prize of £1,000 for a substitute for it, but none had yet been devised, and no person had proved that he was entitled to the prize.

Mr. J. PRICE, of Glympton, said that Mr. Walker had supplied valuable matter for reflection on the merits of artificial manures and their uses. Agriculture was in that state that they could not dispense with artificial manures, which were the greatest boon ever discovered in the history of agriculture, both to the farmer and the community at large. With regard to the use of artificial manures, and the soils for which they were adapted, he had had some experience, having used them to some extent for the last few years. With respect to the rotting properties attributed to them by Mr. Walker, they were, to his mind, unaccountable. In 1855, one of Mr. Barnett's tenants used blood manure in one part, and applied ammonia phosphate to another, and in the winter he called his attention to the two, when he found that on the ammonia phosphate piece there were two-thirds more rotten than on that where the blood manure had been used. In the following summer he (Mr. Price) made a similar experiment with a totally different result, which, perhaps, might be attributed to the difference of the soil. The manure might have been adapted for one soil but not for the other, and therefore he thought, with Mr. Walker, that they ought to know the nature of their soils, otherwise their efforts might be abortive, and they might lose their crops through using the wrong manure. How to get at that knowledge of the different soils was a difficult matter, but it struck him some time ago that a society like the Oxford Farmers' Club, numbering between 200 and 300 members, ought to raise its subscriptions to such an amount as would enable it to employ some able chemical analyst to analyze their soils, and recommend what manures to apply to them, so as to have the best information, and to be in a position to prevent that unhappy employment of costly manures, which only defeated the objects they had in view. With respect to Peruvian guano, he thought that it was the best and cheapest artificial manure; they were at a distance from the ocean, but the application of salt had the effect of strengthening the straw and increasing the quantity and quality of the grain. Last year he planted oats on poor land which he well manured, and succeeded in getting 10 quarters to the acre on part, and 8 quarters on

the whole, which was such a crop as he never expected to get. Mr. Price concluded by remarking that he had seen the evil of drilling the whole of the manure with the turnip-seed, and the advantage of applying half broadcast and half with the seed, and it was far better than when the whole was applied at once.

Mr. WILLIAMS, of Northcourt, said that this question was one of deep importance to the practical farmer, and much depended on the nature of the locality where they were about to apply the manure before they could test its value. If they lived in a neighbourhood where they could dispense with cereals, then came the question of cheap manure; but, situated as they were, and obliged by varied circumstances to consume cereals grown on their farms, it became a matter of the first consideration how they could consume the straw to the best advantage in forming the basis of manure for their turnip crop, which was the foundation of the four-course system. It had been remarked by Mr. Osborne that one-half of the outlay of manure was returned in wool and mutton, and the other half in the improvement of the land, but the question was whether that was the proportion, or whether it was more or less in amount. That proportion must be determined entirely by the relative value of the raw material used in the consumption, and the value of the article produced. For instance, some four or five years ago barley was from 18s. to 22s. per quarter, and meat was at 6d. per lb., whereas now barley was worth double, but meat, instead of selling at 1s. per lb., was about the same price as before; therefore they were producing meat at a less value than when corn was cheap. Mr. Williams then entered into a variety of details to show that the crops raised by artificial manures bore no proportion to those raised by good farm-yard manure. He mentioned that Mr. Stacy had used on some of his turnip land 6 cwt. of London sewage manure, which produced 4 tons to the acre, and were seven days earlier than the others. He (Mr. Williams) was in favour of using farm-yard manure on their crops, availing themselves of artificial manures to help them on. They should first look to the component parts of their land, and by testing it one year they would be better able to come to a conclusion as to what was the best system to adopt in a number of years. With reference to the mode of application there was much difference of opinion, and it had been suggested that drilling the whole of the manure caused nine-tenths of the roots to decay, which was not the case when only half the manure was drilled, and the other half broadcast. With respect to guano, it no doubt, when properly applied, produced great results, but where it was not properly applied it had failed. His own idea

was that it should be used as a top-dressing, and in moist weather, because the moisture of the earth absorbed its properties, whereas in dry weather, instead of being taken to the roots, they evaporated in the air. Mr. Williams then moved "That the consumption of corn on the land with sheep, and with cattle and pigs in the homestead for the conversion of straw into manure, should form the basis of the turnip crop, and that artificial manure should be used as an addition, especially in bringing that crop to an early stage for the hoe, and that the artificial manure should be drilled or sown immediately under the plants."

Mr. PULLEN, of Thumley Hall, seconded the motion.

Mr. WILSON, of Stonor, thanked Mr. Walker for introducing this subject, and giving them the results of his experience, and expressed his opinion that a man who had plenty of farm-yard dung need not employ artificial manure. It was of the highest importance that they should understand the nature of the soils they were cultivating, and every member of the Royal Agricultural Society could have a chemical analysis of his land on moderate terms, which would form a guide to his future operations. With respect to the premium offered for a substitute for guano, he begged to remind them that Messrs. Gibbs had raised it to £2000, and had advanced the price of guano £2 per ton. He thought they might consult Professor Nesbit with advantage, for he was one of the best analytical chemists of the day, and had done more for the elucidation of the growth of crops than any man in the kingdom. It behoved every man to see what his soil was capable of producing, and if 5 cwt. of salt could be made to produce 7 tons of mangold, it was worth their attention. It was generally admitted that farm-yard dung comprehended every quality that was necessary for vegetation, and the conclusion which he came to was that before they expended any money in artificial manures, they should make themselves thoroughly acquainted with the nature and requirements of their soils.

After some desultory remarks, the adjournment of the debate was moved by Mr. Scott, of Kiddington, and seconded by Mr. H. Turner, of Woodstock.

The meeting then broke up.

On the monthly meeting in March the discussion was resumed by Mr. SCOTT (of Kiddington), who said that, on resuming the important subject brought before their notice at the last meeting, he should do little more than state his reasons for moving the adjournment of the debate, and then leave it in abler hands for further discus-

sion. He was aware that there were several members present at the last meeting who wished to express their views, had time permitted, and also that many others of great experience were then absent, but who he hoped were now present to give their opinion on the subject. As regarded the resolution moved by Mr. Williams, on "the best mode of applying manures to the soil," he perfectly agreed with him; but as he considered the leading point in the discussion to be "the relative value of those articles," and that nothing was said respecting that in the resolution, in his opinion it was rather objectionable. They were highly indebted to Mr. Walker for bringing forward this subject, as it was one that materially concerned every one who was interested in the cultivation of the soil; and they were the more indebted to him because he did not come forward to tell them of his success, but of his failures, and of failures which appeared to him very mysterious. He (Mr. Scott) could not see why 3½ cwt. of superphosphate, or 3 sacks of bone-dust per acre, should have such an injurious effect upon the crop, provided the land was in a sound state: therefore, as a member of this club, he begged Mr. Walker to give them a little information respecting the nature of the soil to which the manure was applied. He did not wish that he should analyze his soils for that purpose; as he could not agree with those who told them at the last meeting that, to get at the foundation of good farming, it was necessary to employ an agricultural chemist to analyze the soil. In some cases it might be advantageous; but he had no hesitation in saying that the result would be in general unsatisfactory. What was the reply of Mr. Nesbit, one of the greatest agricultural chemists of the day, when the question was proposed to him by one of the farmers of Cornwall, at their annual meeting in November last? He said that it would be very well to know the nature of the soils before applying the manure, but that "the analyzation of soils often reminded him of the man who, having a house to sell, came with a brick in his pocket, as a sample of the house." He said also, that "there might be almost fifty kinds of soil in the same field," and that "what was the nature of the soil of any particular farm was a complicated question." But he (Mr. Scott) thought differently with regard to manures; they being for the most part a manufactured article, the seller should be able to give the purchaser an analysis of his purchase, as a guarantee of its genuineness. And as there were parties who would treat with the farmer on those conditions, of them the manures should be had, rather than buying a lower-priced article without that guarantee. As to the manner of applying artificials to the soil, he thought, with Mr. Williams, that the best way was

to use them with farm-yard dung for a root-crop; but as sufficient of the latter could not be obtained, how should the other be applied alone? That, he thought, depended upon whether they sowed on the ridge or on the flat. On the ridge system he preferred broadcast, then ridging up, and drilling in the seed; on the flat system, drilling the manure under the seed, not allowing the two to come into contact. Any manure between the rows was worse than useless, as it encouraged the growth of weeds, which they endeavoured to destroy by means of the horse-hoe. When used as a top-dressing, it should unquestionably be applied in moist weather: and always, if practicable, harrow or hoe as soon as possible, in order to prevent the evaporation of its volatile parts. In conclusion, Mr. Scott said he would not trouble them with any feeble remarks of his respecting the relative value manures, as the subject would be taken up by others far more able than himself, and who, he was certain, would do justice to its importance.

Mr. MEIN, of Blenheim Park Farm, being called on, said that, after the able manner in which the subject had been introduced and handled, it might be considered presumption in him to attempt to improve upon it, and he would not have risen except to give his own practical ideas upon the application of artificial manures, which he thought no man ought to deny giving. The mover of the subject (Mr. James Walker) had but very slightly alluded to the use of artificial manures as a top-dressing for corn crops, but confined his remarks chiefly to the root crop; but he (Mr. Mein) thought they ought to devote their attention to both. They were all well aware that all manures were easily adulterated, but not so easily detected; but, notwithstanding the fear of adulteration, it would never deter him from using artificials as a top-dressing. He recommended them to go to a respectable dealer and purchase their artificial manure, and if they were still doubtful of its quality, then go to an analyst. The best top-dressing he ever used for corn was Peruvian guano, at from 2 cwt. to 4 cwt. per acre: for wheat he would apply 2 cwt. in the autumn before drilling, and 2 cwt. in spring—always in moist weather. For barley and oats he recommended 3 cwt. to the acre; and for grass, 3 cwt. and salt 3 cwt. to the acre; and there was no better application. In applying it, he would not do so till April, when the weather was damp. He had tried superphosphate, to see what effect it had as a top-dressing, but he found that the land where he applied it to was not one shilling the better for it. As to other manures—of which there was an endless list—he would not mention any but superphosphate, guano, and nitrate of soda; and would pass unnoticed, and not condemn, others, although

there was not one which he had not tried. With other manures it was necessary to put up marks to show where they were applied; but it was not so with guano or nitrate of soda, for they told their own tale, and it would be seen at once where they had been put. With respect to nitrate of soda, he considered it next to Peruvian guano; but it had got to such a price that they were almost excluded the use of it. It was almost as magical in its effects as guano; and he always found great benefit from it when applied to force seeds forward for early cutting. On grass lands he found a good top-dressing was bone-dust, 8 bushels to the acre, with from 30 to 40 of turf-ashes, mixed, and the earlier applied the better. Mr. Walker's method of feeding with cake and corn, both in the yards and upon the land, was good; but he did not consider that any reason why artificial manures should not also be used. He (Mr. Mein) did not consider that artificial manures could be dispensed with. For the turnip crop he preferred mixed manures, namely—guano, salt, and dung; guano and salt; guano and dung; guano and bones; guano and superphosphate; and superphosphate and dung. The swede required the best treatment, and he never grew them so well as with guano and dung; he therefore preferred applying half farm-yard manure and half guano, as by that means, in place of growing 50 acres of swedes, he could draw his dung out to 100, and there was none of the varieties so well worth attention as the swede. Take a farm of 800 acres, and reduce all the straw of one crop to good dung, and to grow a good crop of roots they might put all that year's manure on 50 acres, and not overdo them. What, then, was to become of the remainder of the farm? They must apply artificials. But if they applied that manure to 100 acres, and gave them from 2 cwt. to 4 cwt. artificial as well, they might make it all swedes and mangels, and grow a much greater bulk of roots; they would grow them far better that way than by applying all dung or all artificial. On the remainder, with artificial only, they might grow good white globes or tankards, but not swedes. To limit the growth of roots only so far as the farm-yard manure would go, or vetches fed off with cake and corn, they could not intend the present population to have much beef or mutton. The metropolitan markets showed at present a lamentable deficiency, notwithstanding all the artificial applications to the soil; and were they to drop the use of them, the case would be much worse. Much had been said about the adulteration of artificial manures, but he considered that the farmer was more to blame than the manufacturer; and he looked on it not as an adulteration, but a reduction. In the years of low prices—1850 and 1851—when the farmer was soli-

cited for his orders for artificial manures, his answer was that he could not afford to buy at such prices, but must have something cheaper. The manufacturer met his views by making a cheaper article, and in place of selling him a genuine article of Peruvian guano at 14 gs. per ton, he sold him an article at little more than one-third the price; for they might reduce guano from £15 to £5, while with regard to superphosphate it might be made at any price. The Messrs. Gibbs, who had been the bugbear, had been badly treated as regards the price; and the farmers should have done their best to coax the trade when the price was but £9. The Royal Agricultural Society had offered a premium if a manure could be manufactured as good as guano at £5 per ton; but none had been found to this day. In offering that premium, it only showed that, notwithstanding all the attempts made by that and other societies to upset Messrs. Gibbs' arrangement with the Peruvian Government, it was an unfair way to go to work. The result had shown that they had got the manure in their own hands, could raise the price to what they pleased, or withhold it altogether if they thought proper. There had been deputations to the Board of Trade on the subject, which were of no avail; but if the agricultural societies and farmers' clubs had petitioned the London and Liverpool merchants, they would have attained their purpose much sooner. The want of guano to the man who had been in the habit of using largely was a serious affair; for what was to fill up the gap? Superphosphate would not do it; and if it did, what was to be the price this year? for the bone-holders and sulphuric-acid manufacturers had it in their own hands, and would not offer 100 tons at the present time for more than a fortnight. The failure of the root crop would, in his opinion, be felt far more even than the potato crop. They must not look to the application of farm-yard manure in such cases only as Mr. Walker's, where he was well situated, and his farm buildings were in the centre of his arable land; but they must consider the number of acres of land which were inaccessible to the manure-cart, where guano and superphosphate had been applied by being carried up those hills on horseback. With respect to the extreme application of manure, Mr. Walker attributed the failure of his root crop to that; but he (Mr. Mein) would rather see his crop rotted by extreme application than otherwise; and, as far as his experience went, he would rather see a heavy crop of wheat with some black heads than without them, for he never saw a great crop of corn without black heads among them. If they went to the other extreme, by using ashes, they might get, as Mr. Walker said he did, a crop of turnips without any disease, but they would be about the size

of the top of his thumb, and stand any weather; but he (Mr. Mein) would rather have a large good crop, with something to rot; and in his opinion it was better to plant early than late. In all his experience, he never saw that the lavish use of manure had a tendency to destroy the root crop. White globes sown in May could not be expected to be all sound in May again; and therefore his advice was to plant early, and store early. On the last occasion Mr. Williams, of Northcourt, moved the following resolution—"That the consumption of corn on the land with sheep, and with cattle and pigs in the homestead for the conversion of straw into manure, should form the basis of the turnip crop, and that artificial manures should be used, as an addition, especially in bringing that crop to an early stage for the hoe; and that the artificial manure should be drilled or sown immediately under the plants." Now he (Mr. Mein) did not consider that that motion went far enough, or sufficiently conveyed the views of the club upon the subject, under discussion; and, for that reason, he begged to move the following amendment:—

"That this club considers the use of artificial manures is still too much limited; that Peruvian guano, as a standard, is the best top dressing for corn crops; farm-yard manure, guano, nitrate of soda, and bone-dust, for grass land; that mixed manures are the best for root crops, and that without a liberal use of artificial manure the present extent of land in this country could not be kept in cultivation, as there is nothing that has tended more to assist high farming than the introduction of artificial manure; and, finally, that this club does not consider that the decay of the root crop is attributable to the lavish application of manures."

Mr. H. TURNER, of Woodstock, seconded the amendment, and said that, having been a farmer all his life, he agreed with Mr. Mein that there was nothing so good as a top dressing for any corn crop as Peruvian guano. There was nothing so good for the root crop, if properly applied, but it should be applied with the drill under the seed, or with the seed. He had, however, seen famous crops of swedes that were grown with nothing else but superphosphate, about 2½ cwt. to the acre. The gentleman who grew them, and whom he (Mr. Turner) supplied with the superphosphate, was Mr. T. E. Miller, of Southfield Farm, near Oxford, and he had very kindly sent six of the roots for the Club to see and judge of their quality. Three of the roots now produced were part of a crop where the seed was drilled in with 2½ cwt. of superphosphate to the acre in the last week in June, after fallow for turnips; the other three were after a crop of rye grass, fed off with sheep, and was treated in the same way. The roots were now before the

Club, and he would leave it to say whether they were not sound and good. He was sorry to hear Mr. Walker say that nearly all his crops had been destroyed by the application of too much artificial manure, but thanked him for having brought forward this subject. The gentleman who grew the roots which they had before them said that if they could find one rotten one, he would give them the crop for nothing. He (Mr. Turner) a few days ago rode over 45 acres of swedes, grown under Mr. Mein's direction, and he did not see one rotten one; those were pitted; but, on Friday last, he walked over another field, under Mr. Mein's management, where the crop was growing at the very time, and the only roots that were rotten were those which had been bitten by rabbits and hares. With respect to the application of artificial manure he (Mr. T.) had not had much experience in this country, for he left it, and was away for 16 years, and when he returned the improvement in agriculture was perceptible to everybody. He would not go so far as to say that it was entirely owing to artificial manures, but he thought it had produced a great deal of it, and it was owing also to the introduction and adoption of a better class of implements. At the same time there were many men farming poor tracts of land, which would not be worth much without the use of artificial manure, and without which they could not produce that fine quality of meat and corn. He would not go so far as the honourable and learned member for Handborough, Mr. G. Osborne, as to tell them what proportion of food went to supply the animal with fat and flesh, and what proportion to the land, but would leave that part of the subject to parties possessing more experience than himself.

Mr. J. SECKHAM said that, as a vendor of artificial manure, it was natural that he should take a great interest in this subject, because the decision of a body of practical men like the Oxford Farmers' Club would have some influence in this county, especially on what kind of manure should be employed. He cordially concurred in the remarks which had fallen from Mr. Mein and Mr. Turner, and wished to impress upon the Club the fact that the vendors could not regulate the price of manures, for this reason—they were not the manufacturers, but merely agents. They solicited orders, and gave the price; but when they wrote to the London agent they found that the price was advanced, which would account for some other customer having been previously supplied at a lower price. None knew the fluctuations of price so well as those vendors who had to go with money in their hands to make purchases; for as it touched their pockets, they had a lasting remembrance of it. As to the relative merits of guano and other

manures, he could not enter into them, as he had never been a farmer on his own account, and what little experience he had gained was from others, who had tried various manures. Mr. Mein gave the preference to guano, nitrate of soda, and superphosphate; but he (Mr. Seckham) thought he should have added blood manure, as it had been used with very great success by many parties in this neighbourhood. The vendors were obliged to keep a variety of manures, because they might have a good customer for oil-cake who desired to have some other manures inferior in quality and price to those referred to by Mr. Mein. Some who had not been accustomed to pay £14 a ton for guano, but were short of farm-yard manure, would not go to that expense, but be content with something lower in price. It was not every farmer who had got so long a purse to dip into as the Duke of Marlborough had, nor had such long heads as the Duke's agents, and therefore they acted according to their means. As the decision of this Club on this subject was very important to every vendor of artificial manures, he hoped they would not be hasty in condemning any particular kind, because it might have failed in one instance, and yet have succeeded in many others.

Mr. COGGINS, of Kiddington, being called for, said he considered that the relative merits of various artificial manures had at present been very little treated upon, and although he could not agree with all that Mr. Walker had adduced, still he had given them much to think upon. He (Mr. Coggins) was more inclined to support Mr. Mein's amendment, which commenced by stating that the application of artificial manures was too limited, and that guano, as a standard, was the best top-dressing for corn crops. At the last meeting the necessity of analyzing the soils was much dwelt upon, but he thought it would not prove of much utility; and if they employed chemists for many years, they could only come to the conclusion that the two great fertilizing matters were phosphorus and nitrogen. It was found that the application of manure must be nitrogenous or ammoniacal, and guano was the cheapest form in which it could be obtained; and when guano rose in price, all other manures advanced. Mr. Caird, in experiments which he had made, proved that the application of 2 cwt. of guano had raised corn crops from 2 to 5 qrs. per acre. With respect to farm-yard manure, he (Mr. Coggins) would apply it to arable land, because it possessed all the qualities which were required. Mr. Coggins then entered into various scientific details as to the properties of bone dust and other manures, and the effects they had produced, and urged the farmers not to be deterred from using artificial manures, because in some

isolated cases they had not, from some cause or other, effected all that was anticipated from them. As to the analysis of artificial manures, it might be necessary when buying of some parties, but not when they were dealing with the principal makers, and he could truly say that in Lawes' superphosphate he had never met with the slightest adulteration; they might buy some at £5; but that of Lawes' at £7 would be by far the cheapest.

Mr. E. LANE, of Northfield Farm, Witney, being called for, said that, as an analytical chemist, he agreed with what had fallen from Mr. Coggins. With regard to the relative value of artificial manures, they must come at once to the proportion of soluble phosphates and ammonia which they contained. The best Peruvian guano from Messrs. Gibbs they guaranteed to possess 16 per cent. of ammonia; but sometimes it amounted to 18 per cent. Superphosphate was much used, and its value depended on its amount of soluble phosphate and ammonia. Mr. Mein said he had done better with guano than with superphosphate; but he (Mr. Lane) had found in all cases that superphosphate pushed the young plant, and surpassed guano at first; but that afterwards guano surpassed the superphosphate, and therefore he recommended the mixture of guano and superphosphate. There was no better application than superphosphate to push on the plant, and afterwards guano to bring it to a good crop. In answer to a question respecting the size of roots, Mr. Lane said that, in his opinion, the moderate size possessed more nutritive matter than the larger ones. With regard to the rotting of the roots, he did not think it could be attributed to artificial manure; but he believed that superphosphate brought them quicker to maturity than when farm-yard manure was used, consequently they would rot sooner than when it was not used; they ought to be pitted earlier than when no manure was used, and the roots ought not to be in contact with the artificial manure.

Mr. SAVIDGE, of Sarsden, being called for, said, he came to learn, and not to teach; but he felt that he should be an unworthy member if he refused to give them the result of his experience when asked to do so. He had been engaged a number of years on a large occupation, and had used artificial manures to a considerable extent, especially guano, superphosphate, and nitrate of soda, having cultivated 1,500 acres, and with but one exception had not had any failure; if they weighed well the cause of failure, they would probably find it was in their own hands. He had been at a standstill as to what to do, after applying manure in a genuine state, and finding himself deceived in the results, but had arrived at the conclusion that the tillage of

the land was the only cause of failure. His experience did not lead him to join with Mr. Osborne in attributing the failures to what he called rat-catchers' stuff. He thought they ought to well weigh this question; for it was all very well where nature had done all; but there were thousands of acres which, without the aid of artificial manure, would be of no use whatever. He had been engaged on land in Dorsetshire, which was not worth 5s. an acre before artificial manure was applied to it, and now it grew turnips, of which neither he nor any grower need be ashamed. He had grown turnips by guano and superphosphate, and should be pleased to show them to the greatest grower in this country. Mr. Walker had made him almost think that they were spending a great deal of money and getting nothing; but he (Mr. Savidge) was satisfied in his own mind that the rotting of Mr. Walker's turnips was attributable to the ashes. Since he (Mr. Savidge) had used Chandler's liquid manure drill, he had grown 150 acres without having a cart-load of rotten ones. He agreed with Mr. Mein's views on this question, but hoped that the Club would not be premature in coming to a decision on the subject, as it was one where they did not know when they should get to the end. He (Mr. Savidge) had grown a good crop of turnips with 2 cwt. of guano mixed with salt; but salt would not do on clay lands; and with Lawes' superphosphate he had grown as good a crop of swedes. He had found great benefit by the application of salt mixed with guano, and sown broadcast with Lawes' manure. It was well known that at all their various markets they met lots of agents for the sale of artificial manures; he had no wish to say one word against any of them, or to recommend one in preference to another; but he was bound to say that as Messrs. Lawes had treated him so well, he had no wish to leave them. It was said that the most respectable dealers could not supply superphosphate under £7 per ton, while others offered it at £5 or £5 10s., in which case they must either supply an inferior article, or get nothing by the transaction. If every member of the Club would state his failure or success, it would assist them in arriving at a conclusion; but it was quite clear that if A bought for £5 what ought to be worth £7, he must expect to be disappointed.

Mr. STANBRIDGE, of Kiddington, remarked that Mr. Walker admitted having used ashes, and alone, and that was the great fault with ashes; there was a great difference in ashes; for vegetable ashes differed from wood ashes, and wood from coal, and it was the same with bones. He differed also with Mr. Walker in putting the manure under the plants, because the plant did not obtain all its

nourishment from the subsoil; the seed germinating should be in contact with the fertilizer; but if it were put in any other way, it would be searching for its nourishment. With regard to ashes, there was a great difference in them, some possessing a considerable quantity of earthy matter, and the

ashes of vegetable matter were better than that from burnt soil.

On the motion of Mr. King, seconded by Mr. Stanbridge, it was unanimously agreed to adjourn the discussion to the next monthly meeting. The Club then broke up.

## THE LAW OF LANDLORD AND TENANT.

Once, when a distinguished phrenologist was delivering a lecture upon the science, he was asked by one of his hearers, where the organ of common sense was situated? His reply was—Not anywhere; it is a combination of all the other faculties. And seeing that the heads of some men are so devoid of it, and at the same time so impervious to reason, we are led to imagine that the other faculties may be deficient also. We are led to make these observations from having been asked, the other day, what we meant by "Tenant-Right." Presuming that the enquirer had not long read our journal, we ventured to explain our object; and fearing that there might still be others who, like himself, had endeavoured to stultify themselves upon the question, we venture upon a further explanation.

It has long since been notorious that the laws affecting landlord and tenant are nearly or altogether in favour of the former. This has arisen from the original system of tenure, as established and carried out during the feudal period, when the tenant was a mere vassal of the lord, and was subjected to such impositions—called laws—as the other might feel disposed to inflict upon him. These at the present day are but partly obliterated from the statute-book; and as all subsequent laws have been made by the great landlord proprietors themselves, they still partake of the character of those established under the feudal system, conferring rights over the property of the tenant that are in themselves at variance with both justice and equity, and which, at this advanced period of civilization, ought not longer to be tolerated. It is the abrogation or amendment of those laws that we seek to attain, so as to give the tenant equal rights and privileges with other subjects of the State; and more especially as regards the laws immediately affecting the interests of both landlord and tenant, as represented by the latter, in the occupation and cultivation of the soil.

In the first place, it is our intention to define the operation of the common law upon this subject, and to point out some of the most striking discrepancies by which it is attended, with suggestions for its improvement. In the next, we may address our observations to agreements entered into and carried out, by leases and otherwise, for terms of years of greater or less duration.

As regards the first of these, upon a landlord letting a farm without any restriction beyond that of a verbal agreement, by which it is understood that the holder, as yearly tenant, will cultivate and manage the farm in ac-

cordance with the custom of the country, as practised in the district where it is situated—and whether so stated or not is immaterial as regards the result, the law being stringent upon that point—the landlord's interests being protected to the fullest extent by the custom, such invariably being favourable to him in almost every particular.

If the tenant pays to the landlord for any particular acts of husbandry upon his entering on the farm—as for hay, straw, manure, grasses, fixtures, &c.—the landlord is bound to pay for the same again, upon his again quitting the occupation. "As he takes so he is bound to leave," is the principle acted upon in such cases. But in the event of the tenant expending large sums by way of improvement, he is not entitled to be repaid any portion—however beneficial—although, on the other hand, he will be liable to make good any waste he may have committed, or for any injury that the land or premises may have sustained by his mismanagement—if such mismanagement can be shown to have arisen, or to have been carried out, contrary to the custom or practice prevailing in the district where the farm is situated. If, however, upon entering a farm, he finds that all the land has been cropped with grain-crops the preceding year, he will not be justified in cropping it in like manner upon quitting; and so of the working of the fallows, and selling off the hay, manure, or straw. He will only be entitled to the cost of the tillages of the former, and to be paid for the latter in accordance with the custom, as before stated. And upon his receiving six months' notice previous to the expiration of the current year of his tenancy, he must quit and yield up the premises, together with all improvements and erections that he may have effected or added, without any compensation whatever.

Here, then, we see that tenant-right, as it now stands, becomes tenant-wrong; inasmuch as the holder is bound to use the land of the lessor in such manner as the custom of the country defines, and which is generally construed to be in accordance with the *best* system of husbandry practised and carried out by others in the district where it is situated. Certain modes of cropping must be adhered to, the roots not being allowed to be sold or removed; the hay and straw to be foddered out upon the premises, and the manure arising therefrom to be left, without payment or compensation; while the ordinary tenantable repairs necessary for the maintenance of the buildings must be carried out at his expense. But, on the other hand,

if buildings of any kind have been put up by the tenant; if inorganic or artificial manures have been applied; if large quantities of oilcake have been fed out by cattle or sheep; if the land has been thoroughly drained, and roads have been made, the tenant has no claim against the landlord for obtaining compensation. All is to be sacrificed at one "fell swoop," and he thus quits the farm stripped of his investment, and generally without the slightest chance of obtaining anything at all.

It is very true that upon the large estates of our hereditary landlords such occurrences very rarely happen; but upon the smaller estates of the class of landlords who look to the letting land as they would to a trading concern, every opportunity of turning matters to their own advantage is taken.

If the landlord and tenant were placed by the law upon an equal footing, such injustice as we have described could never happen. The landlord could compel the tenant, as now, to cultivate the land in a proper manner; to preserve the buildings from injury and decay; to leave the requisite quantity of land in a state fit for cropping in the succeeding year; and to fodder out the hay and straw, as before stated. But if, on the other hand, the tenant had drained, marled, fallowed, limed, manured, and otherwise improved the land, and put up buildings, at whatever expense to himself, these should

be brought into account by way of set-off against actual or alleged dilapidations, or recovered at common law by the tenant, of the landlord.

In this country, where the land must be *forced* to produce crops, and is not dependent upon the quality of the soil alone, a large sum per acre becomes of necessity invested by the tenant, to enable him to reach the state of cultivation requisite to realize the largest amount of produce; by which it frequently happens that the investment of the tenant for such purpose approaches the value of the land itself. The average amount may, however, be estimated at 25 per cent.—a large proportion—for which no security is afforded the tenant beyond that as before stated. In all such cases we hold that the tenant ought not to suffer loss; and it is with the view of ameliorating his position, and for striking off the legal fetters by which he has been confined, that we uphold the principle called "Tenant-Right." Not seeking anything to the disparagement or injury of the landlord, but to secure to the tenant compensation to some extent for the outlay that he has made; not to shield him from the penalties his bad management may have deserved, but to balance the difference of advantages and disadvantages—of injuries or improvements—against each other, and thus to secure the best interests of the landlord, by obtaining fair and equitable remuneration for the tenant.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held on Wednesday, the 25th of February. Present: Colonel Challoner, Trustee, in the Chair; Lord Berners, Sir John V. B. Johnstone, Bart., M.P., Mr. Aytown, Mr. Raymond Barker, Mr. Burgess, Mr. Caird, Mr. Evelyn Denison, M.P., Mr. Dent, M.P., Mr. Jonathan Gray, Rev. L. Vernon Harcourt, Mr. Key, Rev. James Linton, Mr. Maning, Mr. Paget, M.P., M. Constantine N. Racotta (from Wallachia), Mr. Ridley, Mr. Scott, Prof. Simonds, Prof. Way, and Mr. Bullock Webster.

Messrs. Burgess and Key, of Newgate Street, favoured the Council with their attendance, for the purpose of explaining to the members the new mechanical mode, adopted in France and introduced by them into England, for distributing sulphur over such fruit and plants as may require the application of that dressing or of other pulverulent substances; and Mr. Keighley, of Hull, favoured the Council with his attendance for the purpose of giving details on the subject of the importation of the Carob Bean as an article of food for cattle.—Lord Berners stated, that having on the previous evening had a conversation with the Earl of Clarendon on the subject of the supply of guano from Kooria Mooraa Bay, in Arabia, he was glad to find that every effort would be made to render the importation of that manure as advantageous as possible to the farmers of this country.

The Council adjourned to their Monthly Meeting on the 4th of March.

A MONTHLY COUNCIL was held on Wednesday, the 4th of March. The following Members of Council and Governors of the Society were present: Mr. EVELYN DENISON, M.P., president, in the Chair; Earl of Powis, Lord Feversham, Sir Watkin Williams Wynn, Bart., M.P., Sir Charles Gould Morgan, Bart., Sir John V. B. Johnstone, Bart., M.P., Sir Archibald Keppel Macdonald, Bart., Sir Edward Kerrison, Bart., M.P., Mr. Dyke Acland, Mr. Raymond Barker, Mr. Barnett, Mr. Hodgson Barrow, M.P., Mr. Barthropp, Mr. Bramston, M.P., Mr. Brandreth, Mr. Bullock, Mr. Cavenish, Colonel Challoner, Mr. Druce, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Hudson (of Castleacre), Mr. Kinder, Mr. Pain (Mayor of Salisbury), Mr. Shuttleworth, Prof. Simonds, Mr. Simpson, Mr. Robert Smith, Mr. Thompson, Mr. Turner (of Barton), Mr. Jones Webb, and Mr. Burch Western.

William Roupell, Esq., of Saint James's Square, London, was elected a Governor of the Society.

The following new Members were elected:—Abbott, Evelyn, Lowdham, Nottingham  
Ankers, Robert B., Tarvin, Chester  
Arkell, Henry, Butlers Court, Boddington, Gloucestershire  
Armstrong, Robert, Over-Tabley, Knutsford, Cheshire  
Aylmer, John Boughen, Fincham Hall, Downham, Norfolk  
Brain, William, Greet, Winchcombe, Gloucestershire  
Buchanan, James, Cutton's Hill, East Grinstead, Sussex  
Catherow, James, Almers, Chertsey, Surrey  
Chowne, Henry, 23, St. Swithin's Lane, London  
Corner, I. B., Longworth, Wellington, Somerset  
Couchman, Charles, Temple-Balsall, Birmingham  
Divett, John, Bovey-Tracey, Devonshire



Drakeford, David, Dillions, Crawley, Sussex  
 Edwards, Robert V., Shottisham Hall, Woodbridge, Suffolk  
 Gouger, Henry, Frogmore House, Blackwater, Surrey  
 Haddon, Alexander, The Old Parks, Ashby-de-la-Zouch  
 Hall, John, Sibthorp, Newark-on-Trent  
 Haslam, Charles, Basingstoke, Hampshire  
 Jarvis, William, Whighton, Walsingham, Norfolk  
 Lane, William, Broadfield, Northleach, Gloucestershire  
 Massey, Richard Mantel Oliver, Midgham Park, Newbury,  
 Berkshire.

Morris, Thomas William, Bedgrove, Aylesbury, Bucks.  
 Reeve, Richard Henry, Lowestoft, Suffolk  
 Scott, Lieut.-Colonel, the Hon. Charles Grantham, 9, Eaton  
 Square, London  
 Stanfeld, Hatton Hamer, 10, Basinghall-street, London  
 Toogood, George Waugh, Hayden-Knoll, Boddington, Glou-  
 cestershire

Waters, Edward, Stafford-sub-Castle, Salisbury  
 Warren, James, Maiden-Newton, Dorsetshire  
 White, James, Lindons, Coleford, Monmouthshire  
 Wallis, Arthur, Basingstoke, Hampshire

**FINANCES.**—Mr. Raymond Barker, chairman of the  
 Finance Committee, presented the monthly report on  
 the accounts of the Society, from which it appeared that  
 the current cash-balance in the hands of the bankers was  
 £1,613.

**EXPENSES.**—Lord Portman, chairman of the Ex-  
 penses Committee, transmitted to the Council the re-  
 port of that committee, the details of which, in the ab-  
 sence of his lordship, were explained by the President.  
 The following resolutions were passed in reference to its  
 recommendations:—

1. On the motion of Mr. Raymond Barker, seconded by  
 Colonel Challoner, That no Pavilion-building should this year  
 be erected for the purpose of a dinner at the Country Meet-  
 ing.

2. On the motion of Mr. Braudreth Gibbs, seconded by Mr.  
 Turner (of Barton), That the General Salisbury Committee be  
 requested to report to the Council under what other circum-  
 stances a dinner of the Society could most conveniently take  
 place at the Salisbury meeting.

3. On the motion of Colonel Challoner, seconded by Mr.  
 Hudson (of Castleacre), That Mr. Manning's offer to under-  
 take the show-yard works at the Salisbury meeting be ac-  
 cepted.

4. On the motion of Mr. Hudson (of Castleacre), seconded  
 by Mr. Turner (of Barton), That in the Implement Catalogue  
 at the Country Meetings, the entry of each article should not  
 exceed 12 lines of printed matter: the first six to be free of  
 charge, but the remainder (one or more up to six) to be paid  
 for by the exhibitor, at the rate of one shilling per line.

5. On the motion of Mr. Fisher Hobbs, seconded by Mr.  
 Shuttleworth, That the exhibitors of implements should in  
 future pay 2s. per foot run for the amount of shedding 20 feet  
 wide, which they may engage to be constructed for them at  
 the Country Meetings, by the Society's contractor of works.

The Report was then referred back to the Committee,  
 with a request that the remaining topics of its recom-  
 mendations might be printed and sent round to the  
 several members of the Council for their consideration.

**PRIZE ESSAYS.**—Mr. Thompson, chairman of the  
 Journal Committee, reported the renewal of the Prize  
 for Microscopical Investigations; and the request that  
 Members of Council would favour the Committee, be-  
 fore the 1st of May, with their suggestions of subjects  
 for next year's prizes for essays.

**CHEMICAL LECTURES.**—Mr. Dyke Acland reported  
 the recommendations of the Chemical Committee on  
 the subjects of the Lectures to be delivered this season  
 before the Members by Prof. Way, the Consulting-  
 Chemist of the Society.

**SALISBURY MEETING.**—Mr. Cavendish, Vice-Chair-

man of the General Salisbury Committee, presented the  
 report of that committee, detailing the steps taken, in  
 conjunction with the mayor of Salisbury, for the pre-  
 paration of the land for the purposes of the show-yard  
 and the trial of field-implements.

**STEWARDS OF CATTLE.**—In the absence of Mr. Mil-  
 ward, the resolution of which he had given notice was  
 carried unanimously, on the motion of Mr. Fisher Hobbs,  
 seconded by Mr. Turner (of Barton), that Mr. Robert  
 Smith should be appointed one of the stewards of cattle  
 at the Country Meetings of the Society, in the place of  
 the late Mr. Woodward.

**TRUSTEE.**—On the motion of Mr. Raymond Barker,  
 seconded by Colonel Challoner, Mr. Bramston, M.P.,  
 was elected one of the trustees of the Society, to supply  
 the vacancy occasioned in the list by the decease of the  
 Duke of Rutland.

**JUDGES.**—On the motion of Mr. Fisher Hobbs,  
 seconded by Lord Feversham, a committee was appointed  
 to inquire into, and report to the Council, the best mode,  
 in their opinion, of nominating and selecting judges for  
 the Country Meetings of the Society.

**LECTURES.**—On the motion of Mr. Hudson (of  
 Castleacre), seconded by Mr. Druce, it was arranged  
 that Lectures by Professors Simonds and Way should  
 be delivered before the Members in the Council Room  
 on the first Wednesdays of the ensuing months of April,  
 May, June, and July, at eight o'clock in the evening:  
 the subject of the first of these lectures (on the 1st of  
 April) to be that of *Guano Deposits*, by Professor Way.

**ARABIAN GUANO.**—The President favoured the  
 Council with the result of his interview with the heads  
 of the Government in reference to the supply of Guano  
 from the Kooria Mooraa Islands. He reported that he  
 had endeavoured to bring the arrangements between the  
 discoverers of the Guano Islands and the Government  
 to a satisfactory conclusion; and that the following  
 terms had been settled between the Government and  
 Messrs. Hayes and Co., according to which guano from  
 the Islands on the coast of Arabia is to be imported into  
 this country. Messrs. Hayes give up all pretensions to  
 a monopoly under their grant. They propose to throw  
 the trade open to all ships from the ports of this coun-  
 try, and to permit them to load on payment of a royalty  
 of £1 per ton, the Government having promised the  
 presence of a ship of war for the security of the trade.  
 It will be the interest of Messrs. Hayes to introduce  
 into the United Kingdom, in the course of the next four  
 years, during which their grant lasts, the largest possi-  
 ble quantity of guano. In this way their interest and  
 that of the public become identical. They estimate that  
 100,000 to 150,000 tons of guano may be imported by  
 next spring. This the President regarded as likely to  
 be a most important service to the whole farming com-  
 munity, as the quantity and the open market must pre-  
 serve a moderate range of prices. In the event of this  
 being realised, no one, he thought, would grudge to the  
 discoverers the full and ample remuneration which such  
 an importation of guano would afford them.

**POLISH MURRAIN.**—The Earl of Clarendon trans-  
 mitted a despatch from the English Vice-Consul at

Lubeck, stating that the murrain had again broken out in Mecklenburg; and that in consequence the authorities of Lubeck had prohibited the introduction of horned cattle from that State, unless provided with a certificate declaring them to be free from the disease. This despatch was referred by the Council to Prof. Simonds, the Veterinary Inspector of the Society, for the favour of his report.

VIENNA AGRICULTURAL MEETING.—The Imperial Agricultural Society of Vienna requested the Council to favour them with a deputation to the ensuing great meeting to be held in that city.

The Council adjourned to their Weekly Meeting on Wednesday, the 11th of March.

A WEEKLY COUNCIL was held on Wednesday, the 11th of March; present: Mr. CROMPTON STANSFIELD (in the chair), Count de Wezele (of East Prussia), Mr. Devas, Mr. Goold, Mr. Jonathan Gray, Mr. Knowles, Mr. Maude, Mr. Lockhart Morton, M. Nyberg (of Sweden), Mr. Pocock, Mr. Thomas Scott, Prof. Simonds, Mr. Trimmer, Mr. Vines, Prof. Way, and Mr. Burch Western.

CATTLE MURRAIN.—Communications were received from Viscount Palmerston and the Earl of Clarendon, in reference to the pleuro-pneumonia among cattle in this country and the murrain at present raging in Taugoggen and Mecklenburg. Prof. Simonds stated his views on this subject, and thought that the Government could not be too much on their guard by taking precautionary measures to exclude the murrain; he particularly dwelt, however, upon the importance of our obtaining an exact knowledge of the true pathology of that fearful disease which had traversed the continent of Europe, before deciding upon measures for the total exclusion of foreign live stock from our markets, the average imports of which into this country during the entire year of 1856 amounted weekly to 1,602 head of cattle, 2,789 sheep, and 190 pigs. The Chairman, Mr. Scott, Mr. Goold, and Mr. Vines also favoured the meeting with remarks on the same subject; and a letter was read from Mr. Etches.

CAROB BEAN.—Professor Way favoured the Council with the following analysis of Carob Beans imported from Sicily by Messrs. Hadley, of the Old Jewry, and supplied to him by Mr. Scott, of 5, Charing Cross:

SAMPLE OF LOCUST BEAN, ANALYZED DEC. 1855.

Moisture .. .. .	13.43
Albuminous matter .. .. .	4.06
Oil .. .. .	6.76
Woody fibre .. .. .	12.42
Sugar, gum, &c. .. .. .	49.31
Other organic matter .. .. .	7.60
Mineral matter .. .. .	6.42

100.00

In the sample of Locust Bean supplied by Mr. Scott, and analyzed at the request of the Society, the seeds were found to constitute about 8 per cent. of the entire weight; they were separately examined for sugar and albuminous matter, with the following results:—

	PODS.	SEEDS.
Sugar .. .. .	60.00 per cent.	13.11 per cent.
Albuminous matter. 3.23 .. .. .	..	13.90 ..
March 10, 1857.		J. THOMAS WAY.

RIDGE-DRAINING.—Mr. Arkwright, of Sutton Hall, Derbyshire, favoured the Council with a plan of the system of draining he had employed and found effectual on his estate at Sutton.

The Council adjourned to the 18th March.

A WEEKLY COUNCIL was held on Wednesday, the 18th of March; present—COLONEL CHALONER, Trustee (in the chair), Hon. Augustus Vernon, Mr. Raymond Barker, Mr. Beale Browne, Mr. Devas, Mr. Brandreth Gibbs, Mr. Goold, Rev. L. Vernon Harcourt, Mr. Knowles, Mr. Majendie, Mr. Manning, Mr. E. W. Moore, Mr. L. Morton, Mr. Pain (Mayor of Salisbury), Mr. Pocock, M. Racotta (of Bucharest), Mr. T. Scott, Mr. Sidney, Prof. Simonds, Mr. Vines, Prof. Way, and Mr. Wood (of Hanger Hill).

Communications were received from the Secretaries of the Highland and Agricultural Society of Scotland and the Royal Agricultural Improvement Society of Ireland, on the subject of the foreign cattle-murrain; from Mr. Portier, Vice-President of the Central Agricultural Society of Belgium, on the mode adopted in England for destroying Thistles, and for burning clay for agricultural purposes; and from Mr. Warren, on suggested experiments for ascertaining the conditions under which water finds its level, or remains at rest.

Professor Simonds reported that the mortality among the cows at Paddington, which at one time had amounted to 19 per cent., had again become reduced to its ordinary rate. The cause of death in this case he attributed to the affection now so long known in this country as pleuro-pneumonia. With regard to the foreign murrain, that was a typhoid fever of a very contagious nature indeed; and he could not too strongly impress upon the Society the essential importance of information being obtained on the particular point, whether the disease showed itself at once, or remained *incubated* for a certain period in the system before fully developing itself. No steps, he thought, could be taken with advantage before the nature and pathology of the disease had been thoroughly investigated.—Mr. Vines drew a parallel between the murrain and the glanders in the horse, and thought there was no ground for alarm in reference to the importation of the disease into this country.—Mr. Raymond Barker made remarks on the extent, more or less, to which contagion might arise from the shipping employed to convey foreign cattle to our ports.—Mr. Sidney strongly impressed on the Council the necessity of despatching Professor Simonds, as the Veterinary Inspector of the Society, without further loss of time, to those districts abroad where the foreign cattle-murrain was at present raging, in order that direct and satisfactory investigation might be made by him on the spot, and the details be at once reported to the Council for their guidance on this important subject.

The Council adjourned to the 25th of March.

## THE THREATENED APPROACH OF THE MURRAIN.

There is nothing the agriculturist hears with so much alarm as any rumoured outbreak of murrain or cattle disease. In this age, especially, when the stock of the English farmer is becoming generally more and more valuable, such a visitation would be proportionately more serious. This murrain is now raging with fearful severity. Not, fortunately, in our own country; but still in those states with which we are in direct and continual communication. It pervades with more or less intensity many parts of central Europe; while from these very districts we yet continue to receive our customary importation of cattle. One animal has already been condemned on its arrival here—one of a whole herd, which may each carry with it the germ of disease! Strange to say, beyond this solitary seizure, our Government would appear so far to have done little or nothing; although the authorities in other countries are keenly and actively alive to the danger which threatens them.

If, however, any people have the necessity for using extraordinary caution and vigilance in such a case, it is ourselves. Almost every fatal cattle plague which has fallen on this kingdom has been found to have been imported. Whether our system of management be better, our feeding more generous, or merely position and climate in our favour, it is very certain that we are not prone to generate disorders of this terrible character. Beyond this, it is well known that since free trade in foreign stock has been established, there has been a clear increase in, and gradual intimacy with diseases of which we previously had but little experience. Under the best of circumstances, there is nothing the owner of a good herd greets with so cold a welcome as one of these "foreigners" hanging about his homestead. Just now we scarcely know any means too strong to be used in his expulsion. But such a step may be all too late. After the most careful and patient investigation, our best Veterinarians still declare these to be "diseases which can be far more easily prevented than cured." Further, they are known to be of that description which do not often show themselves for many days after they are contracted. An animal may thus pass as sound, which has all the poison in his system, and that may spread it as fatally as one only a stage further advanced in the attack.

If anything then is to be done, it must be done quickly. On the continent the most extreme measures are at once resorted to—proceedings which it would be scarcely possible to adopt here. If a beast is seized, this one is not only immediately destroyed, but the whole herd with which he has been going. The spread of anything likely in the least degree to contaminate is strictly forbidden, at least in those territories from which such decrees emanate. It is only here in England that we continue open to contagion until we con-

tract it; assured though we are, and long have been, that prevention is the chief recipe we have to rely on.

This matter was brought more prominently before the Government by Mr. Stafford on Friday evening. It was also spoken to by three other members well known from their connections with agriculture and agriculturists. These were Lord Naas, Mr. Paeke, and Sir John Tyrrell; the last-named of whom would appear to under-rate what the Royal Agricultural Society has previously done in threatened or actual visitations of such a nature. We confess that we think quite the other way. From what we know, the Society has never been more active—and scarcely ever so much so, as in meeting and counteracting the extension of these terrible outbreaks. We must admit, moreover, that it is to this Body we still chiefly look for the insurance of what should be immediately enacted. It will be the duty of the Council to keep the Government vigilantly alive to the danger which so imminently threatens us; as well as to urge—or rather perhaps to demand—the enforcement of such prohibitory measures as shall best attain to what the veterinary officers of the Society impress upon us is the only really successful way of dealing with the disease—that is, by never suffering it to come amongst us.

We have already referred to the decision and vigour which have characterized the proceedings of other powers. The Minutes of the Royal Agricultural Society of England will tell us more in detail what some of these are. When, about two years since, one of these epidemics was raging in Russia, the subject was brought forward at different weekly Council Meetings, when, amongst other communications read was a letter from Lord Bloomfield, our Minister at Berlin. With this was enclosed a copy of the precautionary steps adopted by the Prussian Government, and which it may be of service, in more ways than one, to repeat here:—

"These measures are to be more strictly observed if the murrain has broken out in the vicinity of the frontiers. If an infected place in a foreign country is only three miles or less from the frontier, then it is positively forbidden along a certain extent of frontier, to be marked out by the provincial authorities, and in any case along the extent that lies so near to the place infected, to admit—

- (a) Horned cattle, sheep, swine, goats, dogs, and poultry, fresh skins of bullocks and of other animals, horns, and unmelted tallow, beef, dung, winter fodder, and stable implements of any kind.
- (b) Also raw wool, dry hides, and the hair of animals (bristles excepted) are excluded, if there is reason to believe that they come from an infected place.
- (c) Only to allow such persons to pass without molestation who, according to their circumstances,

cannot be supposed either to have been in any infected place at all, or, even if they have been there, in any way to have come in immediate contact with infected cattle. All persons, on the contrary, who, according to their circumstances, may be supposed to be occupied and to have intercourse with cattle, such as cattle and leather-dealers, butchers, tanners, skimmers, are refused admission; or they must, when very cogent reasons are brought forward for their admission, previously submit to a careful purification, to take place under the superintendence of the police. The provincial authorities are moreover empowered to enforce the application of these measures, even when the infected places lie *five* miles beyond the frontiers.

"This must, in every case, happen, when a brisk and accelerated trade in the abovenamed articles takes place by means of turnpike-roads or communication by water between the infected places and the inland, or when the contagion in the interior of the foreign country has spread itself to a great extent. In cases of this kind, and especially when the spreading of the contagion in the foreign country by propagation makes rapid progress, or when other dangerous circumstances happen, then these measures are to be enforced, even when the disease prevails at a distance of more than five miles."

Again, Mr. Blackwell in a letter from Lubeck, on the contagious disease that had broken out

in Mecklenburg, says:—"The most stringent regulations to prevent its spreading or introduction should be instantly adopted, and duly enforced by the competent authorities. The most effectual way of checking the disease would be to slaughter the cattle attacked by it at once. But whether they be slaughtered or die of the disease, their carcases, as well as their excrements, should be burnt or otherwise destroyed, or at least thrown into deep pits dug for the purpose, and carefully covered up with earth. The hides, if preserved, should be tanned as soon as possible. The clothes of the attendants, the stalls, cowhouses, &c., should be purified with chlorine; and the cowhouses well ventilated before other cattle are stalled in them."

This is no merely class question. It is one that intimately concerns the whole community; although we expect it must be a class that in the first instance, at least, will have resolutely to deal with it. Whatever advantages we may derive from our commerce with other countries, our import cattle trade is scarcely one of these. Last year, as our official returns will show, the arrivals were much below an average, although they are now again on the increase. Still, however numerically strong these occasionally may be, the quality has long been deteriorating. Butchers and dealers, indeed, have of late spoken of it with unreserved contempt; and perhaps for the present the sooner the supply is stopped the better.

## THE LONDON, OR CENTRAL FARMERS' CLUB.

### THE CULTIVATION OF POOR AND HILLY LANDS.

The monthly meeting of the Club took place on Monday, March 2, at the Clubhouse, Mr. Owen Wallis, of Overstone Grange, Northampton, as chairman for the year, presiding. He was supported by the following gentlemen amongst others present: Messrs. R. Baker, Writtle; N. G. Barthropp, Cretingham; B. P. Shearer, Swanmoor; J. B. Spearing, T. Congreve, W. Ballock Webster, R. de Trehonnais, James Thomas, S. Skeiton, J. C. Nesbit, J. Crossingham, G. P. Tuxford, T. Scott, J. Bradshaw, D. Drakeford, E. Purser, J. Russell, S. Sidney, H. Shotton, J. Ambrose, C. J. Brickwell, J. Bailey Denton, H. Gibbons, W. Banwell, J. H. Sawell, C. Hall, W. Beckett, R. B. Hammond, &c. The subject appointed for discussion was "The best means of improving the cultivation of poor and hilly lands," the introducer of it being Mr. R. Smith, of Enmett's Grange, South Molton, Devon.

The CHAIRMAN observed that, in opening the proceedings, he could not help remarking upon the usefulness and variety of the discussions which took place there. In December last they had a discussion, which was introduced by Mr. Thomas, of Lidlington Park, Woburn, on the importance of an extended system of cropping for rich and highly-cultivated lands. That evening, they were going to discuss the practicability of reclaim-

ing the uncultivated moors and hills which were as yet in a state of nature. This was a subject in which every grazier in England, as well as every consumer of animal food, had a direct interest. It was to the reclamation and improvement of poor lands that the grazier must look for the means of furnishing an increased supply of store stock; and all who were conversant with the feeding of cattle must be aware that the supply was very inadequate to the increased wants of the consumers of this country (Hear, hear). He was sure the subject could not have fallen into better hands than those of Mr. Smith; but they must make some allowances for him that evening, for no doubt many of them had read the very able article which had just appeared from his pen in the Royal Agricultural Society's *Journal*, and which was, in fact, a prize essay on this topic (Hear, hear). Under these circumstances, they could not expect much new matter from him; but he was sure that everything he did say would be said well and ably. Having alluded to the necessity of an increased supply of store stock, he thought it would not be irrelevant to make one or two remarks on the preservation of the stock which they already possessed. He would refer especially to the great fears which were (as he thought, justly) entertained that the murrain which

was ravaging continental Europe to such a fearful extent would, unless timely checks were applied to the importation of diseased cattle, extend to this country (Hear, hear). He was very glad to find that one of the members for Northamptonshire noticed the subject the other evening in the House of Commons. He hoped the farmers of England would bestir themselves in the matter, and take care that it did not get into the Circumlocution Office, so that the application of a remedy would be too late to prevent disastrous consequences to this country. They might, perhaps, be charged with interested motives in wishing to see checks applied to the importation of foreign cattle; but he, for one, disclaimed any such motive. It would be much better for the consumers of England to pay a small additional price for their present supply of animal food, than to run a risk of having no such food to eat; for if this disease were introduced into the country, and made similar ravages to those which history declared it to have made in 1745 and in subsequent years, the effect would be dreadful, not only to the owners of our herds of cattle, but also to the consumers of meat generally (Hear, hear). With these remarks, he begged to call upon Mr. Smith, that gentleman being too well known to every one connected with agriculture to need any introduction.

Mr. R. SMITH said: I could have wished that the committee had solicited some other member of the club for the introduction of this important subject—"The best means of Improving the Cultivation of Poor and Hilly Lands"; but I judge that their choice could not have fallen upon a member who is more completely surrounded by "poor and hilly land" than myself. The enclosing and reclaiming of poor land have long engaged the attention of the English farmer, and we have only to point to the marked success that has followed the enterprise and outlay of capital upon the sands of Norfolk, the heaths and wolds of Lincolnshire, the chalks of Wiltshire, the clays of Sussex, the fens of Cambridgeshire, or the reclaiming of hilly wastes, to show what has been done in days gone by. These early improvements are within the recollection of our oldest farmers, and history has brought them down to the present day. The great feature of these improvements appears to have been that of an *admixture* of soils. For instance, the sands, heaths, and wolds have been consolidated by marls, others by chalk, the peaty fen lands by clay, while the clays have been changed by draining. And mark! the whole of these mixtures have taken place with the one common view of producing a soil that should, as nearly as local circumstances would admit, approach the valuable characters of our mixed loamy soils. It is due to those who have preceded us, to say that these works were carried on at a period when they had not the enjoyment of present advantages. They had not our modern implements; they had no guano or phosphates; they had no Central Farmers' Club, to discuss their intricate subjects; they had no Royal Agricultural Society to aid their enterprise; but they had this—they had English zeal at their hearts, and practice at their fingers' ends. Nay, they

had more: they had, even in those days, the forethought of establishing an equitable custom for the security of their capital. It is beyond my province, this evening, to enter upon the details of this success; but there are members present who, I hope, will give the meeting the benefit of their past experience, and full results of any new practice that has succeeded upon their farms. The poor and hilly lands of England embrace a wide and formidable acreage of our island; they are, indeed, remarked upon by the foreigner, in comparison with his visits to our highly cultivated and thickly populated districts. They stand, in this great agricultural and commercial country, as beacons for extended enterprise. The questions, then, arise—What are the local and peculiar influences bearing upon these poor lands? Why should they not receive a spirited outlay for their improvement? Have modern practice and science advanced to such a degree as to give us any new advantages in grappling with those ancient difficulties which have caused these lands to be hitherto neglected? It is evident, at any rate, that for such a bold and important enterprise extraordinary encouragement and assistance must be given by the landlord. This may be given by low rents, long leases, permanent improvements, liberal security for unexhausted investments, or by artificial manures. This leads to the inquiry as to which soils are fit for improvement, and by what means the improvement may be made. It is not for me to enter upon a minute detail of the composition of soils, barren or fertile, but to touch briefly upon their characters for improvement. The soils most susceptible of improvements are the silicious or sandy, the peaty or vegetable, the calcareous or chalky, and the clays. The silicious are poor indeed. This arises from their being so remarkably porous in their nature that they can neither collect food or retain manures that are put into them. Still, they have the merit of warmth on their side, and may, consequently, be made to bear good crops by the application of marl, clay, or chalk. This admixture has the desired effect of giving a more retentive soil, which, when coupled with the natural heat of the original soil, produces excellent crops, especially roots, from the more early germination of the seed. The peaty soils are of little value until they have been cultivated. These are best improved by "claying," as adopted in the south of Lincolnshire, and Cambridgeshire. The calcareous soils, taken as a whole, are capable of improvement. These soils, being possessed of carbonate of lime in themselves, and not unfrequently resting upon heavier soils, which may be subsoiled to good effect, they are best improved by artificial manures and root crops. The poor clays are the least desirable of all soils, on account of the heavy outlay in cultivation, and the length of time occupied before they can be brought to pay, or even into a manageable state. Their poverty originates in the saturated state they have got into. Suitable drainage is the only safe passport to their permanent improvement. As to the plans of draining I will say nothing: every practical man, who has been educated upon the borders of a sterile clay, is fully capable of being himself a "director of a company of

drainers." Neither need I occupy your time by stating the effects produced: they are alike familiar to you all. But thus much I may say—that there are to be found amongst the heavy soils of England some of the best farms and farmers that our island can produce. In connexion with the improvement of poor lands, arises the question of "breaking-up inferior grass land." This subject has already been discussed by the Club. There cannot be a doubt as to the profitable results of such a course upon certain lands; but a definite line must be drawn, to mark their several qualities, before the work is begun. Some moist lands require to be drained, and, after subsequent tillage, relaid to pasture again. Some dry and inert soils are more suitable for general tillage; while there are others so situated by soil and climate, as to be better adapted to improvement by top-dressings of lime, compost, or artificial manures. In support of their *arable* culture, it may be said that, by the recent introduction of modern implements, and that of the phosphate manures, farming lands have received a marked advantage over the pasture lands. Having so far touched upon the characteristics of our poor soils, I now proceed to notice their capabilities of improvement. These, for the convenience of our subject, may be reduced to two heads—viz., the light and heavy soils. The light soils embrace the sandy and chalk downs, heaths, and peaty ground. These, as previously mentioned, have been susceptible of improvement by the free admixture of marl or clay as a top-dressing; but these practices have been frequently arrested by the difficulty of application, and the prospective difficulty in harvesting the crops upon hilly lands, while other poor lands have remained uncultivated from local difficulties or want of capital. With the view of compressing my opening remarks into a small and convenient shape, so that a full discussion may follow, I will simplify what I have to say, by taking an acre of average land, as Nature formed it, upon poor hilly ground, and giving an estimate of its cost and produce during a period of four years, at the end of which we may fairly calculate that the land ought to be in an efficient state to be cultivated under the usual rotations of a farm. In carrying this plan of improvement out, I propose that the four years' rotation should be—1st year, roots, after the land has been properly broken up and manured, &c.; 2nd year, roots a second time, grown cheaply; 3rd year, seeded down with artificial seeds, after the turnips, with a corn crop; 4th year, growing seeds, to be grazed by sheep. Such a system as this can *now* be most easily carried into effect, by the free use of artificial manures, after the lands have been consolidated by marl, according to ancient custom. The consumption of these green crops by sheep upon the land has a decided effect upon the permanent improvement of the soil—first, by enriching it to an enormous extent; and secondly, by the mechanical effect produced upon the land by their feet. I need scarcely remark that, if artificial food were given to the sheep during the consumption of these crops, the work of improvement would be complete. The cost of improvement, upon the light lands, will stand thus:

FIRST YEAR'S cost for Turnips.		£	s.	d.
Paring and burning, or otherwise cleaning the surface soil .....		1	5	0
Two ploughings, draggings, rollings, &c. ....		1	5	0
One hundred loads of marl, at 9d. per load.....		3	15	0
Two cwt. guano, sown broadcast .....		1	10	0
Two cwt. superphosphate and farm ashes, drilled .....		1	0	0
Turnip seed, sowing and setting-out, &c. ....		0	10	0
Rent and rates (should be nominal) .....		0	10	0
		<hr/>		
		£9	15	0

SECOND YEAR.—Turnips again.		£	s.	d.
Ploughing, dragging and rolling, &c. ....		0	15	0
Artificial manures and ashes, drilled .....		1	10	0
Turnip seed, &c., rent and rates .....		1	0	0
		<hr/>		
		£3	5	0

THIRD YEAR.—Seeded, without corn.		£	s.	d.
Ploughing, dragging, rolling, &c. ....		0	12	6
Artificial grass-seed, rape-seed, and sowing .....		1	0	0
Rent and rates.....		0	10	0
		<hr/>		
		£2	2	6

FOURTH YEAR.—Seeds for grazing.		£	s.	d.
Top-dressing of artificial manure .....		1	10	0
Rent and rates.....		0	10	0
		<hr/>		
		£2	0	0

SUMMARY.—Cost of the four crops.		£	s.	d.
First year's outlay .....		9	15	0
Second ditto .....		3	5	0
Third ditto .....		2	2	6
Fourth ditto .....		2	0	0
		<hr/>		
		£17	2	6
Interest of capital, wear and tear of implements, &c., not charged.				

SUMMARY.—Value of the four crops.		£	s.	d.
First year's return, 17 tons of turnips, at 6s. ....		5	2	0
Second ditto 20 tons of swedes and hybrids, at 7s. ....		7	0	0
Third year's return, value of new seeds and rape ..		2	10	0
Fourth ditto seeds for grazing.....		2	10	0
		<hr/>		
		£17	2	0

It will be seen by this calculation, that the improvement of poor lands is a work of time and outlay of capital, but *can* be effected in the character of a commercial transaction—and this, if wished, without the cost of farm-buildings to any extent during the first four years of a lease. Still, this can *only* be done by men of capital under long leases, low rents, and security for their unexhausted investment. These improvements may be effected by tenants' capital; but I see no reason why a landlord should not contribute his part in the shape of marling or artificial manures for the light lands, upon the same principle as he would drain the clays. This would be an equitable course, and make our figures more readable. This system of green crops and sheep farming is applicable to all dry soils, especially such as have been over-cropped and exhausted of their vegetable matter. Still, in the carrying out of these practices we must first consult Nature's dictates, as to the suitability of the climate for the growth of grass, as a pursuit. As regards the *heavy soils*, I would remark that these are proverbially wet and un-

kindly for tillage; and from their indisposition to the growth of roots, they are but rarely sought after. There are many varieties of clay, some of which are equal to any soils when drained, and afford good profit from their cultivation. But, Sir, the very *sound* of a "poor clay-land farm" is enough for most men; and they rejoice in having nothing to do with it. I need scarcely observe that efficient draining is the first great work to be performed. Then follows the pulverization of the soil, to as great a depth as circumstances will admit, which may be accomplished by deep ploughing and subsoiling. The further improvement of the clays may be best effected by the growth of green crops, at the commencement of the rotation—not so much, in this case, for their consumption upon the land, as for the purpose of giving the newly-drained soil a sufficient time to correct itself before any corn crops are grown. The poor clays in their present state (without draining) are not to be trusted with the investment of tenants' capital; neither can they be improved by a tenant to a profit, as my subsequent figures will show. Therefore, for the permanent introduction of these soils into arable culture, some extraordinary efforts must be made, both by landlord and tenant. In the calculation for the light lands, it is shown that in four years the cost of their improvement (without wear-and-tear and interest of capital) will have been redeemed; but for the same work upon the clays full six years will be required to reinstate the outlay. With the view of showing the comparative data, I will supply a calculation extending over a six years' course of cropping, viz. :—

- First Year.—Dead fallow, drained.
- Second Year.—Spring fallows, liberally limed, then sown with white mustard to be ploughed in; then sown with grass seeds about the end of July.
- Third Year.—Mixed seeds, mown.
- Fourth Year.—Seeds for grazing, top-dressed.
- Fifth Year.—Beans, sown on a winter furrow.
- Sixth Year.—Wheat, sown with artificial manure.

STATEMENT OF OUTLAY.

FIRST YEAR—		£	s.	d.
By cost of draining (winter) .....		5	0	0
Three ploughings after draining, viz., in May, August (across), and November (for the winter) .....		1	10	0
Rent and Rates (nominal) .....		0	0	0
		<hr/>		
		£6	10	0
SECOND YEAR—				
Spring ploughing, dragging, &c. ....		0	15	0
4 tons of lime, and carriage (say 10 miles) ...		4	0	0
Ploughing-in lime and dragging, &c. ....		0	12	0
White mustardseed and sowing .....		0	5	0
Ploughing in mustard, &c. ....		0	10	0
Grass seeds and sowing (end of July) .....		0	15	0
Rent and rates .....		0	10	0
		<hr/>		
		£7	7	0
THIRD YEAR—Seeds for Mowing.				
Rent and rates .....		0	10	0
FOURTH YEAR—Seeds for Grazing.				
Artificial manure, top-dressing .....		1	10	0
Rent and rates .....		0	10	0
		<hr/>		
		£2	0	0

FIFTH YEAR—Beans after Seeds.				
Winter ploughing .....		0	10	0
Seed beans, sowing, and cleaning .....		1	5	0
Rent and rates .....		0	10	0
		<hr/>		
		£2	5	0

SIXTH YEAR—Wheat.				
Broadsharing and cleaning bean stubbles .....		0	15	0
Ploughing, dragging, and rolling .....		0	15	0
Artificial manure (broadcast) .....		2	5	0
Rent and rates .....		0	10	0
Seed wheat and sowing .....		1	5	0
		<hr/>		
		£5	10	0

SUMMARY—SIX YEARS' OUTLAY.

First Year .....	£6	10	0
Second Year .....	7	7	0
Third Year .....	0	10	0
Fourth Year .....	2	0	0
Fifth Year .....	2	5	0
Sixth Year .....	5	10	0
	<hr/>		
Total .....	£24	2	0

SUMMARY—SIX YEARS' RETURN.

First Year—Dead fallow (no return) .....	£0	0	0
Second Year—Value of young seeds .....	1	0	0
Third Year—Mixed seeds, mown, &c. ....	3	10	0
Fourth Year—Seeds for grazing .....	2	0	0
Fifth Year—Beans, 4½ qrs., at 36s. ....	8	2	0
Sixth Year—Wheat, 30 bushels, at 6s. 9d. ....	10	2	6
	<hr/>		
Total .....	£24	14	6

We have here the same dilemma in our profits as was shown in the cultivation of the light lands, and extending over a period of six years. This marked result clearly shows that the work cannot be done by a tenant, and points to the conclusion that drainage *must* certainly be executed by the landlord, and if he paid for the lime in the second year, the tenant doing the carriage, he would reap his reward by improving the "fee simple" of the land, and also strengthen the position of his tenant, at the critical moment of his enterprise. There is yet this question to be answered, Which are the best lands for future occupation, *after* they shall have been thus improved? I am aware that these soils have their several merits, and that they are adapted for two distinct branches of husbandry, and that while the one is producing roots, grass, sheep, and corn, the other is producing vetches, beans, clover, and wheat. Upon this I venture no opinion, as, if I did so, it must necessarily lead me astray from my particular mission—that of introducing the subject upon the card. We now come to the poor hilly lands and commons. These are to be found in the more northern and western counties. They form a considerable tract of land, and require to be better known by the sons of agriculture in our thickly-populated counties. You must excuse my position as agent for this particular branch of property, and kindly receive my remarks in the spirit in which they are given, rather than conclude that I am about to advertise the shop. By choice, I would rather adopt the convenient course of the late Dr. Abernethy, and say with him, "For information upon *this* complaint, read my book." But my book is only a brief essay on the "Bringing of Moorland into Cultivation," and will be found in the Royal Agricultural Society's last Journal. As an evi-

dence of the increased interest taken in these open hill and common lands, I may refer to the extensive enclosures that have already taken place under the new Enclosure Act, and the enormous acreage that is now under the consideration of the Enclosure Commissioners. This progress is being made by the resident owners and farmers of the immediate neighbourhood. Another official instance may be given of these advances in Devon and Somerset. I will take these counties, and place them in juxtaposition with the favourite arable counties of Lincoln and Norfolk, to show their several assessed values for the property-tax in 1815 and 1851. This is the official statement of their annual value of real property as assessed to the property-tax, viz. :—

	1815.	1851.	Increase per Cent.
Lincolnshire . . . . .	2,061,830	3,009,456	46 } 106
Norfolk . . . . .	1,540,952	2,463,593	60 } 108
Devon . . . . .	1,897,515	2,736,361	44 }
Somerset . . . . .	1,940,651	3,111,703	61 }

These comparisons give encouraging results, and show that we may yet see these almost-countless acres of unimproved lands turned to a better account. These poor and hilly wastes, being usually situated in thinly populated and highly elevated districts, are not so suitable for the subsequent growth of *corn* as the poor sands or chalks of the more thickly populated and less elevated districts of the southern and eastern counties. In bringing these hilly lands into cultivation, it is usual, first, to pare and burn the surface-soil and weeds. The land is liberally dressed with lime, and, after the usual tillage, is sown with turnips. I will give the cost, in comparison with the inland (improved) lands:—

#### UNRECLAIMED WASTE (DRY) LAND.

By piling and burning . . . . .	£1 0 0
By one ploughing and dragging, &c. . . . .	0 12 6
By 2½ tons of lime and carriage, at 20s. . . . .	2 10 0
By rent and rates . . . . .	0 7 6
	£1 10 0

In the second year turnips are again sown with artificial manures, or the land may at once be sown with grass seeds without a corn crop, as otherwise adopted in the third year. The fourth year the seeds are grazed with sheep. The result of my farming upon this class of land has confirmed my views as to the value of *green crops*, when these lands are first taken in hand. I may mention, to correct a too prevailing opinion, "that all hilly or common lands require draining, and that they are more or less of a worthless character," that this is indeed a wrong impression; and, in confirmation of my statement, I have only to quote the remarks of the late Mr. Pusey, as contained in his report of the farming of Lincolnshire, and other similar districts (see Royal Agricultural Society's Journal, vol. iv., part 2, page 298), to show that these lands are worthy of notice. Mr. Pusey says, "On returning to the West Somerset country in 1841, I was surprised to find that moors, which had formerly appeared to be fitted only for the pursuit of the Blackcock and the red deer, consist in great part of sound land—not in my opinion merely, but in that of the farmers, one of whom said to me,

'Here was land enough idle to employ the surplus population of England.'" In bringing my remarks to a close, I feel that I have detained you too long. Still I have endeavoured at every point to keep within compass, and thus to treat the many subjects as briefly as circumstances will admit. In conclusion, I may express a *hope*, that as the wild duck and other water fowl have disappeared by the drainage of our fens, the rabbit warrens by the cultivation of the heaths and wolds, and the snipe by the drainage of our moors, we shall yet see our remaining difficulties overcome by the magical effects of artificial manures and green crops as "the best means of improving poor and hilly land."

Mr. B. WEBSTER (of Neath) would ask Mr. Smith whether he would be disposed to follow the course of proceeding which he had described if he were dealing with a soil and climate of a different character. Would he, for instance, apply it to the heaths of the dry portion of Kent in the vicinity of Tunbridge Wells?

Mr. SMITH said it appeared to him that the general improvement of heaths, and of the class of dry lands referred to, would be sought first by marling or chalking, and next by the use of artificial manures for the production of green crops. He would certainly be disposed to give animals artificial food.

Mons. TREHONNAIS (of Falmouth) enquired what crop Mr. Smith would put on land newly gained from the sea—on such alluvial soil as was found in the eastern parts of the fens of Lincolnshire?

Mr. SMITH said his answer to that question was very simple indeed. Alluvial soils would grow anything they pleased to grow in them (Hear, hear). If they went deep enough, they were sure to get a crop on the borders of Lincolnshire. In the case of alluvial soils, they had simply to eradicate or clean the surface soil, and after that they would take a corn crop.

Mons. TREHONNAIS said he wanted to know what course of proceeding would be most advantageous. In France he had seen grass growing spontaneously on lands newly reclaimed from the sea. He had observed, for example, in Normandy, where a large bay having been reclaimed from the sea, that the finest grass grew spontaneously; and the question was, whether it were better to break up such land at once, or to let grass grow upon it.

Mr. SMITH said he should take Nature as his teacher. He had seen farming on both sides of the island—the dry side on the east, and the wet side on the west. On the western side he tried an experiment in a turnip field. He set apart an acre of land in the middle of a field, and prepared it in the usual way for turnips—not drilling the turnips—and they would perhaps be surprised to hear that that acre of land in the West of England was in the succeeding spring clothed with grass. He should, then, in such matters take Nature as his guide. In a case like that which he had mentioned, he would grow grass. In the other case referred to, he would produce corn.

Mr. SIDNEY (of Peckham) was glad that a subject on which there had been so much exaggeration had been treated that evening by a gentleman of practical expe-



rience. Mr. Smith was not a farmer of yesterday. He commenced farming in early life in one of the best parts of Lincolnshire: he farmed for many years in Rutlandshire, which was called the garden of England: and he now occupied with great credit to himself a farm in one of the wildest parts of the West of England, where there was a very great prejudice against strangers; yet it was only the other day that he (Mr. Sidney) heard a Devonshire farmer say that whatever could be done in that part of the country would be done by Mr. Smith. Now he did not make these remarks with the view of flattering Mr. Smith; but in order that when the reports of this discussion went forth, the public, who as a body knew very little about agriculture, might see that the man who had given an account of what ought to be done in this matter, was a man who knew what he was talking about. There never arose a period of distress in this country but that some closet philosopher came forward with a scheme for putting an end to that distress by some patent mode of dealing with the waste lands of England (Hear, hear). Such propositions could not be treated with contempt, for they had been made from time to time by men of considerable literary influence. It was not many years since Mr. Stuart Mill, one of the first political economists of the day, brought forward a proposition for setting a million of paupers on the waste lands of Ireland. A system of cottage farms was laid down in great detail: it found favour with a great number of persons, and it was only the firm resistance of the government of the day that prevented the addition of another million to the pauper population already existing in Ireland. It was impossible to take up any number of publications on economical subjects without meeting with propositions of the same kind. The other day there was a very large meeting of working men in Smithfield—not idle, worthless fellows, but industrious and respectable mechanics—and a gentleman of very mistaken views, though of very great talent and eloquence, introduced this remedy. Mr. Ernest Jones told those whom he addressed, that there were in this country 20,000,000 of acres of good land which had never been touched by spade or plough; and that on these 20,000,000 acres of land a million families might be located as self-supporting English farmers; and he went on to tell his hearers a great many wonderful things in connexion with this waste land scheme. Now he thought the present was a good opportunity of exposing the unsoundness of Mr. Ernest Jones's views with regard to waste lands. But he must express his regret that they had so very few statistics connected with agriculture that they could rely upon. It was sometimes vaguely stated that there were twenty millions of acres of waste lands in England and Scotland. It would be well if we could learn something about the quality of the land; if some gentleman like Mr. Smith were employed to go over the waste lands, and prepare a report on the subject, a vast amount of nonsense now talked would be dissipated. From the best information he could obtain, there were at the present time about 4,000,000 acres of waste lands in England and Wales; the remaining 20,000,000, described

by Mr. Ernest Jones, must consist of the barren districts of Scotland. He would then assume the quantity of waste lands to be 4,000,000 acres. Well, that quantity made a very great figure when an orator was making a speech, but it represented very little corn and beef. It included the waste lands of Wales, and any man who was acquainted with the Principality must know what an enormous amount of land there was of a cold, mountainous character, having only an inch or two of soil, adapted for nothing but the grazing of a few sheep. Moreover the 4,000,000 acres included the rocks, fells, and lakes of Cumberland and Westmoreland, and the wastes of Dartmoor and Exmoor. He would leave it to Mr. Smith to say whether the western wastes would ever make anything more than second or third-class grazing land. In riding through such counties as Lincoln and Norfolk, one might occasionally come upon a common which had not been cultivated; but when he saw the adjoining land under cultivation, he felt astonished at the courage of the men who had first ventured to put a spade or a plough into such soil, the result being in many cases a large expenditure of capital and labour, with a very moderate return on the capital expended. Now he found that, between 1710 and 1850, 8,000,000 acres of land had been enclosed. He need not enter, at a meeting like that, into a history of the reclamations of Norfolk and Lincolnshire; but he would observe that, considering the spirit and enterprise of Mr. Coke, and other landowners of those districts, it was a reasonable inference that the land left unreclaimed was not likely to yield a very brilliant return, though a great deal of it might gradually be brought into cultivation by a large expenditure of oilcake, manure, and artificial manure. Indeed, speaking generally, he should be glad to know where the rich fertile waste lands which were sometimes spoken of were to be found (Hear, hear). He knew of only one instance in which the prejudices of a noble landowner had prevented the cultivation of a considerable tract of land. He referred to Cannock Chase, which consisted of about 20,000 acres of land in the centre of Staffordshire, and which belonged to the Marquis of Anglesea; but that case was also other exceptional—he should be glad to hear of any other instance of the same kind. Well, now, having reduced Mr. Ernest Jones's 20,000,000 acres of land to 4,000,000 acres in England and Wales, he thought he might safely assume that of those 4,000,000 acres at least half were either water or barren mountain or rock, which it would be quite impossible to turn to any useful purpose. He now came to the proposition for the cultivation of all this waste land. Mr. Jones's plan was, to build cottages, with farms of 20 acres attached to each, on the good waste land of England, wherever that might be found. From an estimate published in the Royal Agricultural Society's *Journal* it appeared that cottages might be built at £87 apiece; but, as that struck him as being rather a high figure, he would assume that the actual cost of the cottages, under the plan in question, would be £50 each. Here they had, then, on every 20 acres an expense of £50 at once. He had gone over Mr. Smith's calculations of

the expense of reclaiming waste land, and he found that the highest estimate was £18 per acre and the lowest £6, the latter having reference solely to the growth of grass. This latter estimate would on a farm of 20 acres give an outlay of £120 for reclaiming, which, with the £50, would bring up the expense to £170. Further, there must be something to buy tools with, unless indeed these farmers were to scratch the ground with their fingers. So that, according to a very moderate estimate, to settle these people, who were supposed to be surplus labourers—he did not admit that there was any surplus labour—to settle all these people on the waste lands would require an expenditure of £200,000,000. (Hear, hear). Moreover, Mr. Smith calculated that such land when it had been reclaimed—an operation which in time would require a minimum of four years and a maximum of six—would yield a rent of only about 15s. per acre for pasture, but not a single quarter of wheat or even barley. (Hear, hear). These observations were addressed to men who were well acquainted with such matters, and who could correct him if he were wrong; but if, on the contrary, he were right, it was desirable that these facts should be made known, in order that the mistaken views of rash though well-meaning men might not mislead the public, and especially the working-classes. There was a time, no doubt, when the reclamation of the waste lands of this country was an object of great importance; but after the lapse of a period of fifty years, during which agricultural improvement had been stimulated to so great an extent, by skill and enterprise and increased demands, there was, he believed, only a comparatively small quantity of waste land, the reclamation of which would yield any considerable return. No doubt there was still a great deal of land of that description which it would pay a man residing in the district, willing to rough it, and understanding the matter, gradually to improve and bring into cultivation; but those who knew what cultivation really was, and how long it took to make an agricultural labourer, would easily conceive what would be the effect of taking a man who had been accustomed to work in a smith's or a carpenter's shop, placing him on a wild moor, and holding out to him the prospect that at the end of four or six years' incessant labour, and with the assistance of such an outlay as he had mentioned, he would have an estate worth £20 or £22 per acre. (Hear, hear). Again, Mr. Jones said, that our aristocratic system, by confining the land to a few persons, kept down the labourers. Now, it would so happen that on crossing the channel, and visiting that country of which they had so eloquent a representative among them in the person of Mons. Trehonnais, they met with the exact reverse of the state of things here. In this country the highest degree of cultivation that agriculture had ever seen had been attained on those great estates where the landlord, going hand-in-hand with the tenant, had given him security of tenure, and entering into a rational kind of partnership with him, had enabled him to develop the capabilities of the soil. But across the channel they saw a country where no landed aristocracy existed, and where the tenant lived, as it were,

by his own labour and that of his family, making use of only the simplest tools; and he could testify from personal observation, that the peasant-proprietor in the northern parts of France lived very much worse than the ordinary agricultural labourer in England (Hear, hear). If you were to ask the English smith or carpenter to live as the French or Flemish peasant lived, to work out of doors to the same extent, to wear the same kind of clothes, or to subsist in the same manner on soup, into the composition of which very little meat entered, he would treat you with contempt, and would tell you that you wished to reduce him to a state of absolute pauperism. He would go further, and assert that if the system of cottage farms proposed by Mr. Jones had been carried out on the reclaimed lands in Norfolk and Lincolnshire, those lands would ultimately have been again abandoned to the region of waste (Hear, hear). He had to apologise for making these remarks, but he could not refrain from endeavouring to show theorists, by a few plain facts, that it was not by turning skilled mechanics into bad farmers that they could hope to benefit the working classes (cheers).

Mr. SHEARER (of Swanmore, Hauts), in denial of there being any surplus mechanical labour, wished to observe that in a southern agricultural district of England, in which he resided, there had for the last two or three years been such a scarcity of skilled carpenters, bricklayers, and other artisans of that kind, that farmers had been obliged to forego many alterations and improvements which would otherwise have been made.

Mons. R. de la TREHONNAIS (of Falmouth) rose to corroborate what had fallen from Mr. Sidney in reference to the cultivation of the soil by labouring proprietors; and he hoped that what that gentleman had said would tend to check the unfounded hopes which democratic orators excited in the breasts of labourers on that subject. In his country (France), the sub-division of land had formed a great impediment to the improvement of agriculture. To such an extent, indeed, was this the case, that the French Government, having lately voted £4,000,000 sterling to be advanced by way of loan for drainage purposes, were at a loss to carry out their design, because they could not do so in such a manner as to ensure permanent benefit to the country. The large landed proprietors, who were few in number, thought it derogatory to their dignity to accept Government assistance in the matter; while as regarded the mass of proprietors, their estates were so small in extent, that it was almost impossible to conduct draining operations on a sufficiently extensive scale to be of any public value. There must, of course, be an outfall for the drains; and when an estate was about to be drained, it often happened that the work could not be done because the owner of the adjacent land would not allow his property to be interfered with. With such a limited area to drain, it was in many cases necessary to forego draining operations entirely; any extensive scheme for draining land was, under such circumstances, almost necessarily abortive. He happened to be engaged at the present time in forming in France, with the appro-

bation of the French Government, a Land Improvement Society; and when he applied to English agriculturists for advice on the subject, he found it almost impossible to make them understand the difference in the position of agriculture in the two countries. Such, indeed, was the state of things there, that it was almost impossible to carry out improvements on an extensive scale, except on Government property and property belonging to parishes. While population was increasing, the art of cultivation seemed rather to be on the decline; and he had no doubt that the price of grain in this country was 5s. higher than it would otherwise be, in consequence of the demand from France (Hear, hear). Considering that agriculture, especially in the southern parts of France, was in such a favourable position as regarded soil and climate, it was a lamentable subject of reflection to himself that his countrymen should be obliged to come to this small island to supply the deficiency in the food of the population. Having been enabled, by a residence of many years in England, to appreciate the great enterprise and skill which had been brought to bear on the cultivation of this island, he felt exceedingly anxious, as a Frenchman, to see the agriculture of his country similarly developed; and he trusted that a better day was dawning for the agriculture of France.

Mr. J. C. NESBIT (of Kennington) thought the operations described by Mr. Smith were more applicable to that part of the West of England which was mountainous and rainy than to districts of an opposite character. It might be taken as a general fact with respect to all the western districts of England, including the waste lands, that lime was a necessary ingredient in the cultivation of the soil. Paring and burning would generally not avail without the application of lime. There were veins of limestone in many districts; but, generally speaking, the west country was deficient in that substance. In the western districts of Cornwall and Devon, farmers, having no lime of their own, had obtained a supply from the coast, in the form of shell sand, and the importation of this substance having been carried on for a great number of years, and on a very extensive scale, there was now in many cases an excess. Mr. Smith had recommended a course of rotation, viz., that of taking turnips, turnips again, then seeds, and so on; and only taking a corn crop, he thought, in the fifth or sixth year: and he subsequently mentioned a rotation in which the corn crops would come together, preceded by three green crops. Now it struck him (Mr. Nesbit) that this would be rather receding from the four-course shift, which gave two crops in four years, and extending the period. As at the present time the grand point was to grow more corn within a given time, he would suggest that for three green crops and two corn crops it was desirable to adopt a rotation of this kind—turnips, next wheat or barley, then seeds, then wheat, then barley. Thus they might have in many districts of the country a rotation of five crops, consisting of three corn crops and two green crops. By using artificial manures they would be able to apply the requisite stimulus, and by taking barley after wheat they would secure a better sample of barley. He happened to mention this subject

the other day to one of the chief of Lord Leicester's tenants. This gentleman told him that when he was dining with Lord Leicester a short time before, his lordship asked him why he could not grow more corn than he did under the four-course shift? The next day he wrote to his lordship to ask him if he might grow barley after wheat, and his lordship gave his consent. He then put in 80 acres of barley after wheat, and the result was, as he informed him (Mr. Nesbit), that the barley proved the best sample that he had for a long time had. Supposing that they had succeeded in reclaiming waste lands, he thought the next great object was to endeavour to grow a large quantity of corn, an increased supply being manifestly required for our own population. There were some kinds of waste land which were not alluded to by Mr. Smith; such, for example, as the sandy lands between Brandon and Thetford, and which it seemed scarcely possible to reclaim. Lands of that description seemed fitted for nothing but rabbits and natural grasses. There was also a species of waste land near London which it would be very difficult to reclaim. There was, for example, the land about Bagshot. There they had sand alternating with thin beds of clay, this clay varying in depth from three to four feet, and not being of a good description. The cultivation of land of that description had been attempted by a great number of practical men, and he had seen scores of acres banked up and afterwards abandoned. It was, however, a curious fact, that when the labourer put his spade into land of this kind, he almost invariably succeeded in turning it into good potato ground; and the question arose whether, though it was not worth the money-while of farmers to cultivate such land, it was not desirable to make allotments of it to labourers, whose industry would stand in the place of capital (Hear, hear). He believed there was not such a large extent of waste lands reclaimable as many supposed. The high lands of Yorkshire and Lancashire were at an elevation of nearly 2,000 feet above the sea, and it was almost impossible to suppose that they would ever be clothed with anything but heather; and though there might be other districts in which the reclamation of waste lands was more practicable, he thought there was a very large quantity of waste land that could not be cultivated profitably.

Mr. B. WEBSTER, having been called upon by the Chairman, said he so entirely coincided in the remarks of Mr. Smith, that he had really nothing to say beyond making the declaration of his concurrence in them.

Mr. SCOTT (of Charing Cross) had had a great deal to do with the reclamation of waste land, sometimes at his own expense, sometimes at the expense of others, and he could certainly corroborate from experience Mr. Smith's representation that it was a very up-hill battle. That was especially the case when you had to contend with land-owners who were not sufficiently sensitive of the advantages which they would derive from such reclamation. Some years ago he was brought into close contact with a gentleman who was well known in Cheshire as the owner of a good many thousand acres of land; he referred to Mr. Warburton, of Harley Hall. The reclamation

which he (Mr. Scott) attempted on a portion of that estate was of a very peculiar kind. A good deal had been said that evening about high elevations. There they were on a very low level. Having gone into that district from the Lothians of Scotland with a strong feeling in favour of agricultural improvement, and with the eager spirit of youth, he determined to try what he could do on what might be considered a continuation of a well-known waste called Whitley Rede. He introduced into Cheshire a system of draining for which he had the honour of receiving a silver medal at the hands of Mr. Mark Phillips, and a similar acknowledgment from the Earl of Derby. Having a sort of instinctive perception of what was coming from Mr. Parkes, and not dreaming that Mr. Webster would go back as regarded depth (laughter), he determined, with regard to this land, not to adhere to the old standard of 2 feet or 2 feet 6 inches; he went 3 and 4 feet, cutting the drains in some cases with shoulders, and the expense of draining 300 acres was £5 an acre, and with other expenses about £7 an acre. Some account of his draining operations would be found in "The Farmer's Magazine" of 1843 or 1844, and also in the transactions of the Manchester and Liverpool Agricultural Society's Reports. In the first year he took potatoes off the boggy land, and having bought a ton of guano at Liverpool, at £25, and applied it at the rate of 2 cwt. per acre, the result was, that he got twelve tons per acre of magnificent potatoes. Having been told by the person who bought them that these potatoes turned to glue (laughter), he learned a lesson from that. In growing potatoes the next year, he used rape-dust in the proportion of 7 cwt. per acre, and he got £3 per ton for them. After this he sowed oats and Italian rye-grass, and he thought this latter crop was equal to any that he had seen in England. Well, Mr. Warburton, like many other owners who have to bear the whole burden, began to cool on agricultural improvements. Upon this he (Mr. Scott) advised him to put down the cost to capital account, and endeavoured to persuade him that he was buying the fee-simple of the land, as it were, over again; but he was not satisfied, and seemed unwilling to proceed. One part of the land being then in Italian rye-grass, &c., he offered to take to it at 3 guineas per acre; his offer was accepted, and he cleared twice that sum per acre by his bargain, although Mr. Warburton had some scruples about taking so high a rent (Hear, hear). He kept 5 ewes and lambs per acre, which he sold at an average price of £1 2s.; they were all off the land by the end of July. He then got some Northumberland tegs, which were cleared off in September, and then barren cows were freshened on the land to the end of November. On the same land he had had 44 tons of mangel, and 37 tons of swedes per acre. Now his object in making these statements was partly to show what might be done with boggy land. He gave his own experience in this country; and others he believed would corroborate him on the subject. In Ireland he had seen much waste heathy and boggy land most profitably reclaimed. As regarded Mr. Smith, he was surprised to find, from his address that evening, that the more dis-

tant he could make the period of profit the better pleased he seemed to be (laughter). He reminded him of the words of Campbell—

"'Tis distance lends enchantment to the view"

(laughter), whereas, in his (Mr. Scott's) estimation, the whole end of farming operations and the spirit of the day was expressed in the words,

"Come, let me clutch thee"

(renewed laughter). What was the use of dissolving bones, as recommended by Liebig, except to ensure a more rapid realization of profit? The mode of proceeding which Mr. Smith advocated might be very good in theory, but it would be impossible to find practical men who would be willing to wait so long for a return. Why should he take two green crops, which yielded no direct profit, in succession? and why, after taking two such crops, should he debar himself from taking white crops? He (Mr. Scott) had himself lived in the West of England for three years, and he thought the result of what Mr. Smith laid down would be that the cultivator would leave the profit to be reaped by his successor. Such a mode of viewing the matter afforded rather a discouragement to those who were disposed to cultivate waste lands.

A MEMBER would be glad to know what became of the land of which Mr. Scott had spoken, after he gave it up.

MR. SCOTT replied that the greater part of it was now laid down as a dairy farm, and was let at a stiff rent to the son of a well-known farmer in Cheshire.

MR. BRADSHAW said he could bear testimony to what Mr. Scott had said with regard to the character of Whitley Rede, being well acquainted with it as a sportsman.

THE CHAIRMAN said it appeared to him that both Mr. Scott and Mr. Nesbit had lost sight of one of the most important parts of the subject treated by Mr. Smith, namely, the altitude of the land on which that gentleman had been making his improvements, and he must say he thought that would always be a serious bar to anything like successful corn cultivation, that land so situated could only be made profitable as stock farms; and that even as stock farms it could be more profitably employed as adjuncts to low-land farms (Hear, hear). For his own part, if he were living within twenty, thirty, or forty miles of such land as Mr. Smith was improving, he should be glad to have 500 or 600 acres on which to keep his young breeding-stock during the summer months, to be then removed to the low arable lands. In travelling last year through the hilly districts of Derbyshire, he was particularly struck with the evident improvements which had been made upon some of the high lands by drainage only, doubtless at great cost and labour, for he observed that much rock was mixed with the grass; but where the improvements were effected there was a wonderful difference perceptible in the value of the land. He was quite certain that if all such lands were drained as far as they were capable of being so treated, they would more than double

he quantity of stock which was now kept upon them, and so far would be very useful; whereas, at present, they were little better than waste (Hear, hear). He had seen the same results on some of the Yorkshire moors, and he believed a similar remark would apply to that class of land throughout the United Kingdom. He agreed with Mr. Sidney, that there was, in England, no really good land that was not under cultivation; and he was quite sure Mr. Sidney was correct in saying that it would be almost dooming men to transportation to give them small tenancies upon these hills. Mr. Sidney had certainly done good in showing the fallacy of such an idea as that (Hear, hear).

Mr. SMITH, in his reply, adverted to some of the observations which had fallen from Mr. Scott. He had offered to their notice a simple, rude plan, which, if they proceeded properly, tenants could carry out. True, they might rush to conclusions. For instance, they could grow wheat in the second year, if they chose, climate and other circumstances being favourable to their doing so. But he very much doubted, looking at the terms on the card, whether it would be wise to substitute corn for green crops, in the way which had been alluded to. Chalky, silicious, and calcareous earths required the admixture of marls, and the application of such extreme manures as the farmers of England were wont to adopt in times gone by. The question on the card was, What was to be done in future? and was there a better plan? He held that there was, because, in the days of our forefathers, when they redeemed the heath of Norfolk and the wolds of Lincoln, they had only chalk and marl to fix them with; and after that, they brought them into cultivation. The lands they did not treat in this way, they did not think worth reclaiming. There were, however, many hillsides which carts could not go upon, but which sheep might tread, and might then be brought into good cultivation. By the mode of treatment he had suggested, buildings would not be required under a period of four years, and the whole matter could be dealt with entirely as a commercial transaction. He could bear out what Mr. Scott had said, with respect to the reclamation of bogs. True, he had not seen such results as Mr. Scott described, but he could bear testimony to the fact that unreclaimed wastes were most inviting, because they might be immediately paraded, burnt, and artificially manured, and as many turnips grown upon them as they pleased by artificial means. If they rushed into extremes, however, in doing these things, they would find that the outlay would equal the return. As to bogs, he had drained several, and the results had been favourable. Dry lands were undoubtedly the most inviting for the growth of turnips at first, but when the moderately black soils—such as required to be subsoiled—were broken up and drained, the vegetable matter, combined with the use of lime, rendered them the most productive lands for roots and grass afterwards. The dry lands were at the same time more healthy for immediate use, and for the pasturing of flocks. With regard to the remarks of Mr. Sidney, of course he (Mr. Smith) did not propose that the artisan should quit his warm shop in order to cultivate these hilly lands. The

men that were wanted for the purpose were the hardy men who lived in the neighbourhood, and who would take off their coats and apply their own labour to the land. In concluding, Mr. Smith moved the following resolution:—

“Resolved that, in addition to a judicious admixture, by which most soils have hitherto been redeemed, poor hilly lands would now be most effectually improved by the free use of artificial manures, including lime, and the successive growth of green crops to be consumed upon the land.”

Mr. B. WEBSTER having seconded the motion, it was put from the chair, and agreed to unanimously.

#### UNIFORM SYSTEM OF WEIGHTS AND MEASURES.

The CHAIRMAN observed that, before the club separated, he wished to make a few remarks relative to a subject which was exciting a good deal of attention at this moment, in his own neighbourhood especially, and he believed throughout the United Kingdom. He alluded to the necessity which was everywhere felt for obtaining something like a uniform system of weight or measure—he should prefer the weight—in selling their corn in the market. Under the present system, or want of system (Hear, hear), the difficulty which a man experienced in ascertaining the relative price of corn was so serious, and the confusion which prevailed so great, as to constitute a state of things that was almost disgraceful (Hear, hear). His attention had been called to the subject more particularly than by some gentlemen in his neighbourhood, who had requested him to mention it to this club, from whom they thought any recommendation would come with better grace than from any other body of persons in the country. He would, therefore, take the liberty of urging upon them the importance of each doing his best in his respective sphere, with the view of attaining the very desirable object referred to. They might then, on some future and not far distant occasion, take steps regarding it, that might be attended with some practical and useful results. In consequence of the many improvements which had, of late years, been introduced into farm machinery, a great deal of corn went at once into the sack, and was there weighed, not measured. And, this being the case, he thought that a uniform weight ought to be agreed upon (Hear, hear), though he would not take upon himself to say what that weight should be. But a meeting was held at Gloucester, a short time ago, at which it was suggested that wheat should be taken at 60lb. as the average weight per bushel, instead of 62lb., which was the standard at Birmingham and some other places. Now, 60lb. was, on the whole, he considered, a fair representative of a bushel of wheat, taking into account the average of seasons, and the average districts of the country. It was, also, the weight which was adopted under the Tithe Commutation Act, and, on that account, too, had a recommendation in its favour. Unless for tithe purposes, of course it mattered not whether the standard was 50lb., 60lb., or 70lb., because the price would be sure to adjust itself to any given

weight; but, as the arrangement to which he referred existed under the Commutation Act, he thought it would be unwise to disturb it by the adoption of any other standard for the sale of their corn.

Mr. SKELTON (of Sutton Bridge) said the question was one of very great importance, and expressed a hope that the club would lose no time in turning their attention to it. In districts where the system of corn-rents was in operation it was of especial importance to get at the real value of a quarter of wheat and other grain; and the only right way of doing that was to ascertain the natural weight of the grain, and sell it per quarter agreeably with that weight.

Mr. BRADSHAW (of Knole, Guildford) said that in his locality wheat varied from 59 to 65 lbs. the bushel, and that he himself was in the habit of selling by weight and not by measure.

The CHAIRMAN did not agree with Mr. Skelton that the measure should be adhered to. On the contrary, he thought they would simplify the purchase and sale of corn by having a fixed weight. They would then have only to determine the difference in value as to quality; whereas, if they sold by the bushel, they would first have to estimate the weight where no weight was given,

and after that the quality. Besides, he was informed by his friend Mr. Shearer that 60lbs. the bushel was the weight upon which all government contracts were based, and that all excess over that had to be paid for (Hear, hear).

Mr. SCOTT: In the Liverpool market wheat was sold by weight at 70 lbs. the bushel, and when oats were sold in that market they bought not a bushel, but 45 lbs. At the Chester market on the other hand they bought, not 70 lbs. of wheat the bushel, but 75 lbs.; instead of 45 lbs. of oats, 50 lbs.; and 84 lbs. of potatoes instead of 80 lbs. In fact, the whole thing was so complicated and confused that the buyer had nothing to guide him with regard to quality but his eye. Now, if they adopted the system which Col. Pasley, the author of "Equalization of Weights and Measures," described as the perfection of the heap measures, and sold their grain, as was done in the Edinburgh market, by attaching to the sack a ticket inscribed with the weight, and placing it in the public scale, then he would have an additional and still more satisfactory test of its value.

The subject then dropped, and the meeting separated, after a vote of thanks had been passed to Mr. Smith for his paper, and to Mr. Wallis for presiding.

## THE FOOD CRISIS IN FRANCE.

The prosperity of nations, taken in a general sense, or in any single instance of their moral and physical interests, is the last link of a concatenation of causes, all springing from a right principle. If the first foundation is unsound, whatever may be the patching-up of the superstructure, the whole fabric is a lamentable failure, and sooner or later must come down. But there is this providential peculiarity attached to public institutions and interests, that solemn and significant warnings are frequently given, to draw the attention of rulers and statesmen to the crazy systems which their genius may be striving to prop up and preserve. Happy is that nation which can boast of a sovereign or a minister with a sufficient grasp of intellect to discover the faulty link, the ailing root, and who can derive from his patriotism a courage sufficiently heroic; for nothing short of this is necessary to apply the proper remedy. Alas! such is the infatuation of men, that, terrible and disastrous though these warnings may be, the remedy prepared is generally applied to the visible and outward manifestation of the sore, and seldom, if ever, to its root.

The history of our own country is by no means barren of such examples; if, therefore, in this article we draw our readers' attention to what is taking place in a neighbouring and friendly country, we do not do so with invidious feelings of conceit and pride, but merely with the view of inquiring, as far as lies in our power, the real cause of that dearth and scarcity of provisions under which France is ailing—to an extent sufficiently alarming to excite the earnest and anxious solicitude of the wise sovereign who directs her destinies.

A prosperous and contented people is one of the most imperative necessities of Napoleon's reign; while it is undoubtedly the most difficult problem a sovereign ever had to solve; for that prosperity and contentment must not be only prospective, they must be immediate. It is not enough that the germs that are to ripen into the manifestation of these blessings at some distant period should now be laid in the enactment of wise laws and regulations, and the adoption of right principles; the multitude is swayed by those daily wants, which cannot be postponed; and hope, with all the alluring halo of its promises, is powerless against the cravings of a hungry people.

It must be borne in mind that the French government is perhaps more unfortunately situated as regards public calamities than any other. Rightly or wrongfully, it is ever held accountable for every kind of public suffering; to its rule is laid every kind of evil or distress that may occur in all matters of public interest or institutions. If food is dear, labour scarce, wages low, rent high, commerce stagnant, the money market tight, it is all the government's fault; and its popularity rises and falls with the relative prosperity of everybody's interest. The cause of this mischievous anomaly is, that since the great principle of legitimacy in the succession to the throne of France was destroyed by the catastrophes of 1789 and 1830, the opinion and fickle favour of a versatile multitude has been substituted for the right of birth, as the judge of ruling dynasties; and as a dire experience has proved that armies and bastilles are no security against the people's anger, once roused, the inexorable necessity of courting that multitudinous tyrant—the people's favour—sits

with the sovereign upon his throne, and becomes the first adviser of his crown.

After the revolution of 1848, that necessity created the *ateliers nationaux*—national workshops; and when they had grown into that frightful and ruinous nuisance which made their abolition a matter of unavoidable necessity, the insurrection of June, with its bloody street-battles, its barricade butcheries, its sacrilegious murder, imperilled the very existence of the power then constituted, because the disbanded workmen made it responsible for their disappointment, or their real distress.

To show the great difference that exists between this state of things in France and our own country, we need only point to the late meetings of unemployed labourers in Smithfield, and their processions through the streets of the metropolis. Much distress exists no doubt, but in those manifestations not even the shadow of a political blame is hinted at the Government. In Paris, such manifestations, unchecked, would have led them to fly to another revolution.

During the last few years, when the price of corn was comparatively high, and therefore bread dear, such distress existed in Paris that the government thought it advisable to interfere with the bread-trade, and compel bakers to sell their goods at a loss, giving them a compensation out of the public money belonging to their own municipality. We do not allude to this fact for the purpose of discussing its policy, but merely to show to what shifts—temporary, and therefore illusive remedies—the French government is obliged to have recourse, in order to silence the grievances and sufferings which every day, regardless of what was done yesterday, sternly ushers in with its dawn.

It is not only private enterprise that is tampered with, but commerce is arrested in its progress by a measure which the most simple tyro in political economy would pronounce as not only useless and mischievous, but as calculated to produce the very reverse of what it was intended to do. We allude to the prohibition of egress, at the frontier, of French agricultural produce, whilst free importation is allowed.

We read now in the papers that M. Fould, the confidential adviser of the Emperor, is gone to the South of France, with the view of ascertaining the causes which have led to the scarcity and dearth of food in that district. We know not whether the Minister of State will succeed in arriving at a right conclusion, or, if so, have the courage to describe it to his imperial master; but we believe that the cause is obvious enough, and, without fear of contradiction, may be safely ascribed to the neglect in which French agriculture has fallen, and the rude state to which it has been reduced through ignorance and want of capital.

In the southern provinces of France there are whole districts in which the implement which is represented to our mind by the word plough is altogether unknown; the soil is merely *scratched* by a pole furnished with a piece of iron at its end, and fastened, at an angle of 45 degrees, to a piece of wood, to which oxen are har-

nessed, and does the office of a share. The coulter is fixed by a wooden peg to another pole, and drawn by two oxen; so the whole forms two distinct and perfectly disconnected implements: the ploughman guides the one with his right hand, and the other with his left. Such is the state of agricultural practice in that part of the country; and if we except the northern departments and the neighbourhood of large towns in Normandy, with some of the central departments, and also the estates of a few landed proprietors who farm their own land, the whole of France may be said to be nearly on a par with the southern provinces.

Everywhere the most noxious weeds abound and luxuriate in full liberty. The fallow system which there prevails in the place of our root crops leaves the weeds in full possession of the land, without the single stroke of a hoe to disturb their hold. From a careful personal inspection, we have no hesitation in saying that full one-third of the cereal crops in France is destroyed by weeds.

Drainage is known only as a theory: a few spirited proprietors have indeed commenced operations, but as a general measure it is utterly ignored, and still less understood.

The protection in which the French iron-trade rejoices, and by means of which a few manufacturers are made to prosper, renders the use of that indispensable material a most costly luxury in the country. The fiscal laws which regulate the importation of foreign agricultural implements are so absurd and so vexatious, that both the buyers and sellers have seen the necessity of giving it up; so that the relaxation in the amount of duty which took place last year—that is, its reduction to 12s. per 2 cwt.—has proved a useless boon to French agriculture.

Setting aside all controversy about the respective policies of protective duties and free trade, we can nevertheless understand, to a certain extent, the plausibility of protection to home-flourishing industry; but upon what grounds can protection be defended when it is applied to an industry which has no existence in a country, whilst its produce is indispensable to the prosperity and progress of the most important and most vital interest of a community—agriculture? France has no Garretts, Ransomes, Crosskills, Drays, or Howards, to protect against foreign competitors: their implement makers are only village wheelwrights and country mechanists.

It may be argued by some, however, that the French government are doing a great deal. Look at the agricultural colleges, model farms, and farming schools, which since 1848 have been established in every district of France. Look at the agricultural societies in every town; consider the numerous shows that take place in every department, and the great ones in Paris; weigh in your mind the liberal prizes offered, not only to the exhibitors of the best cattle or produce, but also to the holder of the best-managed farm, &c., &c. All this is undoubtedly very good and worthy of praise, but nevertheless it is productive of little or no good, because these are remedies applied to the wrong end.

Let us take, for instance, the district agricultural schools. Let us suppose, for argument's sake, that the youth instructed there receive the soundest education, and come out first-rate agriculturists, in a theoretical as well as practical sense. What is the use, we ask, of these learned men in a country where the condition of the land to be cultivated is such that it is utterly incapable of receiving the application of the sound principles which have been taught to them? Agricultural science without an adequate capital is of very little avail where fields are overrun with parasite weeds, steeped in stagnant water, impoverished for want of manure—where the breeds of animals are slow growers, and still slower feeders—where the farm buildings are of the very worst description, low, ill-ventilated, or open to the four winds of heaven—where the implements are rude and inefficient, and where a duty coupled with vexatious formalities prevents the importation of those of foreign manufacture; especially where protection to the iron trade renders the use of that metal almost an impossibility. Science with such conditions as these is all but useless; and the very efforts which these agricultural doctors, furnished as they are with their diplomas, think it their duty to attempt, in order to enlighten the neighbouring natives, actually turn against the cause of progress. Such efforts are fatally abortive, and the jealous ignorance of the peasants finds in the miserable failure of this scientific agriculture a cause of triumph for their routine, which strengthens their prejudices, and encompasses the march of progress with fresh and more formidable obstacles. Then as regards agricultural societies and shows—the former seldom number a single tenant-farmer among them; those who compose them being landed proprietors or town tradesmen, utterly destitute of agricultural knowledge, residing in towns, and taking little or no active interest in agricultural pursuits. As to the shows, they only serve to

exhibit and render manifest the vast deficiency of the French breeds; and for want of terms of comparison with better races, they only excite emulation in routine, not in progress; for, with the exception of a very limited number of landed proprietors, there is scarcely one single farmer in France in possession of animals of improved English breeds.

Such are the true causes of the dearth of food in France. Population increases, and agricultural resources tend to diminish; for it is a lamentable fact that with all her advantages of climate, and the natural fertility of her soil, France yields little more than one-third of English produce per acre, whilst the acreage of her unproductive land is incredible.

The remedy is obvious. By voting the recent grant of one hundred millions of francs for drainage purposes, the French Government have at last hit the evil at the right place. The next question is how to apply this grant of money? We know that very strenuous efforts are now being made to establish in France a Land Improvement Society, somewhat similar to those which have lately been established in this country with such manifest results of usefulness and efficiency. This project, however, is not sufficiently mature to enable us to speak of it with any degree of certainty. Let us hope, however, that now the Government of France are on the right track, they will persevere, and bestow at last upon their long-neglected agriculture the boon of an enlightened legislation and commercial policy; as also furnish it with the means of developing the vast resources that lie dormant beneath the damp weedy surface of her rich champignons. Then, but only then, will her multitudes cease to hunger. Then, but only then, will contentment and gladness, steadiness and tranquillity, prevail, and close for ever the sluices of revolution and strife; securing, for the future, prosperity at home, and abroad peace and glory.

T.

#### MR. ISAAC'S PLAN OF A LABOURER'S COTTAGE.

Among many valuable articles in the number of the *Journal of the Royal Agricultural Society* just published, we are happy to see one devoted to the dwellings of the agricultural labourer. It is a lamentable truth, which we have adverted to more than once, that the condition of the labourer has deteriorated during the last century, while the cultivation of the soil has been improving, and our breeds of domestic animals have reached such a high degree of perfection as regards disposition to fatten and early maturity, that it has become a question whether advancement in that direction has not been carried as far, not only as is practicable, but desirable. The improvement of the rural labourer's condition forms one of the objects for which the Royal Agricultural Society was instituted, and is well worthy of more attention than it has received hitherto from that body. In this Society the influence of the owners

of the soil prevails so largely that it may be considered the House of Lords in our agricultural institutions, while the Central Farmers' Club of London may be held to represent the Commons. The condition of the labourer has not as yet received in the upper house so large a share of attention as so important a subject demands. In this matter the agricultural Commons appear to be taking the lead, for their list of subjects for discussion during the ensuing year shows two evenings out of seven devoted to the farm labourer. For the future we hope to see no number of the Royal Agricultural Society's *Journal* without an article devoted to this most important subject; important alike as an agricultural question and in a social and political point of view. It is to be hoped that the deliberations of these two agricultural bodies on this subject will be continued until the condition of the



farm labourer shall have reached such a state of improvement as that attained in other departments of British agriculture.

The clergy have been among the foremost to draw attention to this important question—to point out the wants of the labourers as well as their failings and their merits. If that body were called upon for suggestions, it cannot be doubted that many valuable contributions would be obtained.

But to the more immediate subject before us—the article by Mr. Isaac, of Terrace-walk, Bath, on the construction of labourers' cottages. It occupies but nine pages of the *Journal*, but in those few pages much valuable matter is condensed. The author commences with some remarks on the influence of bad dwellings on the habits of the inmates, which might be considered superfluous, if it were not unfortunately too true that there are close parishes where the clearance system is still in full activity, and where the labourers are driven to congregate in villages and towns as much as four and even five miles from their work. It is not the tenant farmers who do this; they deprecate it for their own sake, as well as for the sake of the labourers themselves. Starting, then, from the admitted principle that the first and most effectual method to elevate the labourer is to provide him with a comfortable house at a moderate rent, the author proceeds to offer a few practical hints and suggestions as to the manner in which this may be best effected. He commences with the axiom that the cottage of the labourer must be of such a character that it will be remunerative to the builder; for though many benevolent individuals have erected cottages, and let them at sums that scarcely pay 2½ per cent. on the outlay, it may be accepted, he says, as a general rule, that no lasting improvement will be effected in dwellings of this class unless they yield a remunerative interest. Taking this into consideration, and estimating that no labourer can afford more than a rent of £5 a year for his dwelling, and that investments of this kind should pay a gross interest of £6 per cent, he has endeavoured to curtail the designs so that the cost shall not exceed £85 a cottage. On this the editor remarks, in a note, that the estimate does not include that necessary appendage to the cottage of the labourer, a pigsty. The plainest of his elevations, the cottages being built in pairs, are very much in the style of the dwellings of factory operatives which we see in the vicinity of those establishments in which the mill-owners have studied the comfort of their workmen in their dwellings. To the eye of taste, the author observes, the elevations may not be deemed sufficiently ornamental, his principal aim being to combine comfort with economy. The introduction of gothic gables and verge-boards would, he adds, have been productive of a far more agreeable elevation, while he fears that by such an arrangement the comfort of the inmates would be lessened, and the expense increased; for these gables cause constant leaks, and the sharp gothic roof renders it necessary that the bed-rooms should be partially constructed in it, by which their cubic contents are

diminished, and ventilation rendered more difficult. His second elevation, with these additions, has certainly a better architectural effect; but as this is not for the gratification of the labourer, but of the landowner, it ought not to be at the expense of the former in his rent. It is quite enough if he puts up with these inconveniences in his habitation, which the author has pointed out as being entailed by this ornamental addition, in order to please the eye of others.

The cottages are proposed to be built in detached pairs, such an arrangement being both cheaper and warmer, with a quarter of an acre attached to each pair. This is certainly better than no land at all; but we can see no reason why this allowance of land should not be increased so as to give a quarter of an acre to each cottage. The author urges that the proprietor should never entrust the erection to the renting farmers, in consequence of the inadequate nature of the accommodation which the labourer receives when the expense of constructing his dwelling is thrown upon the tenant. So far we agree with him, but at the same time we contend that a sufficient number of dwellings for the constant labourers required for the cultivation of the land should be on the farm, and considered quite as much a part of the farm buildings as the barns and stables, and quite as much under the control of the tenant, though not provided at his expense.

With regard to the arrangement of rooms, these plans provide the essential requisite of three bed-rooms. They are all on a second floor, and no bed-room to be wholly or partially in the roof, nor to contain less than 500 cubic feet. In our hospitals the allowance is 1,000 feet for each occupier; in prisons and unions 500. In the arrangements of the ground floor he considers it desirable that the living-room should not open at once into the outer air, but should lead into a kind of entrance-passage or porch, in order to preserve the keeping room from draughts. The pantry is so placed that it does not communicate directly with the wash-house or scullery, in order that the food contained in the pantry may not be contaminated by the operations carried on in the latter. The well is placed under the back kitchen, in order to preserve the water from frost and to save labour in carrying it. The stairs are made to rise from the entrance-porch or lobby, so that the bed-rooms may be approached without passing to the living rooms.

For the economy of warmth, floors of wood are substituted for stone or brick. The ground floor is to be at least six inches above the surrounding soil; and in order to keep the walls of the cottage dry, the roof is to project six inches, while to economise heat the fire-places of the pair of cottages are placed back to back. The living-room is furnished with the Newark cottage-range; but others are mentioned as deserving attention. The principle of warming the bed-rooms by means of the fire on the ground floor is adopted, while by certain arrangements the contamination of the air passing through the flue is guarded against by providing that the heating surface shall not be of a deleterious character.

Arrangements are also made for sufficient ventilation. Into these and other details our limits will not permit us to enter, and we conclude by recommending the article, with its plans, specifications, and other details, to serious consideration. The time for action

has come, and that if the arrangement of these cottages are not perfect in all their details, they are at least a great improvement on the majority of the dwellings of the rural labourers.

## THE DRAINAGE OF THE METROPOLIS, AND THE DISPOSAL OF THE SEWAGE FOR AGRICULTURAL PURPOSES.

SIR,—The Committee of Engineers have opened their commission at Westminster; the question before them being an appeal from the decision of the Board of Works. It is of the greatest importance that a right and just judgment shall be pronounced upon this very important case; there never was an Act of Parliament that involved greater interests than the one in question, and consequently it requires every energy and intelligence to be brought to bear upon it. The engineers, it is to be feared, will only deal with it as did the Board of Works, viz., to *get rid of it*, by cutting a channel at the lowest level, and allow it to run away, under a sewer of bricks and mortar, and thus waste its invaluable properties in the Thames and the sea. But the agriculturist—the man of progress—differs in opinion to the engineer, and declares that the immense deposit and daily supply shall *not* be wasted; that the sixty thousand tons daily made in London ought to be appropriated to that use which the economy of nature so clearly points out, and which the common sense of the public so clearly agrees with. But time flies: the decision will soon be pronounced, and then it will be too late to complain. This decision will most materially effect the rate-payers of the metropolis in one of two ways. In the one case they will have to expend five millions of money on the project, and entail the same upon their posterity for generations yet unborn; in the other they will be benefited yearly to the extent of one and a-half millions. The former involves ruin and disgrace, the latter prosperity and honour.

It would be very unjust for me, or any man, to condemn any system except I had full confidence in another and superior one. Having, therefore, studied this subject for a period of 12 years, and carefully watched its bearing upon others, I feel sure that there is no way of properly dealing with the sewage of London otherwise than in a liquid state. It is said by Dr. Hawkesley, in a letter to Sir Benjamin Hall, that men of his profession derive useful lessons from the structure and economy of the human system, and he very justly observes, "We should assimilate the glands or tubes of man to the earth's surface, for the carrying away of the excreta and other used up matter." I so far agree with Dr. Hawkesley, but to go with him into his iron box and compost of cinders, earths, &c. I will not. Dr. Hawkesley forgets that we have already got the glands or glandules; we now want the life-invigorating sewage upon the earth's surface, that it may fructify and replenish the whole, "that our garners may be filled with all manner of stores, that our cattle may bring forth thousands and ten thousands in our streets."

Allow me now to introduce my system to public notice through the columns of your wide-spread journal. It has ever been the practice of men of science to cut up their matter into detail, and deal with atoms in preference to systems, of which those atoms form a whole. I will adopt this course with the hope of being best understood; and in dealing with the sewage of London in a liquid state, take the excreta of one individual in preference to two and a-half millions, the present inhabitants of London.

With this excrement—the produce of one day—I dilute it with a certain quantity of Thames water, the whole being one cubic foot, which would weigh 56 lbs., more or less. I take this to the top of my house, where is a 1½ pipe extending from thence to the boundaries of the metropolis in Essex, the farther end being lower by a few feet; this liquid, if poured in every day, would soon fill the pipe, and overflow at its Essex end.

I now extend this operation from the excreta of one individual to that of 208,333, being one-twelfth part of the inhabitants of London, and this would amount to something above 5,208 tons per day. Having fixed upon the Fleet Ditch for the operations, a reservoir is required to hold 466,666 cubic feet, this to be equally divided so that one shall contain 12 hours' supply, in which shall be introduced certain precipitants that will release all excreta held in solution; when thus settled down, the clear water to be drawn off into the Thames, leaving only the liquid manure of such consistence to enable it to float down the GREAT PIPE of 20, 30, or 40 miles in length. The next question will be the engine and machinery for raising this immense weight to the height of 60 feet in the working hours of each day. The engine requires to be about 20-horse power. The machinery I propose to employ is that of a large disc or wheel of 60 feet diameter, working upon its axle, of not more than 2 feet its extreme length; on the extreme of this disc shall be the cogs, which are acted upon by a pinion of about 16 inches diameter. On *each side* of this large disc or wheel are placed 36 iron projecting rods, which carry the same quantity of buckets or vessels, each containing 72 cubic feet, or 1 ton 16 cwt. As the disc revolves the upper bucket empties its contents into a cistern at top (B), which is connected with the PIPE SUPPLY, in a manner shown by the sketch accompanying this letter. By this means I calculate upon having one-fourth the weight upon the disc at one time, and 130 tons could be raised at one revolution of the disc or wheel, and with four revolutions per hour, making 520 tons, this at 10 hours per day, the amount of 5,200 tons, would be the quantity required, less 8 tons.

DISC OF 60 FEET DIAMETER, ON WHICH ARE SUSPENDED 36 BUCKETS ON EACH SIDE, HOLDING 72 CUBIC FEET, WEIGHING 1 TON 16 CWT.

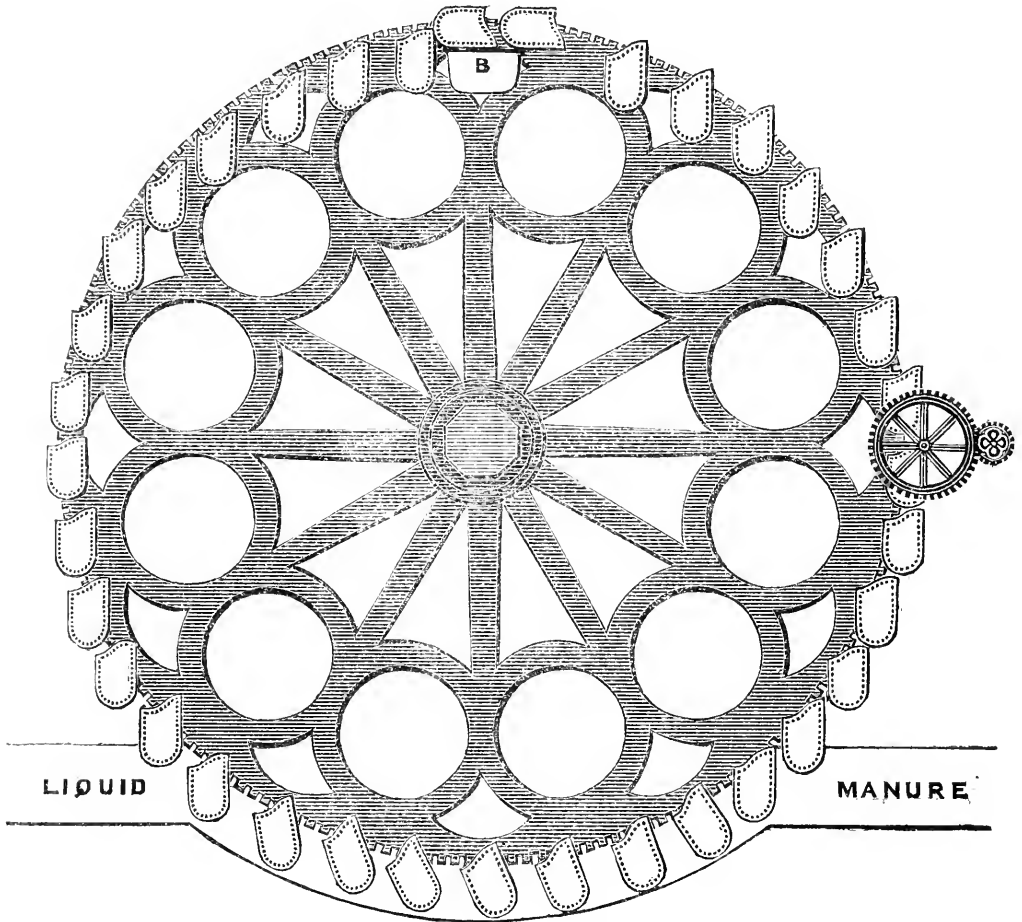


FIG. (B), THE TROUGH CONNECTED WITH PIPE SUPPLY.

I trust I have sufficiently explained my ideas in order that all your readers may judge of its practicability and effect; and should I have done so, there does not remain a single objection why this project should not be carried out, and thus appropriate to its proper use those thousands of tons of manure that is far, very far, before any guano that can be obtained.

I would here say a few words in reference to the Act of Parliament. The provisions of that act are that no sewage matter shall be allowed to find its way into the Thames, within a certain distance of London. Now I believe it will be impossible to comply with this clause, inasmuch as it will be necessary for the storm water to find its outlet as usual into the Thames; but as my object is to cleanse the river, as well as to intercept the daily supply of the sewers, there can be no objection, in the case of a purifying storm, to allow the same to go into the Thames, on condition that I collect the deposit thus made in forty-eight hours, or in other words, that I take from that deposit every week double the amount of its weekly increase.

I have said thus much on my plan, which it remains for

others to improve upon; many minds are now upon it, and as many propositions will be made. One thing is certain: here is a large amount of manure extracted from, and having the very germ of the plant which it is required to raise, whether it be wheat, barley, oats, beans, or any other grain: this manure possesses the properties and is capable of reproducing its original, and that in a greater degree than any manure yet known. The question as to the proper way of applying it to the land is of the greatest importance; and to arrive at the proper conclusion we must refer to Nature's law, and to what that law points out for the safety and benefit of God's creatures.

On this point I believe it will be admitted by all that the excreta from any body of inhabitants are most injurious and destructive to life when allowed to remain in the district inhabited; indeed, we have an instance and proof of this in our late wars. When the French and our own troops occupied Shumla, it was found necessary continually to remove the encampment to another locality, solely because the district became unhealthy from accumulations of excreta. If then this was found destructive to life by a

few thousands encamping in one district, what must it be where millions are stationed century after century? One inference only can be drawn—that London, from this immense accumulation, must be injurious and destructive to life while the nuisance exists. Two and a-half millions of people cannot be removed to other positions, we must therefore get rid of the nuisance; and to do this effectually and to a purpose, it is *only* in a liquid state it can be done. First, it is in this state that the law of nature points, because it would be impossible to collect it in its original state. Secondly, a certain quantity of water is required to make it a fertilizer. Thirdly, because that water destroys all nuisance, and neutralizes its injurious qualities. Fourthly, the water supplies the medium by which its transport can be effected without offence to the district or to the parties employed upon it. Fifthly, the water makes it available at all times and seasons to the crop. Sixthly, it is the only right way to apply manure to a crop. Seventhly, it is the most economical way, because it goes direct to the support of the plant, and each plant partakes of its properties in an equal degree. Eighthly, because it is only in a liquid state that manure can enter into the composition of a plant. Ninthly, because by its application in a liquid state and in showers the plant receives a large portion of air from the atmosphere, which it otherwise would not receive. Tenthly, the seed does not require a manure to produce germination, but only when it becomes a plant. But the points in favour of liquid manures are numberless, and in all a great benefit is derived from its application and use. The great question is, will this means be adopted for the cleansing of London, and thereby the fertilizing of thousands of acres around it? Will the present commission now sitting at Westminster take this view of the subject, and apply this immense deposit and daily supply of manure to the only purpose it can be applied to? or will they dig their nasty dirty ditch to Gravesend? Will they have the common sense to know the difference between the letting the sewage into the Thames at twenty inlets, as now, and the consequences of letting it in all at once at Gravesend? If they do adopt the ditch plan, it will be the early *grave* to many, and the *end* will not be until the system is changed. In a few weeks the plan for good or for evil will be announced, for next Saturday is the last day to receive plans or suggestions from the public. In the mean time it is the duty of agriculturists and their representatives to be upon their guard. Let them understand that one plan involves an expenditure of £5,000,000, and an annual outlay fearful to contemplate, while the other plan is productive of revenue of millions annually.

It is stated by high medical authority that the Thames now, as it is, is injurious to the health of the inhabitants on its banks. The evaporations from its muddy refuse gives off injurious vapours detrimental to the large mass of life swarming around it. What must this be then, if undiluted with water, running down this Upas ditch to Gravesend? for I defy the best man in the world to prevent the smell of this or any other channel of a similar nature.

I have now done all in my power to induce the agriculturist to take this most important subject into consideration. In his hands it becomes a source of wealth and a blessing to thousands: in any others it will become a source of ruin, of death, and a curse to London and its environs. I have avoided to speak of deodorization, knowing that it is all a fallacy, and quite as uncalled for as it would be to “gild refined gold, or paint the lily white.”

Does he wish to have some deodorized with a first-rate apparatus, let him make a few holes in an old pail, filling the same with some soil from his field, and by pouring on the liquid he will have the quantity deodorized and fit to carry into any drawing room. The truth is, the earth, the hungry soil, is the deodorizer. We all gave the Prince great credit for introducing his apparatus for the purifying of town sewage, and making it fit “to be set before the Queen;” why, he derived his hints from the book of Nature; he knew that a flower-pot filled with soil would do the same thing. I now leave the case in your hands, with the hope you will rouse up the dormant energies of the members of the Royal Agricultural Society of England, the farmers’ clubs throughout the length and breadth of the land, and the citizens and inhabitants of London, so that they may open their eyes to each other, and canvas their separate interests, and thus prevent the waste and misappropriation of one of the greatest mines of wealth ever yet discovered.

I am, sir,

Your obedient servant,

GEORGE PRATT.

London, Feb. 24th, 1857.

### PRACTICAL, HIGH, GOOD, AND CLEAN FARMING IN SOUTH LINCOLNSHIRE.

SIR,—I beg to say that I was, in and just after harvest last year, at Dyke, near Bourn, Lincolnshire. In looking with astonishment over the leviathan stackyards, full of gigantic stacks of clean corn, and admiring the cleanliness of the corn from weeds to the owner, a farmer of the first magnitude, living at Dyke; in answer to my admiration, he said, “I farm without weeds—I cannot afford to grow them. I grew this year, 1856, 200 acres of wheat, and I will show you my wheat stubbles; and if you can find a bushel of twitch upon the 200 acres where the wheat grew, I will forfeit you £5, and leave it to your own judgment. After harvest,” said he, “I set men and boys with flattened forks to dig up and pick out every bit or small bed of twitch that can be found upon the whole of my arable land where the corn grew: by so doing, I keep my farm as clean as a market-garden near the metropolis. I require no antediluvian dead fallow. I crop it hard and often, and manure it high and sufficiently with artificial manures, &c., and grow yearly a sufficient quantity or proportion of root and green crops, which I consider the mainstay of all good farming. I allow nothing to grow but what I put into the land—clean seed. I plough deep, and employ sufficient labour. I feed my land as well as my cattle and sheep, or the soil would get weak, poor, and hungry for the want of manure.” If good farming will not pay, bad cannot. If men half plough, half weed, and half manure their land, how can they expect to have whole or large crops, manure being the foundation of all great crops? And manure heaps require thatching quite as much as your corn stacks, to prevent the strength or essence being washed away by having too much water upon the manure. Many tenants are bound by agreement not to sell to go off their farms hay, straw, or root crops. Why not bind them down to preserve the black water, which is the essence of the hay, straw, or root crops when consumed in a farm-yard! At the same time, as a compensation, allow them a north Lincolnshire tenant-right, *alias* equity or justice, between landlord and tenant. And agriculture will never shine as it ought to do until it is so, for the want of tenant-right has kept agriculture so long in a backward and torpid state; and we need not wonder at it, whilst men have no security for what they lay out upon the estates of others.

SAMUEL ARNSBY.

18, Norfolk-street, Hyde Park, London, March 9.

## KENNINGTON AGRICULTURAL AND CHEMICAL COLLEGE.

## LECTURES ON THE GENERAL PHENOMENA OF THE EARTH, HAVING REFERENCE TO THE PRODUCTION AND MAINTENANCE OF ORGANIC LIFE.

BY CHARLES JOHNSON, ESQ., PROFESSOR OF BOTANY GUY'S HOSPITAL.

## No. XI.

"Animals grow, live, and feel." Feeling, which must here be limited to consciousness of touch, is always associated with our idea of animal life, and the presence of that faculty is only capable of being determined by the result of touch—motion: that is, *voluntary* motion. In the study of organic being, hence originates the greatest difficulty in deciding between the claims of the simpler or miuuter productions to animal or vegetable nature. How are we to define the limits which separate the movement that is voluntary from that which is purely the result of mechanical impulse? Every one who has been accustomed to microscopic investigation must be sensible of the liability to error under which he labours from this very circumstance; and, when we come to the discrimination between animals and vegetables on similar principles, the sources of such error are greatly multiplied. An example will illustrate our position. We are looking upon a little mass of some substance, the form and general appearance of which is unfamiliar to us; or, it may be a white thread-like body lying on the ground before us. The one, for aught we can determine at first sight, may be really what it appears—a lump of jelly, a morsel of fat, or a piece of maccheroni, dropped there perhaps by some passing bird who was carrying it away in its beak; the other may be a hair or thread, wafted hither by the wind. The first effort at farther enquiry is a touch: the jelly shrinks or trembles—the thread wriggles, or even coils itself. They are living animals! they feel—they are conscious of my touch. Such, at least, would be the ordinary decision of any unscientific person—of one unskilled in physiological enquiry; but only because the mind is more accustomed to note motion as an inseparable attribute of animal organization, while a parallel feature in the vegetable is apparently absent, and is biassed accordingly. The little gelatinous mass and the slender thread may be really animals, and animals too of essentially varied structure; for such have I in my recollection while thus describing. But do the observed movements confirm their being such? They are small and low in Nature's scale of being, and possess no striking external features beyond general outline, hue, and texture, by which their animal character can be traced, and all of these latter are common to the lower forms of both kingdoms.

Movement, excitable by touch, is not, however, exclusively an animal property. The Sensitive Plants close and droop their leaves upon the slightest provocation: those of the self-moving plant, *Hydrocharis gyrans* of India, are in constant gyrating motion on their stalks. The Venus's Fly-trap, *Dionaea muscipula* of the North American swamps, is equally apt at entrapping the insects which may chance to alight upon or creep over its singularly constructed foliage, as might be the most dexterous human hand, or the most active of spiders. But he who should assert that either of these vegetable productions belonged properly, in consequence of such manifestations of sensibility, to the animal kingdom, would be laughed at or regarded as insane. The vegetable habit, the green leaf, the flower, fruit, and seed, all capable of being recognized

throughout the series, are sufficiently indicative of the great class of being to which they appertain, and science and ignorance alike unhesitatingly refer them thither. But what becomes, in this allotment, of the self-moving faculty, the perception of touch, so decisive in other instances? Why, it has been replied, the Sensitive Plant, though it moves as if it were conscious of danger, is no more secure from injury than it was before the leaves closed together; while the *Dionaea* shuts its trap as readily upon a piece of wood, stone, or metal, as upon a fly or beetle. It is not, correctly speaking, feeling—not consciousness. These are only examples of an irritability appertaining to certain vegetable tissues, and which are necessary to the existence of plants under peculiar circumstances: they are in no degree analogous to the animal attribute they so obviously resemble.

It would occupy too much of our time to pursue enquiry at length into all the facts connected with this subject; but it is necessary further to observe, that no trifling amount of doubt attaches to the universally acknowledged consciousness of many of the lower animals, so far as concerns the acts proceeding therefrom being dependent upon a different cause from that leading to the before-mentioned corresponding acts among plants. The Polype, which stretches its long flexible arms to seize a more distant prey than that which comes of its own accord to the leaves of the Carolina Fly-trap, is as liable to mistake the nature of that prey as the unconscious bog-plant, and will swallow a fragment of a steel needle with the same eagerness that it does its favourite worm; while the boa constrictor of the London Zoological Society not long since dined or snipped upon his own blanket; and, although the stomachs of both animals may reject after a time the indigestible material, the seeming act of will in both instances is rivalled by the *Dionaea*, which retains the captive fly so long as a particle of moisture remains in its body, while it opens the prison doors upon the useless capture, exposing it to be washed off by the next shower, or blown away by the wind.

It is not then surprising, when the preconceived popular notions of distinction between plants and animals are found on examination to be established on such an equivocal basis, that the philosopher should mistrust even the evidence of his own senses, and cavil at the assertions of his brethren. The most sagacious and best-informed among us is but a groper after the needle proverbially hidden in the haystack. Hence we have the frequently-ennunciated dogma concerning "the animal kingdom ending where the vegetable begins;" and hence, too, the many equally plausible arguments, deduced from alleged facts, that the germs of one class of beings may, under different conditions, produce the species of another; or, that an interchange between animal and vegetable nature may, and positively does in some instances, occur in the same being during its progress to maturity. The works of the most eminent writers on natural science often teem with examples of this indeterminate generation of the lower grades of organization, quoted with all due gravity as results deserving credit,

or, at least, of unbiassed examination, by those who presume to doubt. A marked peculiarity of assertions thus put forward is, that in almost every instance they are founded upon a solitary fact, and that fact witnessed only by one person, or, if the observation has been repeated by another, the details are rarely accordant. It is not intended by these remarks to insinuate that the observer in either case is to be blamed for inaccuracy in his general statements, or considered as in any degree announcing as fact that which he has not seen or believed himself to have seen. Far be it from one, himself occupied in seeking out truth, and, like others of his class, often compelled to a temporary trust in probabilities, to ridicule or throw discredit upon the efforts of his fellow-labourers to elucidate natural phenomena, or to aid in the pursuit of any knowledge which may lead mankind to appreciate more fully the complicated machinery of creation. But the rapid conclusions that are too frequently drawn from apparent, but really mistaken, facts, have ever been among the most powerful obstacles to our improvement. Let the equivocality, regarding the correctness of all such surmises as those before us, be borne in mind by those who utter as by those who listen. Assertion does not make fact: the man who has seen an apparition may believe in its reality, even though his better judgment counsels differently; but he will probably find it difficult to instil a corresponding belief into the mind of another from whom the phantom has been withheld. So it is sometimes with the phantasies of science, and I am in the latter predicament: few are the instances in which different persons have seen the same ghost at the same time and under the same circumstances, a fact which tends to weaken the testimony of the most trustworthy witnesses; our natural history question has no firmer foundation.

There was a period in which the learned scarcely doubted the vulgar belief that the sky rained young frogs and lady-birds, when the sudden appearance in countless numbers of one or another of those well-known animals renders the ground alive and dark with the newly-transformed thousands of the little leaping reptiles, or covers miles of country with the crimson livery of the insect, clustering in profusion almost miraculous on every leaf and blade of grass. The tadpole antecedent of the one, and the larva state of the other, either unrecognized, or their metamorphic passages imperfectly understood, lent an air of mystery to both phenomena which the after-advance of natural science alone removed. Are we much better certified of the characters and conditions of the minor microscopical existences, than were our predecessors of the middle ages in respect to the foregoing and many other facts now so familiar to every school boy? And, unless we were so, our authority for speculating upon what occurs on the probable limits of the organic world, and the relative attributes of its two great classes, rests upon a basis too uncertain to warrant the assertion that what we see is, or rather is really accordant with the impression it makes upon our mind at the time.

To place in their proper light the assertions referred to in the above remarks, and the conclusions drawn from them by some philosophers, it will be necessary to have a few examples before us of the experiments or observations upon which they are based. The observers have been many, and their details are far too implicit and circumstantial to admit of any doubt as to their accuracy. The facts are, we may assume, indisputable; the inferences alone, questionable. Prepared by our previous examination of the subject, we may be enabled to estimate at leisure the true value and bearing of the first upon this important question; while, if they had come before us without this introduction, such is the apparent plausibility of the inference, that a person might be readily led to adopt the

views of the discoverers of these really startling truths, and thus be altogether unfitted to pronounce an unbiassed opinion.

The more active imaginations of some of our continental brethren, and the tendency of those of one school, especially, to indulge in researches to which our matter-of-fact idiosyncrasies are in some measure opposed, have led the naturalists of France and Germany to the foremost place in these abstruse inquiries. Among them, Bory de St. Vincent, Unger, Keiskek, and Kützing, rank as supporters, by argument and evidence, of the bold theory or doctrine of the spontaneous and indeterminate production of species among the lower grades of animal and vegetable existence.

A general statement of the creed of the transcendental naturalists may stand thus: A cell or germ once formed, may, under different circumstances, mature either as a vegetable or animal, and that without any limitation as to species. Thus the spore or seed of a conferva (a hair or threadlike aquatic vegetable), growing under certain conditions in the water, may either reproduce its own kind, or it may become an animalcule. The same spore, cast upon a dry rock, would vegetate as a lichen; falling upon dead or diseased organic substance, it might produce a fungus; while, taken into the stomach of a living animal it would become an intestinal worm. It ought to be remarked here, that the entire of these conclusions is not warranted by the facts themselves; but the latter are sufficiently surprising at first sight to account for the more exaggerated assumption. Mr. Franz Unger found one of the confervoid plants in question growing, near Vienna, in a ditch of clear water derived from the melting of snow, and watched its development by means of the microscope. Having minutely observed the formation of its reproductive germs and the manner of their separation from the parent plant, he was astonished at finding, that instead of floating quietly in the water or sinking at the bottom, as might be naturally expected of a vegetable seed or spore, each of them swam about, for the space of an hour, like an animal endowed with volition; nimbly avoiding others as they approached, or gliding around them, stopping, and again setting itself in motion. Towards the close of their hour of animated existence, the originally globular form of the spores became more or less elongated; each extended an appendage resembling a root, by which the young plant fixed itself to the side of the glass vessel containing the water, or to some other body with which it happened to come in contact, and, continuing to elongate, in about eleven days bore fructification in its turn, when the cycle of events was repeated as before.

Kützing, as quoted by Dr. Lindley in his "Vegetable Kingdom," asserts that in the cells of his *Ulothrix zonata*, another of these threadlike aquatics, there are found minute animalcules, with a red eye-point, and a transparent mouth-place; these bodies, however, are animals only for a time. Eventually they grow into vegetable threads, the lowest joint of which still exhibits the red eye-point. "This phenomenon," observes Dr. Lindley, "which Kützing assures us he has ascertained beyond all probability of doubt, puts an end to the question of whether animals and plants can be distinguished at the limits of their two kingdoms, and sufficiently accounts for the conflicting opinions that naturalists entertain as to the nature of many of the simpler forms of organization." Kützing appears to have pursued this subject with no small amount of perseverance, but the following experiment is certainly not calculated to enforce the opinion he would inculcate; because corresponding ultimate results would have been obtained, by placing a little rain or spring water under similar circumstances, without the preliminary decomposition of animal substance. He cut into pieces a species of medusa (one of those gelatinous, tranalu-

cent, marine animals so common on our sea-coasts, and known by fishermen under the names of sea-nettle and sea-blubbers). He washed the pieces carefully in distilled water, put them into a bottle of the same, corked it closely, and then placed it in a window facing the east. The bits of medusa soon decomposed, and a very offensive odour was the consequence; so long as the latter lasted, nothing particular was observed to take place; but when, after a few days, the putrid scent had passed away, myriads of monads (the lowest and most minute of animal forms yet recognized) made their appearance. Shortly after, the surface of the liquid swarmed with extremely small green points, which eventually increased so as to cover the whole surface; similar points attached themselves to the sides of the bottle; seen under a microscope, they appeared to consist of numberless monads, united by a slimy mass; and at last, after a lapse of several weeks, the *Conferva jugacissima* developed itself in perfection.

As already observed, regarding any supposed transition from animal to vegetable life, this experiment is unsatisfactory, explaining nothing, establishing no ground whatever for such belief. The very species of plant named as its result, is produced in an uncorked bottle of water exposed to light, and in every rain-pool that remains long enough for its development; the little green points, seeming monads, described as preceding its growth, being the spores from which it emanates. How the aporea are brought thither is mere matter of conjecture; whether dispersed at all times in the atmosphere, which their exceeding minuteness renders not unlikely, and only becoming visible during the preliminary expansion which is the commencement of their growth, as a seed swells before it germinates, or whether any more plausible suggestion may be adopted, no value can be attached to either, beyond that of greater or less probability: but the experiments and observations of the advocates of their spontaneous production must be classed under the same category.

The slime or mucus, so frequently accompanying the generation of these minute bodies, has itself furnished a curious theme for speculative enquirers, and some have even believed that in it we actually witness the earliest preparation of matter for animal or vegetable existence. Bory de St. Vincent suggests that "one might call it a provisional creation waiting to be organized, and then assuming different forms, according to the nature of the corpuscles which penetrate it or develop among it. It may further be said to be the origin of two very distinct existences, the one certainly animal, the other purely vegetable. The matter lying among the shapeless mucus consists, in its simplest state, of solitary spherical corpuscles; these corpuscles are afterwards grouped, agglomerated, or chained together, so producing more complex states of organization. Sometimes the mucus—which acts as the basis or matrix of the corpuscles when it is found in water, which is the most favourable medium for its development—lengthens, thickens, and finally forms masses of some inches extent, which float and fix themselves to aquatic plants. These masses are at first like the spawn of fish, but they soon change colour, and become green, in consequence of the formation of inferior vegetable corpuscles. Often, however, they assume a milky or ferruginous appearance; and if in this state they are examined under a microscope, they will be found completely filled with the animalcules called *Navicularia*, *Lunulina*, and *Stylaria*, assembled in such dense crowds as to be incapable of swimming. In this state the animalcules are inert. Are they developed here, or have they found their way to such a nidus, and have they hindered the development of the green corpuscles? Is

the mucus in which they lie the same to them as the albuminous substance in which the eggs of many aquatic animals are deposited? At present we have no means of answering these questions."

The principal difficulty to be overcome, in prosecuting inquiries of this kind, consists in the uncertainty attending all our estimates of phenomena in which the agency of life is concerned, owing to our utter ignorance of the power or principle it involves. So long as observation is confined simply to the comparisons of structure in different species of plants and animals, and to tracing the conditions of individuals as dependent upon its varied character, our road seems clear, our conclusions satisfactory. But in the question before us, the present limit of human comprehension seems to have been reached; and we must be content to pause awhile, patiently awaiting new capabilities, either from the improvement of our instruments of research and greater experience in their application, or from an extension of the reasoning powers by which that experience is regulated. Human progress has ever been slow in the aggregate, though occasionally it may have appeared, by a sudden leap, to leave all previous attainment far behind, and wrap the mind in astonishment and pride at its own unexpected advance. More than two centuries and a-half elapsed from the time when Galileo first directed his optic tube to the heavens, to that in which the elder Herschel discovered the distant planet Uranus; and then the astronomer who might have predicted that the circuit of the solar system was to become doubled in its known extent, while forty-one more planets were to be discovered within the life-period of a newly-born infant, would have been considered mad. Yet such has come to pass; more accurate observation of the realms of starry space, and the increased powers of the telescope, have effected this, and more, towards the enlargement of our sphere of knowledge. In like manner may the prospect of a closer acquaintance with the minor works of Nature be anticipated, if it is not already seen to loom in the distance. The range of the microscope is not more circumscribed than that of the telescope, though extending in an opposite direction; and although our present imperfect acquaintance with optical phenomena may assign bounds to the improvement of both, that those imagined bounds are not impassable the history of past discovery encourages us to hope.

Life is so far seemingly separated from any other power, of the existence of which we are sensible, that, like electrical and magnetic action—referred to a common source, but differing in some of their modifications—may be that which inspires vegetable and animal being. If so, the mutual divergence of the forms of both from one type may really warrant the surmised association of them in their lower grades. But such association is at present only surmise; and as the two mysterious agencies manifested in the lightning-bolt and the loadstone may merely resemble each other in that dualism of opposing forces in each which apparently pervades the universe, so may all our speculations terminate in an entire overthrow of all present views and theories based upon no more positive foundation. So may the knowledge we now congratulate ourselves on possessing prove equally mistaken and ridiculous as we now deem the crystal firmament of heaven under the old philosophy, contrasted with the boundless realms of ethereal space which constitute the modern idea of the universe.

I have thus commenced by opposing certain vague and undefined notions concerning the origin of organization,

and have no others to propose in place of them. So far, however, as the subject immediately before us is concerned, the question we have been discussing may be allowed here

to rest. The vegetable element, beyond a certain point, is pre-existent and subservient to the animal, to whatever period may be assigned eventually their relative origin.

### THE YOUNG FARMER ENTERING INTO BUSINESS.

The choice of his cattle will be the next object of the young farmer. This, I think, is not of quite equal importance to the choice of his sheep stock; I shall, therefore, merely enumerate our most popular breeds as adapted for general breeding and grazing purposes. I would, however, ask the young farmer to wait awhile before he becomes a breeder of cattle to any extent. A small farm is not well adapted for breeding both sheep and cattle. The latter require much food, and great accommodation. All the calves and yearlings must be provided with warm hovels and yards, and ought to be very carefully attended to: young sheep require much less attention, and will thrive well in open fields upon common food. I think it would be his best practice to purchase cattle annually for his fields and fold-yards; but if he desires to breed, and proceeds to a choice, then the most profitable English breeds of cattle are the pure shorthorns, the Durham and Yorkshire shorthorns, the Herefords, and the Devons. Besides these, we have the Sussex, the Longhorn, the Suffolk, the Shropshires and Welsh Runts. Any of these breeds produce profitable grazing animals; but for breeding purposes, the shorthorns, Herefords, and Devons, are to be preferred. I make a distinction between a pure-bred Shorthorn and the ordinary Durham and Yorkshire breeds; the latter, as a class, being somewhat smaller, and less expansive in frame. The former, or pure-bred cattle, have every qualification to make good and valuable animals. The Herefords approach next in frame and value to the shorthorn; and the Devons are smaller, but of excellent quality, and admirably adapted for moderate upland pastures. Either of these breeds may be adopted with credit to his choice; but the pure Shorthorn will gain the greatest size and weight of flesh in the shortest time, and of good quality. The Hereford comes next, and is of beautiful frame and proportions, and the flesh is of very superior quality. The Devons are smaller, but exceedingly symmetrical and handsome, and quality of flesh very fine and superior. The strength and richness of his pasture lands must chiefly influence his choice; the better land the larger and better cattle, for inferior land he should choose a smaller breed. For dairying on a small scale, either of the favoured breeds will do admirably; but they are not quite equal to the Longhorns or Suffolks as milkers. Animals best adapted for dairy purposes are not always good for fattening. The young farmer on this small farm will do well to select the breed that answers well for both the dairy and the field. For this the Shorthorn and the Hereford stand pre-eminent; the former, having latterly undergone greater improvement than the latter, is, I think, to be preferred.

His next business in selection will be his Pigs.

No class of stock is more profitable, under clever management, than this; and it is highly important that our young farmer starts well. The varieties in the breed of pigs are not to be numbered. The two great distinctions are usually denominated the large and small breed, but the subdivisions and crosses are endless. A pig of the *small breed*, at the late Smithfield Club Show, made £20 or £21 to the butcher. The distinction is chiefly in form and looks, rather than weight; but the large breed are invariably taken to weigh the heaviest. The small breed only occasionally arrive at great weights. The small breeds are of the best quality of flesh, and finer in offal, and make admirable porkers. The large breeds attain the greatest weight in the shortest time, but are coarser in the quality of meat, and are best adapted for curing as bacon. Their breeding properties are about equal, but the propensity to fatten is in favour of the small breed. To arrive at a correct decision, the young farmer must take into account his vicinity to a good market, and note which kind of meat is most in request at such market. The London trade will take off his porkers, if small; but some of the great shipping and manufacturing towns will best take off his large pigs. I therefore recommend him to adopt the large or small breed, according to his ready access to either the London or such large provincial markets respectively, where great weights are popular. The agricultural districts and country market-towns are generally the best customers for the large breeds, and will give as much per stone as for the smaller breeds; and as the large breed produce more flesh in the least time and cost, it is manifestly to the advantage of the farmer thus situated to adopt the larger breed; but if he farms in a pork-consuming district, he should adopt the small breed, as the price there given will more than compensate for the little difference in accumulating weight of flesh. Having decided as to the kind, his best course will be to apply to some respectable breeder of known repute, and obtain from him a stock of breeding sows. Three or four of these will soon bring him plenty of stock, as none of our domestic animals breed so fast; and he may be able, by good management and feeding, to sell some as porkers in a few months from the farrowing; but in general it is better to allow them a reasonable growth before fattening, particularly the large breeds, which in their early stages are quicker growers than feeders.

*Poultry.*—This at first sight appears a trivial subject to advise upon, but in reality it is not so. Good attention to the breeding and rearing of poultry is profitable, and deserves greater application than is commonly given to it. It is not desirable to keep too many varieties; it is seldom that all kinds of domestic poultry thrive well in the same yard. Geese and ducks do not agree well



in the same pond. Turkeys are great enemies to all other kinds of poultry; and even two distinct varieties of the common fowl do not agree together. The young farmer will do well to make a judicious choice of the *sorts* he will breed, in which he must be guided by the facilities his farm-yard gives, and then proceed to the selection from the best well-known stocks. This is no easy task to do correctly, for he will find sub-varieties in every sort—in geese several, in turkeys several, in ducks many, in fowls innumerable. As a general rule, and with a view to the greatest profit, he should select the larger varieties of the sort he has chosen to keep. The only recommendation I would give on the point is to be very cautious relative to the introduction of the many new varieties lately brought into notice—such as the Cochín China, Polish, Spanish, and the like. The large Dorking is superior to them for the table, and the everlasting layers are equal to them for eggs. Peafowls, guinea-fowls, bantams, &c., look ornamental in a farm-yard, but are not profitable. It may occasionally answer remarkably well to breed *fancy poultry* exclusively; such are sold to poultry fanciers, amateur breeders, and the dealers in breeding poultry. This, however, is not the common legitimate business of the young farmer. His business is to produce food for the community, and he must choose his breeding-stock accordingly, and it is his to prepare them for the general market.

It is not my intention in this series of papers to advise the young farmer as to the conduct of his business or the management of his stock; this I probably may take up subsequently. My present design is to advise him as to his course upon entering into business, and to guard him against error in various ways in his first efforts. It would also prolong these papers beyond reasonable bounds if I essayed to advise upon the choice of his varieties of grain, roots, &c., or of artificial grasses, food, or manures, &c.; these would form better subjects for discussion in giving advice upon general management. My next object will be to offer some words of caution and advice, with the view to direct his choice in the selection of his implements. This, in the present day, is a very difficult task, as the improvements made in this department of agricultural progress have, perhaps, exceeded all others; and the implements are so good, and so many, and made by so many manufacturers, that to name any one implement, or any one manufacturer, seems invidious, and as something derogatory to another, where the merits are so great and so equal both in usefulness and manufacture.

*The Choice of Implements.*—These I have already enumerated in my particulars of estimation for the amount of capital required, and the number and kind of implements to be selected. It is for the young farmer to weigh well the cost and capabilities of each kind, as catalogued before him by the different makers. It will by no means do to take the decision of judges—or, in other words, prize implements—to be correct, as being best adapted for his occupation. It may be good as a general rule, but he must look for those implements which will most effectively cultivate the soil he has to

deal with. A heavy-land implement is too cumbersome and expensive for light land, and *vice versa*, &c. We will take first the implements for culture, and in the choice of these lies the greatest difficulty; not in making a good selection, for that is easy, but in making the right, the best selection.

To begin with *Ploughs*.—How, from amongst so many and such eminent makers of ploughs, shall he be able to select the best? Why, we say at once, he cannot. He must exercise his own taste and judgment, not forgetting cost and simplicity in construction. Where the merit and capabilities of the implement are so equally balanced by the skill and talents of different manufacturers, it must be merely a matter of taste in making a selection. The kind of plough is another thing, and he must choose one according to the tenacity or freedom of his soil. For light land, a light-land plough; for heavy land, a heavy-land plough; for medium soils, “the best plough for general purposes.” I would venture to recommend that the plough be of iron—*i. e.*, wrought-iron beam, with cast-iron body and share, and steel mould-board. The plough to be of the simplest construction, so as to form either a swing or wheel-plough, to be used with one wheel to regulate the depth; but not two wheels, to regulate depth and width too: this adds to the cost, and to the idleness of the ploughman, without lessening the draught of the plough. It would be acting judiciously to pay a visit to the manufactories of those plough-makers most in repute in the district in which his farm is situate, before he decides upon a choice. Good and effective ploughing is the foundation of good husbandry; therefore a good and easy-going plough must be selected.

*Harrows.*—These implements generally stand next in every catalogue. The varieties in harrows are equally numerous with the class of ploughs. The same general rule will apply: light-land harrows for light land, heavy-land harrows for heavy land, with occasional deviations; light land will at times require heavy harrows, and *vice versa*. I think the prevailing fault on this point is in selecting harrows of too light construction: land requires thorough working or high pulverization; light harrows won't accomplish it. Select them of sufficient weight, made of wrought-iron, with plenty of teeth, every tooth taking a different track. Those made in sets are to be preferred, so as to fit the “land,” or “stetch”: a set of three to take a six-foot stetch, or a double set for a twelve-foot stetch, with seed harrows to match. This would permit the horses to walk in the furrows, when requisite. The teeth should be of sufficient length to prevent clogging in work. A set of strong heavy harrows for rough-fallow work, to follow the cultivator, is very desirable.

*Cultivator, or Scarifier.*—This is a class of very valuable implements, which no good farmer can do without, or avoid using. The varieties are many. Those most effective in work, simple in construction, and economical in price, are to be preferred. But the adaptations of these implements are for various purposes. Those possessing several and the most effective combinations are most valuable for general use. A good cultivator or scarifier (for the implement is nearly the

same) ought to be able to pare the soil at any shallow or given depth, and to break it up at a great depth; to work readily through beds of twitch; to cut or tear the whole furrow-sole, and slice, and effectively move the soil in loose fallows; and if capable of conversion into a subsoil pulveriser, all the better. I have not yet seen any one single implement qualified to effect all the above purposes. One is superior in one department, and another excels in a different position; a good parer does not excel in rough fallows, and *vice versa*.

*Field Rollers, or Crushers.*—These are implements of great and increasing importance. Rolling and crushing are more practised than formerly, not only in fallow work, but in pressing and levelling grass lands, and to aid growing crops. The right choice of this expensive implement is worth much consideration. The varieties are very numerous. The serrated clod-crusher is admirably adapted for breaking large clods into smaller fragments, but it is not equal to the plain roller for crushing and crumbling them into dust, which all farmers find so generally necessary in business. The grooved roller is very effective for rolling corn crops, and is also highly useful as a general field roller. Both the serrated and grooved rollers, and some plain ones, are made in sections, or a series of wheels or discs, which are variously arranged, with bosses and otherwise, to prevent clogging in work. This mode of construction in disc sections is objectionable in some points; occasionally the whole weight of the implement is brought to bear upon a single disc or section, as in meeting with a prominent clod or stone: the danger from breakage in this case is great. There are also many fanciful inventions for breaking, crushing, and even cutting clods; and for the better pressure of corn crops: these are all very well in their places, but I would recommend our young farmer to avoid anything fanciful, and to choose that roller which appears to him best adapted for universal service upon the soil he cultivates, and comparatively inexpensive. The diameter should be rather large, or it will work heavily, and the plain rollers should consist of two or more cast-iron drums or cylinders. The cast-iron rollers are to be preferred, as distinguished from the common wooden roller. A single field-roller, or crusher, ought to suffice for our young beginner's farm of 200 acres; he should be therefore careful, we repeat, to select one suited to general purposes.

*The Drill.*—This, in all its adaptations, is a very costly implement; and yet it cannot be dispensed with, as row-culture possesses so many and such great advantages. The great thing for our young farmer to consider is, the various and specific uses to which he intends to apply his drill. If he propose drilling in manures with his corn crops, at narrow intervals, he will require an expensive implement; but if he circumscribes his manure-drillings to his root crops, he will only require three or four spouts and coulters, with requisite troughs, which will lessen the expense very considerably. It would be folly to buy a drill for any specific purpose, as they are manufactured with combinations so general that they may be used for every crop. I should again recommend our young farmer to

look to simplicity in construction, its adaptation to general uses, and price.

*OTHER FIELD IMPLEMENTS.*—The *Horse-hoe*, for corn crops, is expensive, and I think not very profitable, management: the hand-hoeing is better for the crop. The *Ridge-hoe*, for row-culture, he must have. He must have several combinations in this implement—*i. e.*, for ridge-hoeing, for moulding-up root crops, paring, skeleton ploughing, broadsharing, &c. *Drag-rake.*—The new lever-rakes are best: the teeth should be long, and the lift high and easy. *Spades, Shovels, Hand-hoes, Hand-forks, Manure-forks*, should be purchased of Sheffield or similar manufacture, particularly the forks having steel tines. Miscellaneous articles, such as reaping-hooks, hedging tools, carpenters' tools, &c., &c., I need not stop to advise upon.

*CARRIAGES.*—*Waggon.*—For delivering corn at any distance, it should be of light build, and of perfect workmanship and material. To have iron arms, or patent axles, with raves, fore and hind-ladders (both moveable), wheels of somewhat large diameter, and shafts either for double or single harness. *Carts.*—These should be adapted for a single horse, and be of sufficient capacity for harvest work, fitted with moveable shelvings and side-boards, and running on iron arms with patent axles. For hilly districts, they must be fitted with either break or drag-chain. The varieties of manufacture and pattern in getting up common farm carriages is great, and very attractive. Our young farmer must take time, and by no means make a hasty choice. His object must be, to obtain them light and durable, and not costly; and he should avoid much that is ornamental, as adding to the expense. I name this, as it is often a great point to show a handsome carriage, &c., &c.

*HARNESS.*—The fashion and make of farmers' horse-gear differ in almost every district. The heavy, unsightly, and expensive gearing of some localities is much to be deprecated. They are almost load enough for a horse to carry, without work, for the day. Choose light *Bridles*, with single bit; *Cart-saddles* not large, but of good form, and strong breeching; the *Long Gears* of strong chains, with a rather broad back-band and strong belly-band, and no superfluous back-atrap, crupper, and hip-straps; the *Plough Gears* with simple back-band and chains, with ringles, not hooks; the *Collars* light, and of black leather, well stuffed; the *Hames* and *Fill-hanks* strong, but not too long, and fastened with leather thongs, not chains.

*YARD IMPLEMENTS, &c.*—*Cake-breaker.*—The simpler in make, the better, if it will break for cattle and sheep. *Turnip-cutter.*—*Ditto*, if it will cut for cattle and sheep. *Chaff Engine.*—I am inclined to advise our young farmer to obtain one for horse-power. It is expensive; but the economy of cutting food for all kinds of stock will amply repay him. It is important to make a good choice. The form of knife and method of feeding in the box are great points for consideration. *Bean-crusher or Bruiser.*—This is a very desirable implement to have; but it may be dispensed with. The nearest mill can be employed for grinding. *Cattle-*

*cribs*.—These should be of oak, with full or closed sides and bottoms. *Pig-troughs* should be either of stone or cast-iron. The many sundries I pass over, and proceed to

**THE BARN IMPLEMENTS.**—*Dressing Machine*.—The manufacture of corn-dressing machines has so greatly improved, and their adaptations are so perfect, that I dispense with the blower. This is an important implement for the farmer's use, as the perfection of his sample is of great moment to him. I should recommend our young farmer to choose the best, if possible, regardless of cost; and he must take care that its com-

binations are sufficient for dressing his seed as well as his corn crops. The *Thrashing Machine* I pass by, as being too expensive for a farm of 200 acres. The minor barn-requisites I need only name—bushel-riddles, chaff-skeps, scuttles, shovels, sack-barrow, and sacks. I have only to name, in addition, some field and yard requisites, *i. e.*, rick or thrashing cloth, ladders, barrows, grinding-stone, hurdles, sheep-troughs, crow-bars, stone and turnip-picks, water-troughs, buckets, butchers' requisites, carpenters' requisites, &c., &c.

## FACTS CONCERNING THE WORKPEOPLE OF EUROPE.

We now come to what we call *the momentary system*, or the perfect freedom of the labourer to invest his physical capital in the best market to be found. Where the generous spirit of employers induces them to calculate *how much* they can give to their work-people as payment for toil, rather than *how little*, this system is perfectly safe both for the individual and the community. But where this is not the case, the system is dangerous. Equality ceases. The capitalists become pretty much dictators in the labour market, and the workmen sink to the rank of slaves—a very unprofitable and combustible element in the community. We defend this assumption on the recognized principle that virtue is essential to the success of a popular form of government, while it is not to a despotical or monarchical government. It is necessary that if the people make the laws they must keep them. Where the person intrusted with the execution of the laws is sensible of being himself subject to their direction, there must be eminent need of virtue. If in a republic virtue is not found, ambition and avarice possess the community, and the State is undone. “The politic Greeks,” says Montesquieu, “knew no other support but virtue. The modern inhabitants of that country are entirely taken up with manufactures, commerce, finances, riches, and luxury.” And we have a practical exemplification that they are undone. There was not enough virtue in England to maintain the Commonwealth, and repeated have been the failures to establish a republic in France, simply because this one essential requisite to a popular form of government was wanting.

Now, virtue or morality is quite as necessary to the healthy operation of a free-labour market as it is to a free form of government. We have in England the most unrestricted competition of workmen, and we have, too, the greatest amount of social distress in the civilized world; and arguing from effect to the cause, we detect the absence of that great popular regulator to which allusion has been made. Beholding this state of things, and predicting rottenness to the nation therefrom, we draw attention to certain modifications of this entire liberty, and several plans for producing an improved relationship between employer and employed.

The trade corporations in the momentary system have, in many respects, an affinity with the system of feudal

patronage, especially where the workshops are directed by water-power, and scattered over the country. Numerous privileges of the former system then accrue to the workman, such as house and garden, forest rights, wood-cutting common pasture, and shooting, &c.; but the supervision of the trade, the establishment of rules to banish unhealthy competition, and to insure the labourer a fair measure of employment, the organization of mutual insurance funds to guarantee the old and infirm uniform support—these, instead of depending on the wisdom of large capitalists, are determined by a committee of the leading workmen themselves. Such societies formerly existed in this country under the name of *guilds*. The term is one of very early date amongst the Saxons as applied to a sort of vicarial fraternity; but it seems to have been at the close of the eleventh century that “merchant-guilds,” &c., came into use in England, and the idea was probably imported from the free cities of Italy. They were not confined to trades, but embraced many branches of manufacture. They exist to a large extent still in the south of Germany, and are now companies or associations having laws or orders made by themselves, in virtue of authority from the prince to that effect. They produce like results to what they produced here. By limiting the number of apprentices under each master they provide against undue competition. By preventing any journeyman from exercising the functions of master or from working on his own account without having given proof of his efficiency by taking out his diploma, they save the public and themselves from quackery, &c. By habituating the journeymen or companions to travel through the towns of the empire they increase their intelligence and efficiency, and lead them, unfettered by local prejudices, to view that place as their home where their services are likely to be most in request.

In these class corporations there is a perfect spirit of equality combined with a due gradation of rank: each member regards his fellow as a brother, and feels that he is a subject to no laws but what have been framed for the interest of the society, and which he may be called on one day to supervise and administer. These are so many self-constituted republics, where the popular element is combined in a certain degree with the aristocratical, and where the safety of each individual is insured by the joint co-ordination and mutual assistance of all. But when the workmen seek the monopoly of the public-market on their own terms, individual liberty is interfered with, and the public is not perhaps so well served as they are by unrestricted compe-

tion; but society is relieved from the support of pauperized labourers, the public streets from some of the worst forms of mendicity, and the workman himself is taught to regard his trade as his inheritance, which he can leave as a secure source of income to his posterity.

These facts are full of valuable instruction of a kind much needed in our day. We wish the redeeming features of the system that was the necessity of serfdom might come to be the choice of those nations, like England and France in a swift state of progress. In the excess of freedom they have cast away at once supports that galled, and supports that did good service. The retention of some of these last might have contributed to the vigour and maturity of the young giant, Free Labour.

These ancient corporations exist nowhere now but in Germany. And even in Germany the recent improvement in machines, and revelations in chemistry, and appliances of steam power and hydraulic pressure, are daily contracting their circle, and promise to explode them altogether. In England the Cutlers' Society alone remains. Cheap labour and colossal establishments have been used to undersell them, and of course they will undersell them when people are always ready to sacrifice quality to appearance, and care no more for men and women than for spinning-jinnies: the old bonds of fraternity are broken, our labourers are antagonistic, they strive fiercely one against the other, and those that lag behind are snatched up by the furies of hunger and crime that follow upon the trail of its onward movement.

The substitution of steam and coal for water and wood, has broken up most of those rural manufactures where the workman was protected by many of its old rights and immunities, and grouped our populations, destitute of all resources beyond their ephemeral salary, round the coal mines which supply the new manufactures with their motive power. Thus Manchester and Liverpool have grown up around the mines of Lancashire, Birmingham on those of Staffordshire, Leeds and Sheffield on those of Yorkshire, Glasgow on those of lower Scotland. The old towns have emptied half their inhabitants into these localities; the peasant, also, allured by the high precarious remuneration which they offer, has left his low-paid but certain employment in the country; and when over-speculation or a glut in the market necessitates a contraction of supply, a crush ensues, and the multitude, deprived of their ancient resources, are brought to the verge of pauperism.

The Enclosure Bill, by breaking up common pasture right, has, while doing much good, done much mischief. Hence, as in the manufacturing districts, a chasm between master and workmen has been made, and of which come misunderstanding, hatred, hearburnings, and combinations.

While looking at these old guilds and brotherhoods, and admiring the good that is in them, we do not advocate a return to them, but we do advocate a return to that great and saving principle of goodwill and fraternity on which they were founded. Acting on this, we shall find ourselves nearer to them even in form than we now think it possible to be, for such things have almost assumed the guise of old wives' fables to the dashing speculators and fast men of our age.

Now to supply a practical application to this letter, let us ask how many of those who read it have reduced wages during the past season, not because men could do with less money, but because men were more numerous—because, in fact, it was “a slack time,” and they could command labour at their own terms? We, of course, cannot reply to this question; but we can form some notion of the bulk the volume should have, which contained the names of those who answered the question in the affirmative, so deeply rooted is this pernicious practice.

Well, here is the very case in point: an instance of that want of principle which makes the momentary system so ruinous to the poor, and so dangerous to the community.

In following out our remarks, we submit that, under an unrestricted system of labour, men should be able to turn their hands to many sorts of employment, particularly in the great manufacturing centres, where multitudes are often suddenly deprived of their means. But this versatility is less characteristic of the urban than of the rural population. We hear those who care for nothing but to work up the raw material cheaply and quickly, praising the *division of labour*. They see no further than the extra finish attained. And we can find no words of our own to express our feelings on this subject, equal to those of Mr. Ruskin. In the sixth chapter of the second volume of “The Stones of Venice,” in speaking of Gothic architecture, he says:

“We have much studied and much perfected, of late, the great civilized invention of the division of labour; only we give it a false name. It is not, truly speaking, the labour that is divided, but the men; divided into mere segments of men—broken into small fragments and crumbs of life; so that all the little piece of intelligence that is left in a man is not enough to make a pin or a nail, but exhausts itself into making the point of a pin, or the head of a nail. Now it is a good and desirable thing, truly, to make many pins in a day; but if we could only see with what crystal sand their points were polished—and of human soul, much that to be magnified before it can be discerned for what it is—we should think there might be some loss in it also. And the great cry that arises from all our manufacturing cities, louder than their furnace-blast, is all, in very deed, for this—that we manufacture everything there except men. We blanch cotton, and strengthen steel, and refine sugar, and shape pottery; but to brighten, to strengthen, to refine, or to form a single living spirit, never enters into our estimate of advantages. And all the evil to which that cry is urging our myriads can be only met in one way: not by teaching nor preaching; for to teach them is but to show them their misery; and to preach to them, if we do nothing more than preach, is to mock at it. It can be met only by a right understanding, on the part of all classes, of what kinds of labour are good for men, raising them and making them happy; by a determined sacrifice of such convenience, or beauty, or cheapness as is to be got only by the degradation of the workman; and by equally determined demand for the products and results of healthy and ennobling labour.”

And this advice is as available for the farmer as the manufacturer, since the one is not more prone than the other to consider the moral influence of work, or the *responsibility of capitalists*. Mr. Ruskin has looked deeply and tearfully into this matter. Like ourselves, he has seen that myriads, trained only to the solitary pursuit by which they earn their bread, have, when that resource fails, no choice left between famine and the workhouse. In proportion as science has multiplied the means of reproduction, the division of labour has developed itself; and in proportion as this has taken place, the number of able-bodied paupers has increased. In sacrificing everything to the exercise of unbridled liberty, and allowing the old social forms to be rudely displaced by any innovations, and to place mankind in new positions, unfettered by laws designed to ensure their social stability, we sought to effect a reform, but have improvised a revolution.

And society is left to blunder through this cycle of changes. Even the increase of pauperism, which is the crying abuse of the day, is met on the same principle as

in Henry VIII.'s time. The unfortunate victim of general enlightenment and unrestricted freedom is, as soon as he presents himself, sent back to his parish, to be stowed away; and his fellow-parishioners are taxed for his support, at a rate which generally amounts to more than double the sum required for his subsistence. Instead of getting rid of the anomaly, we have sought to domesticate it amongst us. So much are we enamoured of its results, as to force it upon our outlying dependencies. But this invention meets not the requirements of the case. The more sensitive and dignified poor, sooner than have recourse to its provisions, undergo the greatest hardships; and, in spite of enormous assessments, misery is before us everywhere.

We cannot, under these circumstances, speak words of peace nor of gratulation. We may allow that our imports and exports show a state of progress unparalleled in the history of nations; but the seeds of decay are scattered abroad, and the same causes which operated to hasten and complete the fall of the Roman empire, are at work amongst us, and threaten our stability. As those who desire that our country may continue to be the great sun of the civilized system, we must hasten to avert the darkening shades of this social corruption. One way, as masters in which we may succeed to this end, is in systematically cherishing a practical sympathy towards our work-people. The rich sever themselves too far from the poor; and a spirit of distrust grows up between. The rich distrust the poor: the poor distrust and hate the rich. M. de Tocqueville, writing of the causes of the French Revolution of 1789, says that the separation of classes was one of the most potent causes of almost all the disorders which led to the dissolution of the old society of France. Inseparable barriers were placed between the nobles, the bourgeoisie, and the tiers d'état. This spirit of disaffection was rather nurtured by the denaturalizing spirit of centralization which was inspired into the Government of Louis XI., in 1692, for the purpose of curtailing the liberties of the towns, which were deemed very alarming. This spirit, insidiously working, produced a uniformity of society, but destroyed the power of unity. French society presented the paradox of a collective individuality. While, however, we would not do away with a due gradation of rank, we think that it would be well to bridge over those fearful gays that do exist between the classes of our land, by a present sympathy. The distrust arises out of ignorance. Did the rich know more of the virtues of the poor, they would esteem them better: did the poor know better the noble qualities of the rich, they would learn more to appreciate and less to distrust them. So long as this spirit of disaffection continues, it must increase—it is a feeling that admits of no stagnation; and some future political economist, writing at Sydney, may say: "Surely the wreck of three empires on the same rock—Rome, France, Great Britain—should induce us to amend our chart, and seek a safer course." To avert such a disaster, we can only, of course, work individually, and use our influence in a right direction. Does it not seem as if, to

this end, we may learn sometimes even from feudalism? There was a glorious spirit that now-and-then broke forth in those dark times—a spirit that told of a tender, affectionate regard downwards, and a deep-rooted attachment upwards. It is something of this spirit of fraternity that we must endeavour to conserve amongst us—the identical spirit that animated that old mountain-servant who, two hundred years ago, at Inverskeithing, gave up his own life and the lives of his seven sons for his chief; as each fell, calling forth another to the death—"Another for Hector!" But had Hector been a rigid disciple of our present school of Political Economy, think you that he would have had a faithful servant to cry "Another for Hector?"

Farmer Spudweed wouldn't find that Smith worked with less energy, because, when his wife died, he inquired kindly about the children, and helped Smith with a little advice as to the best means of putting some of the elder ones "in a way." If the farmer value the "God bless you!" of the poor, he would be more likely to get it by interesting himself in the family affairs of the poor around him, than in preserving an indifferent or haughty bearing, which he may think more conducive to his dignity.

Another way, as we have before stated, of improving the good feeling between masters and workmen, is by practically recognising our responsibility—a responsibility that never terminates—a responsibility that does not display itself in spasmodic efforts, but which is systematic in its beneficial action. We are no advocates of a maudlin, sentimental liberality, that hires vagrants and spawns slaves. That system of soup-tickets, blanket-societies, and doles, does but degrade our poor. It originates in kind feelings, but feelings based on false thinking.

The best species of philanthropy, just now, is to prove to the poor that there pass into their hands the complete materials for subsistence and comfort. Where the masters are not conscientious, of course this cannot be done; but where wages are fair, they are capable of being proved, by the exercise of providence and economy, sufficient for the reasonable wants of people in such a station.

Some time ago, a gentleman, knowing the improvident habits of the poor, offered, in a season of unusual distress, to share a cottage with a man, his wife, and their six children. He stipulated that the commissariat department should be entrusted to him. He lived with the cottagers for six weeks, and introduced them to a degree of comfort they had never before known, through a judicious expenditure only of their scanty wages. It is hardly to be expected that every benevolent gentleman should be prepared to make this sacrifice; but we see from the example how desirable it is that the poor should be taught, by some means or other, to husband their resources with far more judgment than they do.

The experimentalist just mentioned says nothing about finding any surplus, after supplying bodily wants, to alight the minds of the children; and, where the experiment was made, we do not suppose such means are supplied by the farmer. When this is the case, we,

as masters, should see that the right we deny them in one way, should be rendered in another.

The mining proprietors of Sweden and Norway and Germany hold themselves responsible for the social comfort of their work-people during stagnation of trade. It would be well if we, instead of doing this, could teach ours to be so provident of their resources as to make this provision for themselves. But it is absurd to expect to achieve this triumph, while we continue to hold up the temptation of a *Perennial Fund*, to the ruin of those whose principle is not strong enough to make them self-reliant. It is vain to preach providence, while we hold forth such a license to improvidence.

Oh, are there not some wonderful anomalies in our England? The pauper, who sinks willingly upon his dirty feather-bed, we feed and foster; the criminal whose fall is consummated, we pet and comfort; the frugal, toiling labourer, who is struggling, with all his earnest soul, to keep himself from the gulf of eleemosynary degradation, we load with fresh burdens, and mulct and neglect, for the benefit of the complacent recipient of charitable doles; the honest man, just stumbling on the verge of guilt, and striving to avoid it—like many an agricultural labourer this winter—we proffer no aid to, but surround with fresh temptations.

F. R. S.

EMIGRATION AND EMPLOYMENT BY ASSOCIATION.

The old site of Smithfield Market is now turned to a new purpose. It has become the scene of meetings of the unemployed artificers of the metropolis, who have been thrown out of work by the slackness in house building, which in every business follows periods of paroxysmal activity. The unemployed artificers are urged by some of the orators who address them on these occasions, to demand a division among them of our unenclosed waste lands as a remedy for their distress, in the hopes of restoring those good old times, which never existed except in the imagination of the poet, when every rood of ground maintained its man. It might have been supposed that the failure of so many freehold land societies, established a few years back, would have effected a cure for this species of delusion. Perhaps, however, the majority of those who attended these meetings, either as speakers or listeners, were not aware of the fact.

The parties, moreover, who assembled on this occasion, appear not to have been aware of another fact, that while the land remaining to be enclosed in this country is chiefly of the poorest description, which can only be made productive by the expenditure of a large amount of capital, there is in our colonies not only a great demand, at high wages, for the description of workmen who are unemployed here, together with cheap food, but also a vast area of the finest land, in which they may invest their savings to good account, and thus make a provision for their old age and for their children, as the owners and cultivators of their 200 or 300 acres, to be worked partly with their own and partly with the assistance of hired labour.

In the Melbourne papers we read, a few weeks back, the following as the scale of remuneration, with rations, for agricultural labourers, as well as for mechanics. Rough workmen of all kinds meet with ready employment, at the following rates:—

	Per annum.
Married couples, without families..	£75 to £80
Do., with families .....	£55 to £65
Gardeners .....	50
Grooms .....	40
Shepherds .....	35
Hut keepers .....	25
General servants.....	20

These wages, it should be remembered, are in addition to rations.

Now, a mechanic who can get out to Australia, either from his own resources or through the Emigration Commissioners, and wishes to exchange the employment to which he has been accustomed for the occupations of rural life, is always eligible as an Australian shepherd; for employment of that kind is different from that of a shepherd in this country. It is not necessary that he should even have seen a sheep before his arrival there; perhaps, on the contrary, it is better that he should not. The duties of an Australian shepherd are so different from those of the same calling in this country, that the veriest Londoner can soon learn them, and perform them better than one who has old habits to unlearn. Then, again, as regards rations, which are given in addition to the above wages—the standard weekly rations—are the following: 10lbs. of flour, 12lbs. of beef or mutton, 2lbs. of sugar, and half-a-pound of tea. As regards household servants, men-cooks receive from £70 to £80 a year. These are not men-cooks of the London stamp, but cooks like those on board ship. Female cooks are in less request, receiving from £30 to £35 per annum. Nursemaids, £20 to £25; and besides these wages, much better matrimonial prospects than await them here.

It was added that there was a good demand for all kinds of skilled labourers, especially among the building trades. These are the very class of unemployed workmen who are meeting in Smithfield, and who are promised as a remedy for their distress a few acres of poor land, which, so far from operating as a relief, would only aggravate it.

The wages of mechanics *without* rations were stated as follows:—Carpenters, 14s. to 15s. a day; masons, 15s.; plasterers, 14s. to 15s.; quarrymen, 10s.; labourers on the road, 9s. to 10s. per day, with water and tents provided.

We give these particulars as they appear in the Melbourne papers; of course, however, intending emigrants will do well not to trust entirely to these statements, but to obtain official information as to the state of the labour market, through the Emigration

Commissioners or their agents. In these inquiries they will always find some person to assist them: among the best to be consulted are those by whom they have been employed, or the parish clergymen. The voyage to Australia, however, is a long and expensive one, beyond the resources of most of those to whom emigration is recommended as a remedy for the distress arising from an excess of workmen of a particular calling, compared with the existing demand. There are free passages granted, it is true, by the local government, from the proceeds of the land sales. The conditions on which they are granted have undergone some modifications of late, and we are not at present informed of their precise nature. This, however, may be easily learned on application to the Emigration Commissioners, at the same time that inquiries are made respecting the demand for particular kinds of labour. We know, however, on the best authority, that a man who goes out to the colonies at his own expense, holds a more independent position than he who emigrates at the public expense. The peasantry of Ireland, during the distress arising out of the potato failure, solved the problem of a self-supporting system of emigration, in which millions of money have been expended, and millions of persons removed from a state of want to that of independence. The Irish emigration has been chiefly to the United States. There, however, it has been overdone; and there are not a few instances of their having returned, partly from this cause, and partly from the "Know-nothing" opposition to them, in consequence of their numbers having reduced the rate of wages to the native workmen.

And how was the Irish emigration conducted? A contribution was raised among their family and friends, sufficient to send out one member of a family, with the understanding that as soon as he was able, from the receipt of the good wages and low-priced food to be obtained in all newly-settled countries, he was to return the loan, to be re-lent to another desirous of emigrating. Instances of the pledge of re-payment being broken were extremely rare. Now, what the poor Irish can do, cannot the more highly-paid Anglo-Saxon artificers of this country do? Among the agricultural labourers of England juster notions prevail on the subject of machinery than were current thirty years back. The introduction of machinery into agricultural operations is no longer regarded by them as an invention for the "murder of mankind," as it was often called then, but as a means of abridging the toil of the workmen, and of the employment of additional labour on one operation, by the means of the money saved by machinery on another. They see, too, that on those farms where there is the most machinery employed, there the most money is expended on human labour. It will not be long before juster notions will prevail among the working classes on the subject of emigration, and the means which our colonies afford to them of raising themselves in the social scale. What we would urge, then, on all those trades in which there is a periodical fluctuation in the demand for their services, is to institute emigration societies, for the pur-

pose of enabling those who are out of employment to transfer themselves to those colonies where they are in request; whether they give the preference to Australia, New Zealand, or Canada. Canada holds out many inducements to the emigrant; among others, its comparatively short distance, and the small expense at which it may be reached. The advantages, however, which Canada offers to intending emigrants, agricultural and non-agricultural, must be reserved for future discussion.

Since the above was in type a meeting of the British Workman's Association has taken place, in which the true remedy for the present distress was fully recognised. A call has been made on the Government to assist the unemployed to emigrate to the British colonies; and the principle has been very properly recognised, that the assistance shall only be by way of loan, and considering the present urgency of the case we think the Government fairly called upon. Various statements have also been made to the effect that red tapism, at the office of the Emigration Commissioners, throws impediments in the way of the emigration of the very description of persons who are most eligible, and for whom at the present time emigration is most required. We would, therefore, suggest to the working classes the formation of an Emigration Association, the object of which shall be to assist those disposed to emigrate to the British colonies to do so, and to assist them by way of loan. Another object of the Association should be to collect reliable information as to the demand for particular kinds of labour in the different colonies. The sums which have been wasted on unsuccessful strikes, if applied to promoting emigration by way of loan, would have a far more beneficial effect on wages, and on the position of the labouring classes than was ever yet obtained by the most successful strike.

#### EMIGRATION TO CANADA.

A correspondent from the country has written to us for information respecting the best mode of proceeding, in emigrating to Canada, with regard to the purchase of land, and the most eligible part in which to settle, the system of agriculture, &c., practised there, &c., &c. In reply, we advise him by no means to settle in the lower province, but to go at once to Upper Canada. In the former, he will have to encounter the prejudices and the non-progressive disposition of the French Canadians, whilst in the latter he will find a true English population prosperous and spirited. The London district is essentially English, a great number of the settlers being Norfolk and Suffolk men, who have carried thither their industrious and active habits, and their intelligence and experience in husbandry. These he will find useful neighbours and friends; for a similarity of wants renders all persons friendly in a new country.

We would also strongly recommend him by no means to trouble himself with any inquiry about land until he arrives out, and then to take his time and look round

him before he makes his selection. There are plenty of agents here who would help him into difficulties with great pleasure and alacrity; and hosts of them in Canada, all of whom have the very best tracts of land to dispose of. His best plan will be to consult some old and respectable settler, who will be more likely to give him impartial and valuable advice than a land-agent either out there or in this country.

With respect to works treating on Canadian affairs, we know of no one better or more complete than Montgomery Martin's History of the British Colonies, which has come out in numbers. We believe the numbers referring to Canada may be had at the publisher's separately, and he will find it contains a vast fund of general information respecting that colony, that will be of great service to him.

With regard to tools and implements of husbandry, it will not be any advantage taking either them or furniture with him. He will find that he can furnish himself with both at as cheap a rate as he can purchase them here. Even if he has them by him already, I much question whether it would not be advisable to sell them off, and so convert everything into money, and save himself the trouble and annoyance of taking them hundreds of miles up the country at a great expense. We have known many emigrants regret having taken things out with them, having found the trouble and expense very great, and discovered, on arrival, that they could have purchased them on the spot at nearly English prices. No furniture will pay, for taking over, except beds, which, as he will want them on the passage, it will be as well for him to provide himself with.

### THE RECLAMATION OF WASTE LANDS—WHERE HITHERTO ACCOMPLISHED.

The Central Farmers' Club has been more than usually happy, of late, in timing its subjects to appropriate periods, as well as in selecting the best men to deal with these. Nothing, for instance, could be more welcome than Mr. Baker's paper on Manures, when we were just at the very height of our difficulty as to what manures we could resort to. It was no slight service to have a practical farmer demonstrate to his brethren that they had more material about them than they appeared to be aware of. The March discussion, again, was introduced under equally favourable auspices. The mob orators of Smithfield were declaiming against the waste of land in this country, and *The Times* newspaper was answering them, precisely at the time when the members of the Club met to consider "the best means of improving the cultivation of poor and hilly lands."

This selection was in every way judicious—not only in the thesis itself, but especially so in the gentleman to whom its treatment was entrusted. We say advisedly there is no man in England who should be heard with more attention on the improvement of poor lands as Mr. Robert Smith, now of Exmoor, and late of Rutland. Seldom has the previous career of any one so thoroughly prepared him for the duty he undertakes as had been the case with Mr. Smith, in relation to the subject he was here called upon to handle. Brought up and living for many years in an adjoining county, he had become, of course, thoroughly acquainted with the means by which so far our great triumph in the reclamation of land had been achieved. Almost himself a Lincolnshire man, he had closely studied every cause and effect in the extraordinary alteration of the fen country. His more recent experience speaks yet more directly to his energy and capabilities. What Robert Smith has accomplished on Exmoor is by this nearly as well known as what the Yarboroughs and the Chaplins have done for Lincoln.

It is significant, and well worthy of notice, to see how in either district we arrive at our object by the

same road. Mr. Smith may transport himself bodily from Lincoln to Devon, but he has all his early lessons and precepts strong upon him still. The great secret, the key-stone in the foundation of the improvement of either Lincolnshire or Devonshire is the same. Properly it should be a joint concern: The landlord should take his due share in the good work; but, above all, the tenant should have the effect of his labour indisputably secured to him. Mr. Smith's paper has continual reference to this principle. "Those who long preceded us," he says, "had English zeal at their hearts, and practice at their fingers' ends. But they had more: they had, even in those days, the forethought of establishing an equitable custom for the security of their capital." What, again, he asks, "are the inducements we should offer farmers to face the poor lands yet untouched? What can the landlord give? Low rents, long leases, permanent improvements, and liberal security for unexhausted investments." It is hardly necessary to add that he practises all he preaches, and that on the Knight property on Exmoor tenant-right agreements have been one of the chief means used in developing the energies of the tenant and the resources of the soil.

The address delivered last week to an audience mainly composed of practical men had the one essential advantage of being a detail of the speaker's own practice and experience. Of the success of this there is now no question. The only solid objection would seem to be in that offered by Mr. Scott, that the return is placed a little too far on. The plan, however, advocated is clearly grounded on the supposition that the landlord will do his part, by draining, and establishing other permanent improvements, which, as Mr. Scott himself well observed, should be put down to the cost of the capital account—the buying, as it were, the fee-simple of the land over again. We confess that our own opinions lean almost entirely with those of Mr. Smith. It is no mere spurt, or "small profits and quick returns," that will materially improve poor cultivation.



If there be any soils still worth working on, and whose increase may vie with the examples we have in Lincoln and Devon, we may be assured their established advancement must be a work of time. Nothing goes back so surely or so quickly as an ungrateful soil only half dealt with.

As many of our readers may have remarked from the report we have already given, the discussion which ensued was by no means up to the mark of the opening paper. This, perhaps, under the best of circumstances, could hardly have been expected. With the exception, however, of Mr. Scott and the chairman, hardly one of the other speakers touched materially on Mr. Smith's remarks, or indeed on the subject at all, as it stood on the card. To Mr. Scott we have already referred, while Mr. Wallis dwelt on a strong point altogether unnoticed—the policy of using hilly lands, unfitted for the growth of corn, as stock farms only. Although not mentioned at the meeting, this too, we believe, is part of Mr. Smith's practice. Many of the tenants on Exmoor are Lincolnshire men, who once or twice a year move and remove their sheep and cattle from the lowlands of the one county to the wilds of the new settlement.

If not precisely to the point with us all here at home, the occasion offered a very becoming opportunity for the official announcement of a scheme that has now for some little time been talked over in agricultural circles. Whatever more we may do, or may not do in England, a strong effort is about being made to advance the cultivation of France. Monsieur Trehonnais declared he was now "engaged in forming, with the approbation of the French Government, a Land-improvement Society;" and it is only justice to say that such a project could not have been in better hands. Monsieur Trehonnais is already well known to our most eminent agriculturists; and as his energy is only equalled by his eloquence, our neighbours may feel every confidence that he will do his best with the venture he has embarked on.

The chief impediment to improved cultivation in France is one that we are not very likely to fall into here. It may be all very well for Brown, Jones, and Robinson, in Smithfield, to *talk* of giving every man his twenty acres of land, and setting up Snob the shoemaker, and Trimmings the tailor, to grow turnips and feed sheep; but it could hardly be worth the time of the Farmers' Club to answer such nonsense. "How to improve the poor lands of England?" Answer—"Not by adopting the plans of Mr. Ernest Jones," sounds something like a self-evident proposition.

The general tone of the debate appeared to infer that in reality there was not so much poor and hilly land to improve as was commonly supposed. Such an impression must be received with caution. But a few years since, and Exmoor, no doubt, would have been pronounced not worth the trouble; a few years yet further back, and Lincolnshire would have been as certainly condemned. Of course people must take some care in what they deal with, although in these days, with geology and other sciences brought

more and more within the range of the agriculturist, we start with advantages our fathers never possessed. "All lands," writes Mr. Smith, in a prize essay for the Royal Agricultural Society, and which appeared almost simultaneously with his address at the Farmers' Club"—all lands as yet uncultivated or unreclaimed are properly termed the waste-lands of England. They include several varieties of soil, and are placed at various elevations. They have each in their way some local and peculiar influences bearing upon their power of affording a due return for any spirited outlay advanced for their improvement. It admits of a question whether the modern improvements in practice or in science have progressed to such a degree as to give us any new advantages in grappling with those ancient difficulties which have caused certain moorlands to be hitherto neglected?"

The answer to this question we take to be an affirmative and encouraging one. We gather it, indeed, from Mr. Smith's own career; and while we may congratulate him on his success, we may thank him for his example.

#### WHAT THE HEREFORD OXEN WERE NEARLY HALF-A-CENTURY BACK.

SIR,—Perhaps the following lines may be amusing to the rising generation of farmers. The transcendent prices which the fat Hereford oxen made in Smithfield about fifty years back struck vast quantities of spectators with admiration and astonishment. If memory serves me right, in the year 1812 or 1813 I saw sold in Smithfield Christmas market fifty Hereford oxen, belonging to the high-famed Mr. Westcar, living in the Vale of Aylesbury, that averaged 50 guineas each, making 2,500 guineas. At the same time, in Smithfield Mr. Richard Kightley, of Castlethorpe, Bucks, sold thirty Hereford oxen that averaged £57 each, making £1,710. Mr. Kightley's oxen were sold by himself, and Mr. Westcar's fifty oxen were sold by Mr. Thomas Potter. Mr. Westcar was heard to say in Smithfield, that of the heaviest Hereford ox he ever fed, the carcass when dead weighed 157 stones 2lbs. of 14 lbs. to the stone. We have no Hereford kept to any age that would weigh that now.

The old and famous breed of Herefords are not so large in frame as they were fifty years back; but are more complete, and feed at an earlier age. Nearly all the above-named high-priced gigantic oxen had been worked, and had earned some money at the plough and other labour, before they were fed. At that time it was well known that Mr. Westcar had a large close, that kept the whole of the summer 200 large oxen, and with the 200 oxen fed 300 ewes and their lambs: all went to market the same year. Buckinghamshire has for many years been famous for grazing first-rate Hereford cattle; and Sir Charles Knightley has some tenants in Northamptonshire who are famous for grazing Hereford steers of the best quality. The far-famed Mr. Richard Hewitt, of Dodford, for instance, is said to be second to no man in the judgment of first-rate quality and symmetry of sheep and oxen.

King-street,  
Smithfield, Feb. 3.

Yours truly,  
SAMUEL ARNSBY.

## IRRIGATION IN ITALY.

## No. III.—PRACTICAL.

In the preparation of the land for the "marcite" system, it is usual to crop in the first instance with Indian corn: this requiring constant weeding and cleaning, brings the soil into good condition. In October the crop is cut, and the roots carefully removed; and the land ploughed and harrowed, and brought to as smooth a surface as possible. In this condition it remains till January, when the irrigatory works are commenced. The first duty of the *comparo*, or the party who superintends the distribution of the water, is to lay and well prepare the main channel, which is situated on the highest part of the field. The field is next divided into a series of rectangular compartments, between which minor irrigatory channels, at right angles to the main channel, are made. The width never exceeds 25 or 30 feet, the length being usually eight or ten times this extent. All the compartments are made to slope on each side of the main channel, in the ratio of 0.3 in 1. The water passing from the main enters the minor channel on the top of each compartment or ridge, and is shed over each side in a thin stream, yielding constant stimulus to the grass. Still smaller channels are made in the space between the minor channels, which receive the water from the side slopes of two contiguous minor channels. The whole of these channels discharge into a main drainage channel, which is made parallel to the main irrigatory one.

When all the channels have been constructed, a second ploughing and harrowing is given to the land, which is then left to the end of February or beginning of March, when it is again ploughed and harrowed and thoroughly cleaned from all weeds. Oats, about  $4\frac{1}{2}$  bushels to the acre, are then sown in April. After harrowing, clover and Italian ryegrass are sown in the proportion of a bushel per acre of the latter, and a fourth of a bushel of the former. It is at this stage that the small channels in the "furrows" are made. Spaces are usually left at both ends of the meadow of sufficient breadth to allow carts to pass, the channels being carried across these by wooden pipes. Captain Smith estimates the expense of forming a water-meadow at an average of £6 per acre. The water required for marcite cultivation is described as enormous. According to a good authority, "the total quantity of 6 cubic feet, if thoroughly economized, would be sufficient in actual practice for the irrigation of from 15 to 18 acres, being from  $2\frac{1}{2}$  to 3 acres per cubic foot." Where the surplus waters of irrigation are lost, it appears that the continued discharge of one cubic foot over an acre of marcite is equal to the passing over of its surface, in every twenty-four hours, of the enormous quantity of 86,400 cubic feet, or nearly 390 tons, or 14,400 gallons of water. For this amount of discharge, as above noted, that is one cubic foot per three acres, £3 is charged for the winter months; thus making the cost of water supply equal to about 20s. per acre.

As to the produce of marcite meadows, our author gives what he esteems a fair average statement, under circumstances possessing "no special advantages, such as vicinity to large towns, or command of sewerage waters." The yield per acre is given as follows:—

1st cutting in February .....	cwt.	84.00
2nd ,, from March to April .....		126.00
3rd ,, from April to May .....		131.25
4th ,, from May to beginning of July.		73.50
5th ,, from July to middle of Sept ..		63.00

477.75

Or nearly 24 tons of grass. The *marcite* meadows in the vicinity of Milan, however, give fully twice this quantity; being cut in November, January, March, and April, for stable-feedings, and in June, July, and August they furnish three crops of hay; while in September they afford an abundant pasturage to the cattle. They thus give seven crops during the year, and the ordinary yield per acre is estimated at from 45 to 50 tons, with half as much more in remarkable instances.

Under ordinary circumstances 35 acres are considered sufficient to supply grass and hay to keep 50 cattle stall-fed; these being turned out to pasture in September and October. Of this amount of acreage, 20 acres are required to furnish supplies of grass for seven months, with 15 acres for the hay for three winter months. The author gives a table of "expenses" and "returns" of a farm keeping 50 cows, having 20 acres *marcite*, from which it appears that the "returns" are equal to about £11 2s. 6d. per acre; to which is to be added the value of the plantations invariably surrounding irrigated lands, which is taken at £1 6s. per acre annually. This gives, where the water belongs to the proprietor of the land, a return of £12 8s. 6d. per acre; reduced by 20s. where the water has to be paid for. As the net returns are usually divided between the landlord and the tenant, the rent may be taken as at from £5 to £6 per acre. Where the produce is sold off the farm, the rent ranges from £7 to £8 10s. In the neighbourhood of Milan the returns are very much higher—from £10 to £12, and occasionally to £21 per acre.

The production of the *marcite* meadows being continuous, manure is used to a great extent. The clearings of the channels, with the fresh earth from the surface of the land, together with the manure from the stable and cow-houses, are made into a "compost," which is applied at the rate of 250 cwt. per acre during the year. Linseed oil-cake and lime powder, in the proportion of seven of the former to one of the latter, is often used as a manure, at the rate of about 15 cwt. to the acre.

But the most highly-prized of the manures for the *marcite* meadows is the "refuse of the pigsties which are attached to every farm, and in which the otherwise-useless products of the dairy are consumed. So im-

portant is this manure considered, that persons who do not themselves manufacture cheese or butter always make it a condition with the parties to whom they dispose of the produce of their cows that a certain number of pigs shall be maintained on the farm. It is usually calculated that three pigs supply, in the course of the year, manure sufficient for one acre of *marcile*." It is applied in the liquid form, at any season of the year, care being taken to apply it after the cutting, as it is found to injure the growing crop.

A notable feature of the agriculture of Northern Italy is the rice cultivation. This is divided into two classes, permanent and temporary. The former is carried out only in low, marshy localities; these abounding principally in the districts of Mantua and Verona. As this crop is the only one which these lands are capable of producing, it naturally assumes an important commercial aspect. Where rice is cultivated under the other class, it takes part of the rotation, which, extending over nine years, is divided as follows:—"1st year, wheat with grass seeds; 2nd, 3rd, and 4th, meadows; 5th, 6th, and 7th, rice; 8th and 9th, Indian corn or other crops, varying from year to year." In the swampy districts already alluded to, the produce per acre is taken at 30 to 35 bushels of uncleaned grain; while the "temporary" lands in their vicinity yield 40, and sometimes as high as 60 or 70 bushels. The process of cleaning reduces its bulk to about one-third; this must, therefore, be taken into account in the calculation. Where the crop enters into rotation, the mean produce of four years is given, by Captain Smith, at 51 to 55 bushels of uncleaned, and 17 to 18 bushels of cleaned. Taking 6s. as the return per bushel of the cleaned rice, the gross average return is £5 6s. 9d. per acre. The expenses of cultivation, of the case cited, were as low as 15s. per acre; "and supposing the expense of water to double this amount, we have a net return of £4 11s. 9d. per acre." In some years this return has been as much as £7 5s. Notwithstanding its admitted unhealthiness, the cultivation of the rice crop is becoming extended, the profits being so considerable. For a notice of what has been done to "reconcile sanitary and pecuniary interests," we refer the reader to the work now under review.

An important feature in connection with the system of irrigation in Northern Italy which we have now described is, that it demands, as essential to its existence, the possession of large capital, and the concentration of property in the hands of wealthy proprietors. To this combination its actual development is due; "and however well the system of small farms may act in Upper Lombardy, I believe it would be the entire ruin of those provinces where fertility has been produced entirely by these canals of irrigation, constructed at vast original outlay, and maintained at present by heavy and annually increasing expenses beyond the means of small proprietors to defray."

The relation subsisting between these large proprietors seems to be of a very satisfactory character. In letting their farms three systems are adopted: first, the *affitto in denaro*, or payment in coin. This is almost exclu-

sively confined to "those great irrigated farms which require the constant superintendence of highly-qualified men possessed of considerable capital." The arrangements adopted to carry out this system are very complete, and afford universal satisfaction. Prior to the entrance of the tenant the proprietor engages an engineer to make a survey of the whole farm, this being so complete in every department that the plantations are numbered tree by tree—everything is carefully set down. On the expiry of the lease a second survey is gone through, and a balance-sheet (*bilancio*) is prepared from the comparison of the two.

The second system of "letting" is termed the *affitto a mezzadria*, literally meaning equal division of the products between the proprietor and tenant, but in practice referring to the system where the produce is divided no matter in what proportion. For description of this method we refer to the writer. It is not, however, found to work so well, which has given rise to a third system, termed *affitto a grano*, by which the tenant is bound to pay to the proprietor a certain quantity of wheat, ranging from 14 to 20 bushels for each acre under cultivation.

In Lombardy "it has been almost the invariable practice of the government to sell the water in absolute property to the possessors of the soil." This system is found to operate very beneficially; and from the facility which it affords to the proprietor to lay out his capital in the formation of the minor canals necessary for irrigating purposes, these have been constructed to such an extent "that the whole surface of the country is covered by them as by a dense net-work." To the casual observer this system of ramification would seem to give rise to endless disputes, from the apparent invasion of private rights; but a complete system of legislation has been instituted to define the various points which would probably give rise to disputes.

To carry out the various adjustments of this legislation the services of a body of highly-educated engineers are required. "Not only do they design and superintend the construction of the various kinds of works, whether ordinary or hydraulic, which are required, but the whole of the details of leases, the preparation of the various documents required on the part of the landlord and tenant, and advice as to the different improvements of which the land may be susceptible, are committed to or required from them." From this will be seen "how important a part the engineers of Lombardy are required to take in the whole agricultural system."

In concluding our notice of irrigation in Italy, we trust that our readers will derive a fair idea of its peculiarities therefrom. To those, however, who still further wish to investigate all the details connected with the system, historical, practical, legislative, and sanitary—to some of which we have but barely alluded—we have every confidence in recommending the volumes which have formed the basis of our present paper, as abounding in valuable information on these important heads.

R. S. B.

## A FARMER AMONG THE CHEMISTS.

## LETTER IV.

MY DEAR BERZELIUS,—How fast do you think the science of manuring would have advanced, had it never been proved, but only guessed, that all vegetables obtain carbon (principally, shall I say?) by their leaves? Depend upon it, the comparatively low value of carbonaceous matter as manure would not yet have been so generally admitted as you now see it is. But the old theory that a manure should be compounded according to the analysis of the crop, and supply each constituent in the same proportion in which the crop requires it, received a death-blow when it was found that some of the ingredients came spontaneously from the air, and were thus relatively unimportant, if not superfluous, in manure. Carbon, therefore, constituting nearly half the substance of plants, was at once dismissed, or permanently established in its humble place in the manure-theories of agricultural philosophers; and their speculations were shut up to the remaining elements combined in the fabric of vegetables as those in which the secrets of artificial productiveness mainly lie. In a similar manner, if the amount of nitrogen caught from the atmosphere in any form by the inhaling and absorbing leaves were once determined, do you not perceive that the problem of the quantity due to collection by the soil, or needful to be supplied to it, would be so much the simpler and easier, particularly when the added manure, and the various sources of loss, shall have been computed and allowed for?

I have given you this analogical view of the advantages of knowing how much nitrogen enters through foliage, in order to supplement some remarks in my last letter: let me now strike into some other intricate path in the maze of agricultural theory.

Accompany me into the region of field-experiments with manures: only look well to your steps, lest the perplexed and involved statements and results entangle you; and take heed to your head, lest the cannonade of criticism and disputation should shatter it. But, ere we bury ourselves inextricably in "Liebig and Lawes," I must tell you how amusing you chemists often are, when talking of the quantity of certain substances supplied to land, and the proportions of them fixed in the crop. You sometimes speak as if sowing a manure—strewing your powder upon the surface, or even drilling or ploughing it in—were analogous to depositing cash in a reliable bank. It will be taken care of, all enter into the economy of the establishment, and appear again when it has been utilized and worked up into a profitable form. The doctors used to talk in the same strain about the operation of large quantities of medicine, never thinking for a moment that possibly all the physic forced into the stomach might not enter into "the system;" whereas, now-a-days, we hear of very minute doses being efficacious, provided the quality and character of the medicine be suited to the disease. If

quantity makes comparatively little difference with respect to substances actually taken into the bodies of animals, do you think that a few pounds and ounces of manure, distributed without a pretence of intimate admixture upon hundreds of cubic yards of soil, can be reckoned upon as sure to show themselves in the substance of plants growing therein? The roots of a crop seem about as likely to find and partake of your "dressing," as the wireworms were to meet with the arsenic and brickdust proposed by your old acquaintance to be ploughed under every furrow as their poison. Only think what a place your manure is put into! Why, if you were a tiny insect just visible to the naked eye, instead of a man of some pretension in bulk and stature, you might traverse the interstices of a consolidated soil as though you were wandering through the levels, and ascending and descending the shafts of interminable mines; or were climbing among mighty caverns, looking up into dark and impenetrable recesses, and down into many a stupendous bottomless abyss. Grains of guano scattered upon the surface, or tumbled into some of these fissures, would appear like isolated boulders; some washed bodily downward for great distances by the rains which pour down the gulfs and chasms, and all gradually melted and carried down in solution. The solution, streaming and percolating, would undoubtedly be found hurrying principally down the wide cracks and gaping chasms, or the large shafts sunk by those deep miners, the worms; while only a portion would be absorbed and taken into the finer crevices and pores of the masses of earth, where Professor Way's minute per-centage of double-silicates lie ready to seize the ammonia from the liquid, or where fine rootlets are waiting thirsty for the draught. You cannot surely imagine that every portion, or even a large proportion, of the water holding the manure in solution or suspension, is exposed to contact with particles of soil in the act of merely sinking through a few inches of staple! Why, a starch-maker cannot bring all the particles of a mass of starch into contact with the chemical liquor in which he immerses it, without breaking up the soft pulpy mass and stirring and churning it for hours. Were he to trust merely to letting the liquor filtrate through the starch, very little indeed would be acted upon; the liquor would excavate or wash away certain channels for its passage, leaving the intervening portion of substance unmoistened. Granted that comparatively little ammonia may find its way into deep underdrains; but still it may—and I should say, *must*—be largely carried down and locked up in the land at depths very far out of the way of being readily and immediately available by the roots of young plants. Then there is some likelihood that the roots of a plant, clever as they are at finding and laying hold of a favourite morsel, may not light upon *all* the manurial food which may be left within their reach. And I really think that a great agricultural experimenter ought

to think of such sources of loss as these, before he proceeds to infer, from the small proportion of ammonia-manure recovered in a crop, that there has been a great waste by *evaporation through the plant*. Is it not just as probable that the lost ammonia never obtained an entrance into the plant at all, but most of mechanical necessity have gone down to enrich the subsoil which our shallow methods of tillage will not allow plants to reach without difficulty?

Again, consider, Berzelius, what a dressing of manure really amounts to. By entering into a little calculation, you will find that 2 cwt. of guano per acre contains no more ammonia (at 17 per cent.) than is equivalent to a film covering the surface of the ground, about the *ten-thousandth part of an inch* in thickness. To say nothing about evaporation, how much of this infinitesimal application must be washed far into the recesses of the subsoil before the rootlets of the crop have so meshed the upper stratum of soil as to arrest the fugitive substance in their tentacular embrace? But even if the ammonia, be supposed by a marvellous activity of the earth's absorptive and chemically-combining properties, to be all seized and stored up in the

upper soil, who can tell *how long a time* is needed before it can all be made available for whatever purpose it may serve in the direct nutrition or preparation of the mineral food of plants? Clay lays hold of ammonia with wonderful rapidity; but it is not so easy to make it leave go again; and as far as I have yet learned, I believe that ammonia is very slowly given up from its union with the particular earths or minerals forming its keepers in a soil. May not part of the loss experienced in ammoniacal manuring be due to the soil's imprisoning in idle durance a great portion of the volatile and evanescent ammonia which has been missed by roots, and escaped being washed or exhaled away? At any rate, it is found that the surplus of ammonia, which a crop has failed to find and feed on, is not actively useful to the crop which follows.

The more I consider the physical constitution of the land, the currents of water and air in constant circulation through the interstices, and the minute proportion of manure which can induce an augmented though temporary fertility in an immense mass of earth, the more I wonder how the rootlets of our crops manage to assimilate so much of an artificial dressing as they do.

Yours, &c.,

J. A. C.

## DEEP-LAND CULTURE.

Of the "innovations" now attracting the attention of agriculturists, "steam culture" possesses a peculiar interest. Should the difficulties which beset this important subject be overcome, the farmer will find in it a power which will throw in his way facilities to an amazing extent, not only to perform quickly and economically the ordinary modes of cultivation now in use, but to test the value of that system to which sound theory and successful practice alike point as likely to be productive of the most important results—namely, that which has for its object the cultivation of the soil to a greater depth, and its pulverization to a finer state than is even now contemplated by our most go-a-head of farmers. Before entering upon the question of steam culture and a consideration of the "philosophy" of the plans by which it is proposed to carry it into effect, we propose taking up a short space, to glance at the system of deep-land culture; to note what are the prospects its adoption holds out to agriculturists; and to advert to some points of interest closely connected with it.

As to the value of a thorough pulverization of the soil, agriculturists long divided, are now fast approximating in opinion. Few, indeed, are ignorant of the immense advantages resulting from allowing the atmospheric influences to act upon the soil; but some still incline to the opinion that it may be carried too far, more especially when in combination with thorough drainage—this opinion being held in consequence of supposing that in the case of heavy rains the soluble matter will be washed-out and conveyed to the drains, which thus, in point of fact, will act as sewers to carry off fertilizing matter from the land, in the same way as street drains carry off the exuvise of towns. This objection—important as at first sight it appears—is at once met by the able and valuable investigation made

into the absorptive powers of the soil by Professor Way. The results of this our readers are doubtless acquainted with; suffice it to say, that the experiments fully proved the power of the earthy particles of the soil to absorb alkaline substances of all kinds which might be passed into it through the agency of manures; this absorptive power of soils being greatly aided by atmospheric influences. The fact, moreover, is also deduced from those experiments, that unless the alkaline solution—resulting from the action of the soil and atmospheric influences upon the manures—has free access to all parts of the soil to which the roots of the plants can penetrate, this absorptive power is not fully developed; and the manure in its condition as originally applied to the land is then apt to be washed into the drains. If we find, under certain favourable circumstances, the roots of plants extending to a great depth in the soil, we may without deducing too much from this fact, draw the conclusion that this extension of root is a condition favourable to the health and productive growth of the plant, and that where the soil will not permit this extension, the growth is proceeding under conditions to some extent prejudicial to its productive progress. Mr. Stephens puts this matter in a very clear light, in the introduction to his work on DEEP-LAND CULTURE.\* "In common practice, the surface soil devoted to the use of plants seldom exceeds seven or eight inches in depth, and of that space a good manuring of farm-yard dung occupies a considerable proportion. This, assisted by a special manure, stimulates the growth of the roots of the cereal plants to an expansion beyond what the

\* "The Yester Deep-land Culture—being a detailed account of the method of cultivation which has been successfully practised for several years by the Marquis of Tweeddale, at Yester;" by Henry Stephens, F.R.S.E., author of "The Book of the Farm." Blackwood, Edinburgh and London.

space of soil allotted to their growth affords room for. Roots in a confined space, supplied with manure, become crowded together, decline in health, and their growth is checked. The plants may still bring forward their produce to a fine degree of quality, but it will neither be so large nor so valuable as the manure bestowed and the labour spent on the soil would warrant the expectation of. Whence, then, does such an unexpected disappointment arise? From the subsoil, though thoroughly dried, being left in a hard state. Were it in a state of pulverization, like the surface soil, the roots, whenever stimulated by the manures, would strike down in every direction into the subsoil; and the more they were encouraged in growth, the longer they would become; their fibres would increase in numbers, and they would stretch out and reach the bottom of the pulverized subsoil; the crowding of the roots in the surface soil would be entirely avoided, and the baneful consequences of loss of health and stuntedness in growth in the plant would be replaced by vigour of stem and leaves, strength of constitution, and capability to yield the largest quantity of produce. Were farm-yard dung buried deep into the pulverized subsoil, and the embryo plant encouraged in the pulverized surface-soil by means of a special manure, the limits of the growth of the entire system of the plant—stem, leaves, and roots—would then only be restrained by the power of the local climate, or the general character of the season." And what is here stated by so excellent an authority to be true of the cereals would be also true—and perhaps exemplified in still more striking results—of the root crops.

The depth to which soils should be stirred up and pulverized is, apparently, therefore to be decided by motives of economy and the capability of our mechanism, rather than by any question relating to condition of soil. For the objection often brought forward against systems of subsoiling and deep ploughing, that the mixture of the sub-soil with the surface-soil deteriorates the quality of the latter, is one which experience would seem to indicate as founded upon conjectural notions rather than well-established facts. At all events, at the Marquis of Tweeddale's farm at Yester, where deep-land culture has had a most complete trial given to it, this objection seems to have met with a most direct refutation. On this point Mr. Stephens, at p. 52 of the work already alluded to, thus remarks:—"Most people, who have witnessed this subsoil-trench-ploughing on the Yester farms, believe that the mixing of the surface soil with what appeared to them a bad party-coloured subsoil, would poison the surface soil for the future; and on this supposition a very general prejudice has been raised against the operation, amongst farmers. Such apprehension might reasonably be entertained in bringing up a large portion of subsoil in undrained land prior to the sowing of a white crop; but retaining such an apprehension against the subsoil of thorough-drained land, at a proper period of the rotation—namely, prior to a grain crop—is mere prejudice, because it is not sanctioned by experience. On the contrary, experience has proved the innocuous state of the subsoil in those con-

ditions. For two seasons the young grass seemed to suffer on Yester Mains, and the injury was ascribed by the workmen, in consonance with the common prejudice, to too large a proportion of the subsoil being brought up at once; but in reality it was rather to be imputed, in both seasons, to the want of time that should be allowed for assimilation of the soil and subsoil, and also in a great degree to the want of a sufficient quantity of manure. The apprehension of injury arising from a bad subsoil is more prevalent in England than in Scotland; but the feeling has certainly been engendered and maintained by the injudicious employment of the subsoil of undrained land. Where any iron exists in the subsoil of undrained land, it is in the state of a protoxide, which is soluble in water and is always injurious to vegetation; but wherever land is thoroughly drained, the protoxide is converted into per-oxide by the action of the air, and being insoluble in water, is rendered innocuous to vegetation." We see from this how intimately connected are the three grand modern improvements—thorough drainage, deep cultivation, with complete pulverization of the soil—all tending to the complete development of the plant, and all tending to increase its produce.

To introduce easily and economically-worked implements, by which these important desiderata can be obtained in the ordinary practice of agriculture, has long been the aim of the most enterprising farmers. Amongst those who have devoted a large portion of their time and no small expenditure of money to the successful solution of the problem of deep-land culture, the name of the Marquis of Tweeddale deserves the most honourable mention. For many years he has perseveringly carried on a well-devised series of experiments, or rather practical operations, resulting in laying the foundation of "a mode of farming so very different from what is in ordinary use, that it would deserve to be called a New System."

Of the principal features of this new system, how they are practically carried out, and what are the physical and commercial benefits derived from it, we propose to give a short review.

\* In giving a brief notice of the system of deep land culture introduced by the Marquis of Tweeddale, it will be as well at the outset to glance at the peculiarities of soil and climate of the farms where it has been so successfully inaugurated. From this it will be perceived that there has been nothing very favourable in either the one or the other to lead to the supposition that the success of the system has been from other causes than principally the excellence of the principle upon which the improvements are founded. As already hinted at, at the conclusion of our last article, the system has peculiarities altogether distinct from those of other plans previously introduced; so much so, that it may be said to be entitled to "rank as a new discovery."

The Yester Farm under the immediate control of the Marquis consists of three—Yester Mains, Broadwoodside, and Danskine. They are all situated in the county

\* "The Yester Deep Land Culture," by Henry Stephens, F.R.S.E. Blackwood and Sons, Edinburgh and London.

of Haddington, and slope from the extensive range of hills known as the Lammermoor towards the north. Their elevation above the sea is considerable, Danskine being as high as 750 feet, Yester Mains from 400 to 500, and Broadwoodside about 400 feet above its level. As regards the fall of rain and the temperature of the district, the former, notwithstanding its proximity to the hills, ranges a little higher than the average of the lower part of the county, and not more than for the east coast of Scotland. As to the latter, a series of observations showed that during the "vegetating season," extending from March to October, the mean temperature was 49 deg.; and for the "non-vegetating season," from November to February, 35.75 deg. "In spring the air is cold and dry when the wind is in the east; in summer the rainy points are the south and east; whilst the west wind always brings fine weather. The weather seldom sets in mild till the end of June."

The soil of the Yester Mains farm, before its improvement was effected, was to a large extent "poor, wet, moorish surface, resting on a stiff, retentive, sandy, clay subsoil." The remainder being "the home farm of the family," has been long in cultivation, and is rather more loamy, although its subsoil "was also a poor, stiff, sandy clay, of various colours—black, white, red, yellow, blue, and green—the blue being a very tenacious clay." Numerous boulders are found in the subsoil—some so large as to require blasting; while moorband-pan was also found in it. Of this farm, 504 imperial acres in extent, 444 acres have been thoroughly drained and sub-soiled.

The farm of Broadwoodside, 228 imperial acres in extent, all of which have been thoroughly drained, sub-soiled, and trench-ploughed, had a soil divided pretty equally into poor, stiff, sandy clay, and stiff tenacious clay, with a subsoil of poor stiff clay of various colours, and abounding in boulders of all sizes.

The third farm, Danskine, yet to be noticed, 235 acres in extent, had a soil in one part of "poor, stiff, sandy clay," and on the other "poor, stiff, hard clay, with patches of bog interspersed here and there. The surface soil was generally from five to six inches in depth, and seven or eight inches would have reached the subsoil through the deepest part of the soil. The subsoil was poor hungry clay, of various colours, and contained many stones, with much moorband-pan. Below the stones and the pan the subsoil was of a more open nature than that in either Yester Mains or Broadwoodside."

The moorband-pan above-mentioned, as found in all the three farms, was of two kinds, fine and coarse-grained—the latter cemented together in a black ferruginous matrix. It was generally found about eight inches below the surface, and although in many cases it yielded to the plough, in others it had to be broken up by the hand-pick. Exposure to air or frost soon resolved both kinds to their constituent parts: more than a year elapses, however, before the pan moulders away. Although thus capable of incorporation with the soil as they rose in masses to the surface, they were, along with the stones, carted off the land.

Before the improvements were effected, these farms, thus possessed of a by no means propitious climate or a generous soil, gave miserable results. On Yester Mains even, which, in the possession of its owner, was always subjected to better cultivation than the other two, the "winter wheat was generally thrown out; and so miserably deficient was the grass in most of the fields, that on walking across one of them, only a few useful plants might be seen. As a pasture it was not worth half-a-crown an acre." The other farms were in no better condition as regards paying properties, Broadwoodside being valued at 7s., and Danskine at 10s. an acre overhead, when they came into the Marquis's possession.

Of the value of a system which has changed all this—which has raised the worth of the land fivefold—enabled its produce to compete with that of the best farms of a district avowedly one of the best-cultivated in the kingdom—lessened the cost of labour—obviated the necessity of using numerous and costly instruments—hastened the ripening of the crops, and added greatly to their value—and brought other minor advantages in its train—little need be said in its favour. The results are the best proof to the farmer of its practical value, and yield a strong inducement for him to thoroughly investigate the principles on which the system is founded, and the mechanism by which these are carried out. This thorough investigation is not for us here to enter into; we can only give a slight sketch of the system adopted, glad if this sketch will prompt the reader to make an acquaintance with the "chronicle" so clearly penned by Mr. Stephens, and which we need not say abounds in those practically useful hints and deductions which characterise all this writer's productions.

Thorough-draining is the basis of the Yester deep land culture system, as indeed it is, or should be, of all land improvement. At Yester Mains thorough draining was begun in 1832. The depth of the drains was equal to 33 inches from the surface, or 30 inches below the bottom of the open furrows of the rounded ridges. The distance between the drains was 18 and 30 feet; those at the former distance rendered the land drier than those at the latter; but the latter distance was found to answer well enough. The main drains were four feet deep. Horse-shoe tiles and soles, made at the tile works on the farm, were used for both classes of drains. On Broadwoodside farm, the depth of the main drains was 4 feet, the subsidiary 33 inches below the crown of the ridges, the distances being 15 to 28 feet. The draining on this farm was begun in 1842, that on the Danskine in 1845. The main drains on this latter were of the same depth as the others, the subsidiary 30 inches, distances 18 feet. Tiles and soles were used at both farms. On the three farms, 881 acres were thoroughly drained, at an average cost of £5 9s. 6d. per acre. Following the arrangement laid down by Mr. Stephens, the next point to be noticed is the "deep-ploughing of the soils and subsoils." On commencing the system, the ordinary plough of the country was used, this giving a depth of 10 inches with two, and from 12 to 14 with four horses. But the tendency of the plough,

while working at the latter depth, to come to the surface, thus involving labour on the part of the ploughman, and the accidents to the tackle when stones were met with, showed that some other form of plough was necessary—a plough, in fact, which would ensure a “descent to the depth of 14 or 15 inches, with a power of clearing itself at that depth of the furrow slice.

To ensure a form of mould-board which would give these advantages, practical experiments were carried out with “so much perseverance, that the altered mould-board was worked in the afternoon, arising from the trial of the alteration in the course of the forenoon.” The result of these experiments was the “Tweeddale Plough,” which with four horses clears a furrow of from 15 to 16 inches in depth and 14 in breadth with as much ease to men and horses as the common plough is worked up with two horses in a depth of ten inches. “The secret of the matter,” says Mr. Stephens, “seems to be, that the improved mould-board, instead of pressing against the furrow-slice, separates it at once from the land-side with its breast, which is the only point of resistance, and causes it to slip along a straight inclined plane from the point of the sock to the ear of the mould-board, on reaching which it falls away by its own gravity. Friction against the mould-board is thus in a great measure avoided. \* \* It cuts the furrow square on the land-side, and makes the sole flat and smooth. Two men go with the plough, while four horses are employed in it. \* \* To show the ease of holding this plough, some men can temper the irons so as to enable it to go from twenty to thirty yards without anyone holding the stils.”

For drawings of this plough, and full instructions to enable any mechanic to make it, and for the method of yoking the horses, we refer to the work of Mr. Stephens’.

But satisfactorily as the Tweeddale plough did its work—unequaled, in Mr. Stephens’ opinion, for presenting the soil in the best possible state to the action of the atmosphere—it did not realize all the expectations of the Marquis. An implement was wanted by which to stir the tenacious party-coloured subsoil, and at the same time “raise it with a large proportion of the surface soil, thereby rendering innocuous a subsoil which would otherwise have proved deleterious to vegetation.” This implement was obtained after some experiments; it is founded upon Read’s four-wheel subsoil plough, but by the “substitution of a new sock and inclined plane for the old share, the Marquis soon converted it into the Tweeddale subsoil trench plough.” For working drawings and detailed descriptions of this implement see the work, pp. 46-49.

The Tweeddale plough formerly described, and the subsoil trench plough, are worked in conjunction: the former goes first, with its four horses, cutting its furrow fifteen or sixteen inches in depth; while the latter follows, completing a furrow of from nineteen to twenty-two inches in depth. “Thus this subsoil trench plough affords all the requirements of a perfect trenching to the ground, namely, to stir the subsoil effectually under the level of the plough furrow, to retain the chief por-

tion of the subsoil, in the form of mould, in its original place, and to mix any required proportion of the subsoil converted into mould with the original surface-soil. This mode of treating the soil and subsoil by means of these two ploughs has a great and remarkably immediate effect upon clay soils, and hard and tenacious clay subsoils. The upper soil being dry—which it should always be, where subsoil trench ploughing is to be executed—on being mixed with the damp subsoil below, the latter becomes immediately drier, and both soon assume a uniform degree of moisture.”

Mr. Stephens claims for this system of subsoil trench ploughing a pulverizing and mixing effect superior to spade husbandry. “The subsoil trench plough raises up a portion of the subsoil by degrees, and rubs it against a corresponding portion of the upper soil laid over on the furrow-slice by the plough that has gone before; and on the subsoil losing the support of the inclined plane of the subsoil trench plough, both sorts of soil fall together over the ends and sides of the incline upon the bottom furrow; whereas where soils are mixed in trenching, by men, with the spade, masses in spadefuls are placed together side by side, and not innumerable small portions of mixed loose mould. A great difference exists between a mixture of spadefuls and that of loose mould.”

Of the classes of subsoil, “sandy” ones are most easily effected by this system of deep-drill culture; “pure clay” the longest, “gravelly” and “thin clay” holding the middle place. No rule can be given with certainty as to the time when this trench ploughing of the subsoils should be renewed; it has, however, been decided on, “that the Tweeddale plough should be employed to cross-plough, in the autumn, the stubble land intended for green crops in the ensuing season, to the depth of fifteen inches, at the end of every rotation of fives.”

Passing over the practical notes as given by Mr. Stephens, on a variety of points—as the treatment of boulders met with in ploughing, the arrangement for saving time, working strength, &c., &c.—we proceed, in conclusion, to glance very briefly at the physical and commercial benefits resulting from the establishment of the system at Yester Farm.

We have already adverted to the mean temperature during the vegetating and non-vegetating season, before subsoil trench ploughing was carried out. Very complete investigation showed that, after it was adopted, the advantage in favour was 2° during the vegetating, and 4° 25’ during the non-vegetating season. The mean temperature throughout the year was raised 2° 75’ by thorough draining and trench ploughing. For many other points connected with this department, we refer the reader to the work itself; and as to the economical results, space prevents us from giving more than a mere outline. Stubble may be once ploughed in autumn, and left thus all the winter, requiring no further work till spring. Labour is thus saved, and the poaching of the land prevented to a great degree; deep-rooted plants are cultivated; the soil is completely pulverized; less manure is required; the air and rain permeate the soil



and subsoil with ease; the rain is better filled and ripens sooner, and the roots of the winter wheat protected from the frost in the deep subsoil. For full information on these and other interesting points we refer the reader to the work from which we have gathered this faint outline of "a great work in agriculture;" for grain in its conception, in its working out, and in its realization, undoubtedly it is. That a careful perusal of the work, or a full investigation of the practical working of the system on the Marquis of Tweeddale's estate, will convince the reader and inquirer that this

high character is not altogether undeserved, we fully believe, and that the patriotic endeavours of his lordship are not unworthy of the eulogium passed upon them by Mr. Stephens. "When a grand system of cultivating the soil is discovered and established, through the instrumentality of great labour, the discoverer may justly feel proud of it; but when the discoverer immediately, on establishing his system on a secure basis by his own experience, proffers it for the use of every landed proprietor and farmer that chooses to adopt it, the discovery is elevated to a national importance."

## A CHAPTER ON FENCES.

SIR,—In the management of landed property, whether the party be the owner or only the occupier, nothing can be done in the way of improvement until the plots of ground, whether large or small, are securely fenced; and when we read of the vineyard "that had the fence thereof broken down," the idea is conclusive to our minds of its being utterly ruined.

On every farm the winter store is separated from the summer feed by a fence, and is thereby secured from untimely eating: it is therefore evident that for the protection of property good fences must be maintained.

Where the ashler-stone wall can be had it silences all complaints, and stands in no need of paint or repairs for half a century. But as districts that abound in stone are frequently short of earth, it is often as much as 25 per cent. upon the value of the land to put up good stone fences on it; hence we find all sorts of expedients resorted to as substitutes for walls.

By far the most beautiful fence in ordinary use is the hedge; and if I were to say a word against it, I should have a host of demurrers to the doctrine that a *quick-set* hedge could have a fault: but the truth must come out, and that is this, that *quick-set* hedges are in reality a very *slow-set*, and, like most slow movers, become rather expensive—firstly, because the erection of a white-thorn hedge on level ground requires two lines of fences to protect it for years from the browsings of beasts, and to prevent their trampling its tender limbs to death; and as I have never seen anyone realize hard cash in open market for the clippings or other produce of his thorn hedges, I should really feel some scruples of conscience before I forwarded the culture of an article that required much good land to grow in, and could not be sold when it was grown.

The culture of beautiful thorn trees for their graceful forms and gaudy flowers, is quite another affair, and does not belong to fencing.

The next fence that I mean to notice here, is that made of strained wire; for I pass over the ditch, dyke, and ha-ha or sunk fence, as pieces of absurdity when committed on agricultural property of no ordinary kind, and count upon such working their own cure in time on the same principle that "wasters come to want."

Wire makes by far the cheapest fence of any. It is easily erected, requires little painting, having a very small body, so small indeed that it is usually styled an invisible fence, separating property into all sizes of plots,

yet leaving it as a whole, and to all appearance at least from a distance, as an open common. How grievously disappointed sheep and neat cattle must be to find this shadow crossing their path, and confining them to a small parallelogram, when, to all appearance, "the world was all before them where to choose their resting-place." The strained-wire fence has too many good qualities not to have some drawbacks. Strange enough, in all these years I have never seen one that could keep cattle enclosed excepting when all was quiet, and they had not only peace but plenty, for the moment that any disturbing cause was introduced, the fence was of no further service, for the mountain-bred sheep would bound over it; the lambs would get under it and through it, and stray cattle would only be delayed by it till they got to rub against it or try some other device to destroy it. This visionary ghost of a fence reminds one of

"The nate little house built of weatherboard stout,  
That kept everything else but the weather clean out."

A respectable grazier going to see his cattle one morning met his own bull in the lane with the field-gate upon his horns giving chase to another bull. Now I wonder how long a strained-wire fence would have detained these two domestic animals?

The hurdle, whether made of wood or iron, is really the staple fence of the practical man. With hurdles he pens his sheep upon the pasture or tillage, and protects property of all kinds upon his farm, orchard, garden, and homestead, by merely setting up a line of hurdles, and when that line has served its turn he takes up his hurdles, and the place where they stood has neither been disfigured as a greensward, nor made uneven for the plough in tillage; and it must not be overlooked that this secure fence has scarcely occupied an inch of land. And if the hurdle fence is not a good one, it is the fault of the owner, and not the fault of the style of fence; for an iron railing may be seen enclosing lions and confining elephants just as securely as if they were caged canary birds.

The hurdle of the present day is decidedly the most barbarously rude article that has descended to us, and I think it is high time to give this good old servant a hitch forward in the march of intellect. The head of one iron hurdle coming in close contact with the head of the next, just prevents the paint or gas tar from getting to them, and this, seemingly, for no better reason than that the connecting bolt should be as short as possible. When

hurdles are put down along a level line, say the base of a field, and on turning the corner at right angles to carry the line up a steep incline, the hurdles will begin to show either A or V, and at every wavy turn, either up or down the same A or V, will tease the planter, for the stiff geometrical form of an iron hurdle is stereotyped to stand erect only where the ground is level, and only where it is so will the hurdle turn all corners correctly.

An ordinary iron hurdle has 5 prongs, namely, 2 at each end, with a knee connecting, and 1 in the middle, and taking these five prongs at 1 foot each, and the two knee-pieces at 9 inches each, we have the footing of a hurdle 6ft. by 3ft. requiring  $6\frac{1}{2}$  feet of bar iron for its holding. Hurdles can scarcely be put down without straining them in some part, for the five points have all to be attended to, otherwise the prongs will go wrong; and the line or direction of the fence to be made, as well as the vertical and horizontal lines, have all to be studied in the planting of this iron wall, to prevent its being unsightly.

But this is not all, for the very nature of the hurdle seems to demand that it be portable, and not only so, but easily removed. Now when we consider what a five-pronged iron hurdle is like, with all its crooked knees and dagger points, a cartload of such is really something to feel alarmed at, not to speak of the labour necessary to drag hurdles out of the earth and load them into carts. Thus far I have spoken of iron hurdles, but the wooden hurdle for all practical purposes has just the same faults as the iron one, and after its own clumsy fashion will admit of the same remedy. When a wooden hurdle is made, its bars either are or ought to be at right angles to the head-pieces and morticed through them. Now if this hurdle is placed for driving, and one of the head-pieces receives a blow and enters the earth, say six inches, it either must go in crooked, or else every mortice will have to sympathise like the slings of a parallel ruler, for it is utterly impossible for one leg to be down and the other up, and all the right angles of the bars and head-pieces remain intact. It is therefore evident to common sense that the hurdle and its holdfast ought to be separated since they cannot be combined without one part working the destruction of the other. Wooden hurdles ought not to be pointed or have any prongs for insertion in the earth, but be made like so many field-gates; neither is the pole to be pointed that is put into the earth to connect the hurdles, but to have a hole bored for it by an earth auger, just as a carpenter would bore a hole in a piece of wood to receive a pin. This boring has been suggested for hurdles years ago, and is the simplest and easiest way by far of getting the work done, and it is very easily seen how injurious the pointing of a stick is when you want it to hold fast. Who would think of pointing a gate-post, or of driving one? I have taken all this trouble to convince the practical man that his own good sense went with him to the field-gate, but forsook him when it came to the hurdle. Ah, he will, no doubt, say, "But who can afford long iron-bolts and screws to connect hurdles to upright columns of wood?" Now I have never seen a piece of oak used for a round in a ladder of larger diameter than  $1\frac{1}{2}$  inches,

and they are usually little over an inch in diameter, and upon the good faith of their strength we have all ventured life and limb at great elevations. Therefore let the hurdlemaker try a pin about the size of a ladder stave, and if it is rightly shaped it will hold like a rivet, and can be done and undone at pleasure; and failing these, the farmer has still left the twisted twig with which he binds his brushwood, the "green withes that were never dried," with which Samson was tied when he went astray. The object of this paper is not to teach hedge-carpenters how to make wooden hurdles, but to enable gentlemen employed in planting trees to fence them from cattle by iron hurdles, so that the hurdles themselves may be ornamental as well as useful, and I do not intend here to give illustrations, as I have no interest whatever to serve in the matter: and when the thing is clearly pointed out, agricultural implement makers will not be slow in illustrating and greatly improving my ideas, it being their delight as well as for their interest to turn their work out of hand handsomely, by showing not only wood-cuts but actually iron hurdles that shall lie on the ground or on a cart as flat as if they were mosaics, with no more horns or claws than a building of brick would have, and the holdfasts to be made like the trident of Britannia, as exhibited on a George the Third halfpenny, so that hurdles and holdfasts may be packed in bundles like ordinary goods, and instead of a few hurdles occupying a space on a cart like a load of hay, they will form a very compact mass, and enable a load to be made of them with ease. In ascending or descending, or in other words, in going over hills or through hollows, in planting hurdles, I propose iron balls with a hole through each to be used as washers, not uselessly, but actually adding their length to the line of fence, each holdfast to have at least one between the head of the hurdle and the holdfast on each side; through these balls, as well as through the heads and the holdfast the screw-bolts pass; and in all cases where the vertical and horizontal lines require it, more balls are used like strings of beads, and thus the ornamental character of the fence is maintained and rendered workmanlike without any of those A's or V's above mentioned. In making the iron hurdles for horses and cattle the strain is on the top rail, whereas in making them for sheep the strain is on the bottom rail. Now we all know that the joint is the weak point in a hurdle, and therefore the fewer weak points that we make the better. Dismiss then, hurdlers, from your minds all ideas of cutting or joining that can be avoided. Therefore in sheep hurdles make the bottom rail of the same piece as the two head-pieces, and save these two joints and two cuttings, but let the rail part be set on edge and the head-pieces flat, so as to have one twist at each corner. And in the case of ox hurdles, let the top rail be the same as the head-pieces, and turned on edge like the bottom rail of the sheep hurdle. But I must close this letter, for it has grown on my hands from a mere notice to a long letter, and I must refer those to my address, who want further explanation.

I remain, yours respectfully,

100, Quay-street,      ALEXANDER FORSYTH.  
Manchester, March 7th.

## FARM BUILDINGS.

SIR,—I observe an article in your journal on farm steadings, which contains much of the views which I have carried out practically. I take the liberty of enclosing an article which I wrote for the "Encyclopedia Britannica." Since then I have given plans for several steadings, which have answered admirably, and they are now becoming quite common in this district. Indeed, the old plan is abandoned universally throughout this county; and I have been employed to draw plans for farms at a distance, one of which of large dimensions I have just sent off for the home-farm of Poltulloch in Argyleshire. Being the first to introduce these covered-in steadings on a uniform and compact plan, I had the honour of Prince Albert's commands to go and show a specimen to him.

The first one which was put up was on my own property in Wigtownshire three or four years ago, which has been visited and approved of by many practical agriculturists. Should you ever come as far north as this, I will be glad of a visit from you, and to show you some of these erections.

Hoping you will excuse my making this communication,

I am, Sir, your most obedient servant,

JAMES COWIE.

*Mains of Haukerton, Laurencekirk, March 14, 1857.*

## FARM BUILDINGS,

(FROM THE NEW EDITION OF THE "ENCYCLOPEDIA BRITANNICA").

After the article was partly put to press, we became aware that the two gold medals offered by the Highland and Agricultural Society of Scotland, and the best plans of farm buildings for large and small farms, had been awarded to Mr. James Cowie, Mains of Haukerton. From the novelty of the principle adopted by Mr. Cowie, and the skillful manner in which he has worked it out, we felt desirous to include an illustration of it in the present treatise. This he has kindly enabled us to do, by placing at our disposal specifications and descriptions of plans. Plates No. 14, 15, and 16.

"The plan, No. 1 (plate 14), is calculated for a farm of 400 acres, and can be erected at a cost of about £1,200, exclusive of carriages. I have given full sections and elevations along with a ground plan of it, accompanied by full specifications, which will enable readers to understand it fully, and in fact to make it available and ready for tradesmen to work by, if required. Notwithstanding, to those not accustomed to judge of buildings from drawings, a few explanations may not be unacceptable, as leading to a more ready understanding of the arrangements. It will be seen that the two granary lofts upper and lower, are attached to the sheaf-loft and corn-room. The division between them can be made to shift, so as one can be lessened or enlarged as may be required. The adjacent house has, in the ground-floor, a boiling-house and hay or grass shed, which may extend above the water-wheel to the corn-room wall. The floor above can be occupied as an auxiliary sheaf-loft or granary, or for erecting machinery for bruising corn or other

food, &c. The straw barn is placed in the centre of the building, and allows two kinds of straw to be deposited separately. The hay shed and infirmary, when not occupied, can serve as a store for straw or chaff if need be. The turnip sheds are placed quite adjacent to the cattle, which can be fed from a small waggon on a railway, by the arrangement adopted here, in nearly half the time required by employing the common wheel-barrow. The sheds or boxes for the loose cattle are placed four feet below the level of the rest of the interior, and are immediately behind the stalls, so as to admit of the dung being removed from the tied-up cattle with the least labour. The cow-byre is in a separate division, and the calves house is in proximity to it. The stable which has two doors opening externally for more ready access to the horses, is conveniently situated as regards proximity to the boiling-house, corn-room, straw barn, dung-shed, and cart-sheds: and there is a room provided over the turnip-shed for a sleeping apartment for the persons in charge of the cattle and horses. There are two large loose boxes, carpenter's shop, pig styes, an ample tool house, and an enclosed shed, which is capable of containing two carts, or can be employed in a temporary way as a guano or potato house. The poultry house has a yard, part of which can, as occasion may require, be staked off as an exterior area for an invalid beast requiring fresh air. The saddle-horse stable and gighouse may be simply referred to in concluding the description. This steading thus embraces within a comparatively compact circle, all the conveniences required for a farm of the size specified; and it is not the least recommendation to it that the farmer can see almost at a glance, in any part of the interior, all his 10 or 12 horses, his 50 stall cattle, his 60 shed cattle, and his 30 or more calves; and from the position of and ready access to them all, he can at once see how they are supplied with food and litter. The whole homestead with its contents, live and dead stock, are in fact as much within the visible scope of its owner, and manual access of the servants, as anything of the kind can or requires to be.

"The plan, No. 2 (plate 15), is that of a farm on the small property of Calvannen, in Wigtownshire. It was built last season, at a cost of about £500. It has three roofs; and the arrangements, which are similar to those in the plan just described, will be understood by a reference to the accompanying plans and sections."

"SPECIFICATION FOR STEADING OF FARM-OFFICES,

"*Mason Work.*

"All necessary excavations will be performed by the tenant.

"The walls will be founded at the depth shown by the sections, or as much more as will ensure a firm and solid foundation. The contractor must satisfy himself as to the extent of the necessary depths, as no addition will be allowed for extra building.

"The foundation-courses of the walls are to be laid with large, flat-bedded stones, laid close together, and their joints hard-packed with stone-shivers and lime mortar, and

having a toe or ledge from 3 to 4 inches broad, projecting beyond the thickness of the walls on each side. The walls are to be of good coursed and well-banded and packed common rubble-work. The stones composing the outside course are to be well axe-dressed on the face, and to have beds of not less than 7 inches of breadth, and not to exceed 12 inches in height, having headers laid in each course at from 5 to 6 feet apart, extending at least two-thirds the thickness of the walls, and the whole to be particularly snecked on the outside, and back-snecked. All corners, outband door and window rybats, to be 26 inches in length, and squared on the ends; and inband rybats to go through the walls; and the whole to have heads not less than 8 inches broad. The rybats of the large doors will have checks  $1\frac{1}{2}$  inches by  $2\frac{5}{8}$  inches on the outside all round. All other doors opening to the outside will have checks  $1\frac{1}{2}$  inches by  $2\frac{1}{2}$  inches; and the other door and window-rybats will have checks 2 inches deep, and one inch check on the lintels. All the corners of the buildings, door and window rybats, soles and lintels, tabling and put stones, and arch stones, are to be well droved and jointed; and the pillars of the cart-sheds are to be close-jointed, and all rybats to have a margin 3 inches round the outside faces, and on each of the external corners. The heel-posts of the byres are to be of stones 3 inches square, to be well droved, and to have a groove cut in each  $1\frac{1}{2}$  inches square, for the travis-boards, and to be well sunk in the ground (2 feet at least), and to stand  $3\frac{1}{2}$  feet above the saddles, as shown.

"The feeding-troughs of the byres are to be raised above the causewaying 6 inches, and bottomed with well-droved and jointed stones; and the wooden posts of the stable and byres are to have proper stone bases. The urine under-drains are to be laid with glazed socket-pipes to communicate with the urine-tank, as shall be pointed out.

"The internal walls of the corn-room, sheaf-loft, and granaries are to have one good coat of plaster; and the walls of the same are to be beam-filled between the couples.

"Such of the houses and passages as shall be pointed out for causewaying shall be done in a proper and sufficient manner by the contractor at the rate of threepence per yard.

"The foundations of the underground wall of the ark are to be laid with large flat-bedded stones, all well-laid and packed; and the whole of the water-walls are to be of well-sized stones, squared up, axed on the face, and well-jointed, and to have full beds, and built in courses, and every third stone to be a header of at least 2 feet in length. All openings are to have squared-up scuncheons. There will be a projecting course laid at centre, 9 inches thick, and at least 1 foot 9 inches in breadth, well droved and jointed. The bottom of the ark is to be slabbed with good quarry-stones, and the tail race through an arched opening 3 feet square, the thickness of the wall. The size and form of the stones for hanging the machinery, and all the necessary cuttings, boring, and levellings, &c., must be executed at the sight, and to the satisfaction, of the mill-wright or inspector.

"All the lime for the building is to be of the best English shells, well slacked, and made into a strong composition of mortar with clean sharp sand; and all the

joints of the outside work are to be well ripped out, and pointed with Scotch lime-mortar, in a proper season; and the ark is to be pointed with Roman cement.

"All necessary raggles are to be made, window-frames bedded and pointed in, and the lead and the running-in of the hinge-crooks of the doors, also the laying of the urine-pipes, and all inferior jobs necessary for the completion of the mason-work, must be done at the sight, and to the satisfaction, of the inspector, without any additional charge.

#### *Carpenter's Work.*

"Safe lintels throughout the buildings to have 1 inch of thickness to every foot of extreme length, and to have 9 inches of wall-hold, and closely fitted up to the outside stone lintels. All inside doors to have wood lintels.

"Joists and sleepers to be laid as shown, 18 inches from centres. Joists to have 9 inches of wall-hold.

"To have one row of trimmers in centre, 10 inches by 1.

"Mill beams to be laid as shown, to have 12 inches of wall-hold; to be double-morticed, and fixed with a  $\frac{3}{4}$ -inch joining bolt.

"The main couples or wide roofs will be framed as shown, and secured at the joinings with iron plates; the rafters to be placed 21 inches from centres, checked at joinings, and securely nailed.

"The wide roofs will be supported by cast-iron columns, as shown. These columns to have large bases and capitals, and to have 6 inches diameter at the centre, and not less than  $\frac{5}{8}$  inch thick of metal, fixed at the top to a dressed beam 11 inches square, and let into the stone base at the bottom  $\frac{1}{4}$  inch. The other roofs to be framed up as shown—roofing to be checked at joinings, and properly nailed.

"Slate-lath to be nailed on to answer slates 16 inches by 8 inches, or as near to that size as can be conveniently got.

"Gutters between the roof to be formed as shall be shown; all to be properly bracketed up and laid with ploughed flooring.

"Luffer-windows for granary and ventilators to have frames 3 inches by 2 inches, boards one inch thick, and made to open and shut with a rod and wood brackets, as shall be shown.

"The window frames to be two inches thick, and to be made to open on pivots 12 inches from the top, and to be filled with strong rough plate-glass.

"All the large doors to be in two halves, bound with four bars each, 7 inches by  $1\frac{1}{2}$  inch, and all to have margin stiles in both edges  $3\frac{1}{2}$  inches by  $1\frac{1}{2}$  inch. Covering to be  $\frac{3}{8}$  inch thick, ploughed, and all bedded on the joints. Each door to have two slipping bolts 18 inches long,  $\frac{3}{4}$  inch diameter, made to work on strong iron plates; hinges to be  $2\frac{1}{2}$  inches broad,  $1\frac{1}{2}$  inch at neck, and each hinge to be two-thirds the width of the door, and to have three screw bolts each.

"Corn-room door to be cut across the centre horizontally. All the other outside doors to be in one piece, and all to be framed on the backside with stiles and bars; stiles  $3\frac{1}{2}$  inches, bars 7 inches by  $1\frac{1}{2}$  inch. Each door to have four bars covered with  $\frac{3}{8}$  inch deals, either to be ploughed and bedded on the joints, or plain joints separated  $\frac{3}{8}$  inch between deals as shall be required; hinges 2 inches broad,  $\frac{1}{4}$  inch thick, and two-thirds the breadth of the door, and each to have a screw-bolt at neck. Such of the doors as shall be pointed out to have a sliding-board 9 inches square at

bottom, to admit air at pleasure. All the doors to have strong ring latches, and those on the outside to have home-made locks of the value of 5s. each, to be put on with three screw bolts each. Keys of the stable doors to have rings. The doors for granaries and sleeping apartments to be made similar to the others, but hung on posts with good hinges, and to have locks same as the others. All the doors, luffer and other windows to have three coats of white lead paint to be finished to a taint to be approved of.

"Crooks to be feather-tailed, pins for large doors  $1\frac{1}{2}$  inch, for small doors 1 inch.

"Mill-loft and granaries to be floored with  $1\frac{1}{2}$  inch thick deal, not broader than 7 inches, clean dressed on face, grooved and tongued, and nailed down with 1-lbs. spikes, and the bye-wood all cleaned off. Dressed skirting-boards fixed to the ducts round all the walls of the granaries, corn-room, and sheaf-loft, 7 inches deep and 1 inch thick.

"The mangers to be 16 inches deep, and sloped from the back to 20 inches, and in addition to have a 3 inch deal biting tree of hard wood. The front and bottom to have  $1\frac{3}{4}$  inch deal, the back 1 inch deal.

"The posts to be octagon, 8 inches diameter at foot, and 7 inches at top, grooved for traxis  $1\frac{1}{2}$  inch deep and 2 inches broad; to be fixed at top to a run-joint 7 inches by  $2\frac{1}{2}$  inches, with a large oak pin, and at bottom with an iron pin 5 inches long, 1 inch diameter. Front posts same size, split up the centre and similarly fixed. Posts and run-joints to be clean dressed.

"Hay-ricks to be fitted up in the stable 36 inches broad. The splits to be  $2\frac{1}{4}$  inches by  $1\frac{1}{2}$  inch, and to be 4 inches between. Rails to be 4 inches by 2 inches, and checked for splits, and properly nailed.

"Traxis to be 2 inches thick, to be clean dressed, close jointed, each joint to have 3 iron dowels  $\frac{3}{8}$ th in. diameter; and to be fixed between the front posts by screw-bolts. The gable walls to be lined the length of the stalls with 1 inch deal, ploughed and fixed to straps 1 inch by 2 inches. Traxis to be finished on the top with an ogee, and strapped with thick iron hoop.

"Harness-pins and saddle-rests to be fitted up as shall be pointed out, each post to have an iron hook for hanging harness. Two rings to be fixed into each post for binding horses.

"Two corn-chests to be fitted up in recesses in walls of stable, of 1 inch ploughed deal, 4 feet long each, 2 feet wide inside, and 3 feet deep; provided with proper locks and hinges. One corn-chest 3 feet long for riding stable, similar to the others.

"Fronts and backs of byre-troughs to be 2 inches thick and 12 inches deep, to slope towards the cattle, and rounded on the edge.

"Post to be fitted up as shown, to be fastened at bottom and top same as stable, to be  $5\frac{1}{2}$  inches diameter, champhered in corners. The front post to be grooved for receiving traxis, the other one to be in two, and traxis fixed to them same as stable. Run-joints to be 6 inches by 3 inches. Iron sliding rods 14 inches long,  $\frac{3}{4}$  inch thick, to be fixed in the posts with screw-bolts for cattle bindings.

"Racks to be fitted up 30 inches deep on the side next the cattle, and 24 inches on the other side. Same dimensions as stable racks, and fitted up in the same way, splits to be 6 inches between.

"Traxis boards to be  $1\frac{1}{4}$  inch thick,  $4\frac{1}{2}$  feet high at front, and 3 feet 3 inches at back; and front bar 5 inches broad and 2 inches thick, to be nailed to the front posts, and 2 feet above the edge of the troughs.

"Troughs to be made into proper lengths for convenience in shiting. Sides to be 14 inches deep and 2 inches thick; bottom  $1\frac{1}{2}$  inch, to be properly secured by longitudinal spars, nailed to bottom and framing. Frame 3 inches by 2 inches, and made to stand on feet. Width of troughs to be  $2\frac{1}{2}$  feet; all to be firmly nailed.

"One straw-crib to be made for each division of sheds. Posts to be 4 inches square, to have 3 rails on each side, 4 inches by 2 inches; to stand 4 feet high, 8 feet long, and 4 feet wide.

"Two traps to be made for corn-room, loft, and stable, of such length and dimensions as shall be pointed out.

"All scaffolding, centring, and moulds are to be furnished to the contractor for the mason-work. All inferior jobs not specified, nor shown in sections necessary for the proper completion of the carpenter work, shall be done without any additional charge, unless from its nature and extent such shall be allowed by the inspector of the work.

All the timber shall be of good Baltic timber or American red pine, and must be well seasoned.

#### "Scantlings of Timber.

"Sleepers,  $6\frac{1}{2}$  inches by  $2\frac{1}{2}$ .

"Joists,  $10\frac{1}{2}$  inches by  $2\frac{1}{2}$ .

"Rafters, narrow roof, 6 inches at bottom, 5 inches at top,  $2\frac{1}{4}$  inches thick.

"Baulks or ties  $6\frac{1}{2}$  inches by 2.

"Cross beam for thrashing mill, 10 inches by 14.

"Safe lintels for large shed doors, 10 inches by 10.

"Slate-lath,  $1\frac{1}{2}$  by 1.

"Rafters of main couples, 5 inches by 8.

"Tie beams, 9 inches by  $7\frac{1}{2}$ .

"King posts, 5 inches by 5.

"Spurs or anglers, 5 inches by 5.

"Purlins,  $5\frac{1}{2}$  inches by  $5\frac{1}{2}$ .

"Immediate rafters, 6 inches by 2.

#### "Slaters Work.

"The roofs to be covered with blue Welsh slates, size 16 inches by 8 inches; to have 2-inch cover or overlap, and all to be fair and closely laid. To be nailed to laths with nails weighing 8 pounds per thousand, steeped in oil when red hot, and each slate to have two nails. Skylights to be put in as shown, of strong sheet-glass of the size of 12 inches by 18 inches, fitted into zinc frames, weighing 16 ounces per square foot. The valley gutters to be covered with lead weighing 6lbs. per square foot, and 12 inches in breadth. The flat gutter between the roofs to be covered with lead weighing 6 lbs. per square foot.

"The gutter at the narrow ends will be 9 inches in breadth, and the lead to rise up on the roof the usual height.

"Gutters will have declivities of  $1\frac{1}{2}$  inch on every 10 feet of length, and to have boxes formed where shown, 5 inches deep; to have 3-inch lead pipes soldered into the same, and carried through the beam below into the cast iron columns. All the roofs to be upheld sound and water-tight for eighteen months after being finished.

"The carriages will be driven by the tenant, and the

contractor must supply all materials and work. The whole work must be performed by the day of in a most substantial and workmanlike manner, to the entire satisfaction of or any other person to be named by the employer. All necessary inferior jobs for

the completion of the work must be performed without any additional charge; and any alterations that may be made in the progress of the work, at the suggestion of the inspector, shall be paid for or deducted, according to his estimate."

## THE PRESENT CONDITION AND FUTURE PROSPECTS OF IRELAND,

RELATIVE TO THE EXPORTING POWER OF THAT COUNTRY AS COMPARED WITH THE PAST.

DEAR SIR,—Some weeks ago there appeared in your journal an extract from the *Waterford Mail* "On the Position and Prospects of Ireland." Conceiving that that document, although containing much truth, so far as figures go, is also fraught with erroneous conclusions, I have to request the favour of you to allow me a space in your columns, to give a clearer explanation of the causes of the present condition of that country, especially in respect to the decrease in the exportation of agricultural produce since 1844; and, in order to reply more explicitly to the article in question, I shall reduce it to the following distinct propositions, viz.:—First, that the social condition of the Irish (people) depends more on the physical condition of the country than on its political state. Secondly, that the Incumbered Estates Court has not *per se* benefited the country, but only in so far as the new proprietary or occupiers make the land more productive. And thirdly, that the decrease of the population between 1846 and 1850 is an evil, because less corn has been exported between 1850 and 1854 than between 1840 and 1844 inclusive. I shall consider each of the propositions as they are placed.

In the first I detect an egregious error, it being evident to every impartial observer that both the social and the physical condition of Ireland have been produced by the political state of the country for the fifty years previous to 1850. I assure you it is with no desire to rip open old sores that I refer to the wild and impracticable schemes enunciated by that extraordinary man who for half a century led the people as it were in chains, and by the power of his eloquence found easy means of extracting from the poorest of the people their twopence per week towards the "rint;" I refer to it to show what were the social effects of his political humbug upon the people, producing in the sequel all those physical evils which for the time converted what might have been an earthly paradise into a waste, howling wilderness, "the valley of the shadow of death."

But I shall possibly be called upon to prove my position, and I therefore anticipate the call. Let the reader fancy to himself the great body of British operatives, of all classes and professions, banded together in a political league, like the "Repeal Association" of Ireland, to follow the requisition of one man of gigantic mind in pursuit of an *ignis fatuus*, which he well knew would

never be reached, but which his infatuated followers firmly believed he would accomplish for them. See the cultivation of the field, the employment of the loom, the pursuits of trade, all forsaken to attend public meetings, sometimes held for days together, and the attendants numbered by tens and hundreds of thousands! and this continued without intermission for years together, until, excited by the spirit-stirring and incendiary harangues of their leaders, addressed to the basest passions of the human heart, it resulted in one universal desire to sever by violence the ties which bound them to the Government and the constitution, and thus to risk all by breaking out into open rebellion! What, think you, would be the effect of such a movement in England, upon the social and physical condition of the people? I reply, just what it was in Ireland. Agriculture, commerce, manufactures, were neglected to an extent an Englishman can form no conception of, and they consequently decayed to such a degree, that nothing but a decimation of the population could have compensated for it. The public mind was kept upon the stretch, and everything neglected but the visionary elysium of national independence, held up to view by a leader who well knew the impossibility of ever realizing what he promised, and the injurious consequences that must have ensued had he been able to do it. I happened to reside in Ireland during some of those crises brought on by public agitation, and can bear witness to the deep and lasting injury inflicted on the social and physical condition of the people by the continual harassment of mind and withdrawal of attention from the sober pursuits of life. The Irish peasantry themselves are fully convinced of this now. Although an excitable people, and easily led astray by political demagogues, when their minds become disabused they have discernment enough to see which way their interests run. For years after the escapade of 1848, which gave the death-blow to their hopes by its failure, a spectator, standing on the quay at Dublin when the emigrants were embarking, might hear the poor fellows cursing the very name of that leader who had led them astray after a will-o'-the-wisp; and ascribing all the evils of the country to the agitation he had created. Within six months after O'Connell's death, that name was no more heard mentioned in common conversation, than if he had never existed; and, I believe, to this day his proposed monument in Glasnevin Cemetery is deferred to "the Greek

kalends." I assert, without fear of being confuted by facts, that all the physical evils of Ireland are the result of its anti-social condition, and that this is ascribable to the political state in which the people have been held, which will appear still more clearly as we proceed.

The second position of the writer in the *Waterford Mail* asserts that the Incumbered Estates Court has not "*per se*" benefited the country. I do not know what he means exactly by the use of the words "*per se*" here. If he merely means that had the act never been acted upon, but remained an abstract and inoperative proposition, I agree with him; but if he means to say that the liberation of the land of Ireland to the amount of twenty millions sterling from incumbrances that rendered it absolutely worthless to all parties connected with it, and which has been effected *solely by the Incumbered Estates Court*, is not a benefit conferred by it "*per se*," then I differ materially with him. Suppose I see a man struggling in the water, and about to sink the *third time*, and I jump in and pull him ashore exhausted and insensible; but, taken to the receiving house, the man recovers, and walks home as hearty as ever; do I, or do I not, confer a benefit "*per se*" on that man? I am quite sure of this, that the Royal Humane Society would look at the case in a different light from the writer in the *Waterford Mail*, and consider *me*, and not their officers, entitled to the silver medal. And this is precisely the case of the Incumbered Estates Court. All the good that has been effected—and the *Waterford Mail* is compelled to admit the reality of it—has been the work of that Court "*per se*," and not incidentally. But let us examine a little into the details of the working of the Court, so much abused by some, and extolled by others.

There was a great outcry a few years since respecting the condition of the landed property of one of our first English noblemen in point of rank, which was considered to be so encumbered as to be beyond extrication otherwise than by bringing it to the hammer. The noble proprietor acted most honourably throughout the affair, and fully sustained the character of the class to which he belongs, for that uprightness in private life which distinguishes the highest ranks of English society. But what bearing, or what comparison has this isolated case with an immense proportion of the land in Ireland that has been turned over to the Incumbered Estates Court? I happen to have had many hundreds of the petitions to that Court for the sale of estates pass through my hands for examination, and can bear witness to the irretrievable condition to which the bulk of them have been reduced by the multiplied incumbrances heaped upon them, chiefly between the years 1790 and 1830, when land was high, and Ireland in its palmy state. Many of the estates were mortgaged for much more than their intrinsic worth, and some had been in Chancery for years, and would have remained there, as long as one shilling of their value was left to be shared by the lawyers. I have seen petitions for the sale of estates

on which mortgages, settlements, dowers, &c., &c., reached the number of one hundred, or one hundred and twenty; the amount of the whole being far beyond what the fee simple would fetch. To such a state were these properties reduced by the reckless principle on which many of their owners acted, that they were of no use whatever either to them, their tenants, the mortgagees, or the country at large. They got into Chancery, a receiver was appointed over them, and in most cases the law expenses absorbed the whole proceeds. As the Court of Chancery could grant no lease, except "*for seven years or during the suit*," all improvement or proper cultivation of the land was effectually barred. In many parts, squatters settled themselves upon them, and defied the civil power either to turn them out or make them pay rent; whilst the reputed owners, compelled to absent themselves, were either living abroad, or serving in the English army, or knocking about in this metropolis to obtain employment under the Government.

From this fathomless abyss the Incumbered Estates Court has drawn them up, and by a judicious division of the properties has made the purchase easy to men of moderate means; whilst the expense of transfer under the Court was small, and gave the purchaser a parliamentary title "*good against the whole world*." Nothing can better prove the beneficial working of the Court—to the owners as well as to the creditors of an estate—than the fact that nearly half the petitions for the sale have been put into the Court by the owners themselves. I recollect one instance of an estate in Galway, I think, the proprietor of which received only three hundred pounds a-year out of a rental of four or five thousand, the rest being paid to mortgagees and other incumbrancers. He was wise enough to place the estate in the Court; and the result was, that after selling enough to pay off the whole of the incumbrances, he had enough left to yield him *twelve hundred a-year*, instead of three hundred as previously! Was this, or was it not, a benefit "*per se*" of the Court? There can be but one opinion on the subject.

Thus emancipated by the Incumbered Estates Court, and by that alone, the land of Ireland has passed into the hands of a proprietary or of occupiers who have both the means and the disposition to make the best of it. If the returns of the exports of corn have not shown the improvement, it is not because cultivation has been neglected, as the *Waterford Mail* insinuates, but because *cattle paid better than corn* up to the year 1853. The consequence was, that thousands of acres were laid down with grass, and the breeding and grazing of cattle and sheep have been sedulously attended to. Now, however, that we are likely to have remunerating prices for corn in future, another change is taking place, and we hear that the pastures are again broken up and sown with wheat; so that we may look for increasing quantities of that grain in future from thence.

But another cause exists for the small export of wheat from Ireland of late years. When the potato failed, the

people were driven to the use of Indian corn and wheat, and now that the decrease of population (of which I shall presently speak) has raised the value of labour, the Irish peasantry, having acquired a taste for other food than potatoes from necessity, use it from choice; and in future they will live on cereal food more and more,

so as to absorb a large portion of their own growth, as they have of late years. But I must leave the last proposition of the *Waterford Mail* for another letter, having already in this reached the bounds I had prescribed to myself.

Yours, &c.,

London.

VERITAS.

## AGRICULTURE IN CANADA.—HINTS TO EMIGRANTS.

NORTHUMBERLAND, NEWCASTLE DISTRICT, CANADA WEST, 26TH FEB. 1857.—We are passing through a winter of a most peculiar character for Canada. The wheat was covered by snow in the latter part of November, after a most favourable growth and general appearance. December brought us continued showers of snow, with a cold so intense as is rarely experienced here before Christmas; the thermometer ranging as low as 34 degs. below zero, and for many days together never marking above that point. This continued also through January, without our accustomed January thaw. It was singular during the clearer days of this period to see the vapour steaming from our lake into the cloud region as from a seething cauldron. In the early part of February we had, however, a sudden and complete change. Thick mists and heavy rains carried off the snow in flooding torrents, doing much damage in the course of the larger streams. With the temperature of June, often through the night reaching 56 to 60 degs., the snow disappeared in a very few days, and the frost came out of the surface to the depth of 4 or 5 inches, the wheat looking everywhere most beautiful. This weather continued nearly three weeks without any night frosts of consequence, until a level cover of snow has again completely enveloped our fields, and the wheat plant, which would have been in great danger had bare frosts supervened, is again safe for the present. Of course we can conjecture little as to the future; should pretty severe weather again come on, and bring a late spring, our fall wheat prospects will be most encouraging; should moderate weather, with little snow, keep the surface bare, there is room for most serious injury. Except for a short period in January, when a great deal of wheat was bought at 7s. 3d. to 7s. 6d. currency per bushel, our supply has been rather slow, but our farmers seem now anxious to realize at present prices—7s. 3d. The sample is in general excellent; but our friends the Americans, as usual, draw off all our best lots.

Our Government, in anticipation of a considerable immigration from Europe in the coming season, is making careful inquiry in the various localities as to the number of labourers and mechanics who could find employment, with the view, as far as possible, of having them forwarded at once to these points. I notice, in a late *Express*, an inquiry on the subject of emigration to this country, and must fully approve your reply; perhaps a short notice from the field of action itself might not be unacceptable to those whom the pressure of competition in an old country may be leading to look in this direction.

First then, we would address more especially those connected with agriculture. If your business at home keeps you with any reasonable degree of exertion, stay there.

Don't emigrate, for the sake of your families: let them do it for themselves, the habits of the young are more easily changed than those of the advanced in life. Home is not the old fashioned thing it used to be. Canada will soon not be more distant than a county of England was yesterday. If you send your children, give them first a sufficient knowledge of some occupation by which they can hope, with their own exertions, at once to earn a living. All expect good wages here, and we cannot afford to pay and teach apprentices, where they won't be bound for any length of time to repay the trouble and cost.

You have determined to come however. Bring all the money you can muster, a few rough clothes (cotton or linen for summer, woollen for winter); no chimney-pot hats, no hob-nailed shoes, no implements, no furniture, all these things are cheaper and more suitable here.

You may use a feather bed or two on ship board, and they may be useful here, as well as some bedding. If you have a good common carpet, bring it, it may afford you comfort, but you can do very well without; as well can you dispense with much which you thought necessary at home; in your first steps at least. A pair of good hands, however, are your best capital, if joined with head to use them; but plenty of money can be profitably enough used here, though you can never farm on an extended scale. Put in your pockets the best testimonials of respectability you can get, we will try your abilities for ourselves. Bring also as many letters from parties having friends here as may lie in your way, such will provide you a hearty reception, and it will be hard if some of your referees do not prove good advisers.

Cast aside at present all notions of buying an estate, unless you have too much money; be content to rent, if you can get it, and not lock up your capital for the mere trifling return the escape from a low rental will afford you. An estate is not here the summum bonum—the source of everything good and happy and independent that it is in England, often quite the reverse; your necessary buildings and improvements to keep up with the times perhaps keep you ever in hot water to find the means to get them. A rich landlord to do these things is often very convenient, even although he be sometimes a little arbitrary; he is not so troublesome as a needy dun wanting money of you.

Take a steamer to Quebec; steerage fare £7 10s., cabin fare £15. If you take steerage fare, bring for yourself a few delicacies in the eating line; and try to join a party of a few acquaintances at starting. Don't forget to shake hands with the steward as soon as you are over the bar; on what you leave in his palm may depend some of your advantages in cooking, &c. If you take cabin passage you have only to guard against the gout or repletion. Twelve



or fourteen days will place you on Lake Ontario, until you drink of whose waters you need not think of delay.

The land is then before you. Choose for yourself; but take the first satisfactory engagement that offers. Jingle your purse to yourself in private, until you love the music, but you need not let others hear it. An emigrant does not need to appear rich to meet a good reception: and a newly arrived Englishman is generally too free to spend. Live rather considerably below than up to your means before you have a home.

Cleared farms let at from 15s. to 20s. per acre at from 3 to 10 miles from some town; leases seldom longer than 3 to 5 years. Hundreds of our farmers are doing well, but it is with what old countrymen would consider severe exertion and strict economy. We have no gentlemen farmers here—no, I am wrong, we have many, but they have to keep their farms, not their farms them. Agricultural skill and education come here to a bad market; you cannot farm extensively enough to turn them to profitable account. A hard working family of lads on a farm will earn you £70 or £80 a-year each as long as you can keep them, but if trained here they soon want to escape out of the nest. This is the poor man's country: in agriculture the middle classes are doomed to disappointment. The little farmer, who can turn his hand to anything, is the man we want. From two to four hundred pounds is as much capital as a renting farmer, without a large working family, can generally employ to profit, that is to say in farming without the purchase of land. If you purchase land you need a much more considerable capital beyond your purchase money, in order to effect the constantly exacting improvements in buildings, fences, &c., which a tenant here cares little about. You can thus start on small capital; but there is only one way by which you can expect this to do better proportionately for you than in England—that is by working harder and longer hours, and living more economically. If you adopt these plans you have before you a fair prospect of getting rich. We have here no quiet point of satisfied content, no landing-place on the steep hill-side, where a man can sit down and enjoy the prospect; but it is in the words of our old Yankee song, "Such a gitting up

stairs as I never did see." Your legs get tired, but there is no rest—on, on, on!

The country is beautiful, the climate weakening; farming labour makes the frame wiry and squalid, not robust and hale. Dysentery is one of the dangers of a new emigrant. Purchase at the druggists a few pennyworths of Dover's powders: take 4 to 5 grains every 2 hours on any such attack while travelling. Drink little water, as you are, in moving round, ever changing your source of supply. No grog. With care in such matters you will soon acclimatize. Try to arrive in May or not before September; I should prefer the latter season.

Those who have not been brought up to agricultural pursuits at home need not think they will do for farmers in Canada, where much greater manual skill and experience is desirable in the farmer himself than at home. Your labourers scarce know how to do any piece of work properly, and you pay them high wages—4s. to 7s. 6d. a-day at ordinary seasons: if you misapply a few such days' work in a small concern, the loss is serious; you must be ever ready and able to go through any difficulty yourself. If you have these qualifications, reader, come along. Don't be too close with us when you arrive; open out your history and your plans, we ourselves have all been homeless wanderers, and can feel for you. If you show us you are some decent body, I promise you the ready help of our most experienced practical farmers. You can always hear of such by inquiry at the local landing-places; and don't fear that a call of inquiry will be deemed an intrusion. An emigrant sees our most friendly face; we may look cold and selfish to each other, we always show a warm face to him while he smells of the old sod. The first six monthly numbers of *Hogg's Instructor*, 1856, published in Edinburgh, and taken by many of the English mechanics' institutes, contain some papers on the country which might be useful to an agricultural reader. Emigrant, if you come in my way, I shall be glad to help thee.

Farm labourers have now from £30 to £40 currency a-year and board; a good man of family about £50 to £54 and cottage, with potato-ground, fuel, and perhaps cow kept in summer. I speak in Halifax currency, 2s. 9d. of which is £1 sterling.

ROBT. HUME.

## A FARMER'S POLITICS.

The impending election of a new Parliament will suggest to every thinking farmer many thoughts of the future—the probability that in a very few short weeks his prospects for the next seven years may be fixed so far as respects legislative aid, or interference with his business. The next two or three short weeks is all the time the farmer now has to look about him, and to use his utmost endeavours to secure that candidate for parliamentary honours who is most likely to confer on him and the agricultural interest generally the greatest benefit. We live under a free-trade regimen now. It is not as in the olden time, when the fine old English gentlemen could rule and regulate things to their own will. The whole phase of the country has undergone a

most remarkable change. From being the first agricultural country in the world, and its agriculture by far the most important interest in the country itself, in which all classes were proud to participate, it has now given way to, and become partially superseded by, manufacturing industry and commercial enterprise. We fully believe that, in the superiority or quality of its agriculture, it is more pre-eminent than ever; and the increase in its productions has been the astonishment of all staticians. Our object, then, as farmers, must be to uphold it in all its importance and usefulness; for which purpose we ought to look out, and return men of transcendent ability and influence—such men as will give us effective aid in removing those peculiar burthens

under which agriculture labours, and to foster its interests, by preventing hindrances, and by the enactment of such salutary measures as are likely to aid its advancement. I shall name a few of these peculiar burthens and preventives for the farmers' serious consideration.

*1st. The Taxes upon Malt and Hops.*—These taxes require great amelioration at least; to say nothing of their total repeal. It is futile to say they do not press heavily on the land, and that the tax is paid by the community. I hesitate not to say that these taxes enhance the cost of management on my farm fully two shillings per acre. Is that nothing? Is it nothing that the poor labourer is debarred his draught of beer on account of its cost? I am of opinion that a reduction of one half of the taxes on these articles would increase the consumption amazingly—almost to compensate for such reduction. Why should not the poor man's beverage be cheap? Cheapen the poor man's drink, and put the tax upon spirits and wines instead. If we must have the tax, let the rich pay it: by no means the poor. Will it increase drunkenness? No! Is it not a fact that where malt is cheap, drunkenness is comparatively rare? The poor man ought to enjoy his daily pot of beer: it would strengthen him, and do him real service for labour. Quite as good and as important to consider as the Chancellor's Budget on this subject. Then look at the great increase in the growth of barley. Barley is now chiefly grown on barley-soils, as only the best qualities sell well, because inferior lots are not worth the duty and cost. Reduce the tax materially, and coarse qualities will then be malted in abundance. This will permit the profitable growth of barley on all soils. That none but rich men can be maltsters is a known fact. It requires great capital to carry on a moderate malting business. Hops, again, are only grown in a few favoured districts; chiefly because the restrictions and regulations are so stringent that few farmers take the trouble to acquaint themselves with the whole course of their management. Take off the duty and restrictions, and we should soon have hops in plenty. Growers would be found in every district, because they would be unfettered. Many farmers would grow little plots for their own and neighbours' service, and manage them in a very economical way in drying, &c.

*Taxes and prohibitions upon home-grown Tobacco, Beetroot Sugar and Spirits, Chicory, Hemp, Flax, Liquorice, Madder, &c.*—In this short paper I cannot take up these specific questions, but they deserve the best attention of every agricultural member, with the view to the removal of unnecessary restrictions, and the abolition or modification of the tax upon each article enumerated. Why is the talent and enterprise of the British farmer to be thwarted and snubbed by prohibitory restrictions, *local burthens*, poor's rates, constabulary rates or charges, county rates, highway rates, church rates, nuisance-removal charges, &c. These various rates and charges form a fertile source of legislative thought for a county member.

*Poor's Rates.*—This rate usually includes the charges for the maintenance of the poor, the constabulary, and county expenditure, each requiring the closest [super-

vision. The great question for consideration is that of *union ratings*. Under certain regulations it is unquestionably the best and cheapest course: some definite starting point or pivot must be fixed upon, so that each parish shall bear its relative proportion of the charges. This done, the union becomes one large parish, and is managed accordingly, without the petty squabbles often intruded into our board-rooms by guardians pleading on behalf of their respective parishes.

*County Rates and Constables' Maintenance.*—These would be far better under the supervision and control of elected guardians than under the magistracy, or rather their clerks.

*Highway Rates.*—The expenditure of these rates ought to be under the control or expended by a competent district surveyor, and not by annually-elected parish officers, who are mostly unacquainted with road-making, and are generally incompetent men, who seek the office for their own private convenience.

*Church Rates.*—These must be abolished altogether. Time was when it might have been fairly placed as an impost on the land, there being no other reliable source from which it could be drawn. But when population is increasing so numerously, it seems to me monstrous to continue such a burthen on the land for the express accommodation of the many who attend church. The burthen ought to be borne by that portion of the community participating in the advantage, and not by the landed property of the country. Why is the land or real property exclusively to find church accommodation for the great population of this country? Some other fund ought to be made available so that it is more equitably diffused.

*Nuisance Removals and Boards of Health Bills.*—These are effecting much good. Greater simplification is required, and more definite powers must gradually be given. These are modern measures requiring great attention.

*Tithes.*—This burthen I will show in my next is charged too highly. The pivot average is too high, and must be reduced.

*General Subjects.—Tenant Right.*—A complicated question, but of great importance to tenant farmers.

*Equalization of Weights and Measures.*—Equally complicated and highly important.

*Agricultural Statistics.*—This is a modern question for the Legislature. Why are we to be kept in uncertainty as to our annual produce, when other countries possess that necessary information and regulate their course of business by it?

*Extension of the Rural Franchise.*—There can be no good reason for withholding the franchise from any man who knows how to use it aright; but we must have some guard. Ten pounds rental is very well so far, but it will exclude many sensible men from that privilege. My space is full; I will enter more fully into these matters in my next paper. Farmers, look to your friends; return clever honest men who will advocate and uphold your true interests—men up to the times, ever watchful, never weary. Opposing interests do their utmost, and so must you. Be up and stirring.

## ON DISTILLATION FROM BEET-ROOT.

TRANSLATED FROM THE FRENCH OF M. BARRAL, EDITOR OF "THE JOURNAL OF PRACTICAL AGRICULTURE,"

(1)

We had not intended to occupy ourselves at this moment with distillation from beet-root, in spite of the importance which this branch of industry has assumed amongst a great number of agricultural operations. We were aware that numerous processes were instituted amongst the inventors of the different products of distillation, and we awaited the decisions of the tribunals upon the controverted points. In addition to this, a particular circumstance enjoined silence upon us. The tribunals of Cambrai and Vitry, in an action for piracy instituted by M. Dubrunfaut against Messrs. Lanfrey, Lefebore, and Co., in one case, and against Messrs. Bocquet and Co. in another, nominated a Commission of Survey, composed of Messrs. Dumas, Bussy, and Pelouse, or in default of one or more of these learned men, of Messrs. Peligot, Barral, and Jocquelin. It evidently became us to remain silent in presence of these facts; but Messrs. Dumas, Bussy, and Pelouse have given in their reports in the month of August last, and M. Dubrunfaut has had printed a long memoir, in which he has introduced us in a manner that it was impossible for us to allow it to pass without correction. On the other hand, a great number of agriculturists have written requesting us to afford them information upon the different processes of distillation, and they reproach us for not having fulfilled the obligation professed by our publication, of always sustaining the interests of agriculture, and of guiding, according to our ability, all the efforts of progress. If we consider, also, that from the decision which the tribunals are on the point of returning, it may result that all the proprietors of distilleries now established on farms may be liable to the penalties incurred by the infringers of the patents, and that all run the risk of being condemned in heavy damages and costs, which will ruin them—that, in short, the distillation from beet-root would become the monopoly of one single patent—we ought not to shrink from giving succinctly the advice demanded of us, and re-establishing distorted facts.

(2)

It is not in this place that we can discuss completely the long memorandum of M. Dubrunfaut; it contains not less than 244 pages of large octavo, of the closest text. If we are compelled to do it, we shall undertake that work of discussion in a separate publication. Besides, time fails us at this moment; for we ought to say that M. Dubrunfaut, who compels us to speak after a private conversation which he has had with us, has not sent us a copy of his memorandum, which he has distri-

buted with extreme parsimony, so that we have only read his work by chance, and in a cursory manner. It is, however, only consistent with the ordinary rules of good breeding, that when we inculcate a person in an affair, we ought at least to afford him the means of knowing what we have said of him.

However this may be, we belong not to those who wish to maintain that M. Dubrunfaut has rendered no service—has done nothing for the progress of industry. We do him the justice his services merit, and we have concurred in awarding to him some of the high rewards which have reached him. But that is a very different thing from granting him the monopoly which he claims. This is the question we are about to discuss, and shall avoid mixing with it any personalities: we may differ in opinion from an opponent without endeavouring to wound his feelings. In other respects, we have no reason to complain of the manner in which M. Dubrunfaut has spoken of us; but we do regret the bitter terms he has used in speaking of Messrs. Chevallier and Gelis, who differed from him in opinion.

(3)

M. Dubrunfaut asserts that they calumniate him when they say that he claims an exclusive privilege for the distillation of beet-root; we will add, however, that he wishes to extend that privilege to the distillation of Jerusalem artichokes, parsnips, and other analogous products. If this privilege were justly acquired by him in the conditions regulated by our laws, we should only be rendering him homage by recognising his rights, and we would be the first to require all distillers to pay him the two francs per hectolitre of alcohol, which he has fixed as his royalty; nor should we consider too large the annual payment of 600,000 francs that agriculture and industry would have to make him for the 300,000 hectolitres of alcohol from beet-root that are now produced in France. But we do not believe in the soundness of such a privilege; and we say that M. Dubrunfaut actually claims it when he pretends that his own inventions are pirated by all those who make use of sulphuric acid in distillation, whether they employ the juice obtained by the rasp and press, as do Messrs. Lanfrey, Lefebore, and Co., or by the process of Champonnois, or that of Leplay.

With respect to M. Champonnois, M. Dubrunfaut says: "He has only appropriated, in his patents and practical manufactures, the application of a principle and process, the property of which was guaranteed to me by the law. The differences which exist between his description and mine prove that he has badly understood

and digested the principle which he has undoubtedly borrowed from me." We have abridged much to avoid entering into the detail of all the accusations brought against M. Champonnois by his opponent. In the meanwhile, we shall take the following passage, which sums up the judgment of M. Dubrunfaut as to the real value of the claimed process:—"The Champonnois process," says he, "placed under the powerful protection of the house of F. Cail and Co., of Paris, who found there a large area for his manufactory, has had a reputation which it would be impossible to explain if it were not for the high influence of the parties who are found to be interested in the success of the undertaking. The basis of a large speculation, it has proved the occasion of great errors, great illusions, and undoubtedly great profits, which have accrued—not to the agriculturists who have worked the process upon the faith of the announcements, but to the practical manufacturer, who made that process the basis of their operations. Light will, one day or other, be thrown upon the real value of this process; we know, also, to whom belongs what is useful of it, and who will resume it in his own right of M. Champonnois."

In regard to what relates to the process of M. Leplay, M. Dubrunfaut expresses himself thus:—"He has only borrowed literally from us the principle and practice of distillation by bits; his method of distillation itself can be considered only as an improvement added to our mode of working, and in these respects his patents are in reality only insignificant, or even ridiculous modifications or changes applied to ours. In short, if they constituted improvements and progress, they would still rest upon the principles and processes of which the working is reserved to us until the expiration of the term secured to us by the law."

In short, M. Dubrunfaut pretends that the distillers who distil the juice proceeding from rasps and presses, commit the offence of piracy if they make use of sulphuric acid, or ferment it in a continuous manner without the addition of yeast. Thus we read in the Decree for the appointment of Surveyors by the Tribunal of Cambrai, "Dubrunfaut prosecutes Lanfrey and Co., as the chief of the pirates, which he determines by the use they make—1st, Of sulphuric acid added to the water which flows over the pulp at the moment of rasping, and which has the effect of preventing the alterations to which the non-acidulated pulps and juices are liable, of weakening the cells not torn in the process, and thus favouring their draining without prejudice to the advantages which result when that acid is added to the juice in certain proportions and conditions, which develop the natural fermentation of the beetroot. 2ndly, Of divers other operations similar to those contained in the patents, and certificates of addition which are attached thereto, especially the employment of wines or the recharging of the vats. 3rdly, Of the fermentation without yeast, and of a peculiar yeast by them prepared. 4thly, Of juice of beetroots acidulated in another manu-

facture, in order to be preserved during the transport, and afterwards furnished to the distillery."

What else is there beyond the processes we have enumerated, and which M. Dubrunfaut assumes belong to him? There remains only the previous boiling of the beetroots practised by M. Genot in the neighbourhood of Metz. It is on account of this method that M. Dubrunfaut brings us into the question in the following terms, the incorrectness of which we should condemn, even if the wording displayed all the greatest courtesy:

"A learned man," says M. Dubrunfaut, "as much distinguished by his erudition as he is by his worthy and honourable character, M. Barral, the editor of the 'Journal of Practical Agriculture,' having occasion to speak of the business of distillation from beetroots in 1853 and 1854, in connection with our works, deceived undoubtedly by the incorrect information which has been furnished to him by our adversaries, says positively that the distillation from beetroots has been practised for a long time in a continuous manner, and without interruption, in the departments of the Moselle and the Meurthe.

"In consequence of this publication we have had the honour of seeing M. Barral, and demanding of him upon what facts he supports his assertion relative to the ancient existence of distilleries from beetroots in the Moselle and the Meurthe. M. Barral, with that frankness of character which distinguishes him, confessed to us that he supported it upon the authority of the Genot distillery situated in the environs of Metz. It is necessary for us to say that in reply, founded on the preceding explanations relative to the Genot patents, we remarked, with good reason, to M. Barral, that the truth was precisely the opposite of his assertions. Indeed, was it very likely that M. Genot, a distiller of potatoes in the vicinity of Metz, should have applied in January, 1852, for a patent for the *exclusive privilege* of the distillation from beetroot, if that manufacture had existed and been practised from all time at his door, and under his eyes, in the departments of the Moselle and the Meurthe?

"The information that we have otherwise collected on this question has proved to us that before 1852 no distillation from beet-roots was in activity either in Lorraine or in Alsace, nor in any part either of France or any foreign country. We were therefore surprised at the scrupulousness of M. Barral in supporting, on the authority of the patent or the distillery of M. Genot, the ancient existence of distilleries of beetroot in Lorraine. They had, besides, furnished him, upon the entire subject of this manufacture, false indication and incorrect information, which have beforehand stamped with barrenness all the documents which this learned man has published in his journal upon distillation from beetroots; and if we had followed the advice of the Journal of Practical Agriculture in order to carry out that industry, laying aside our own experience, we should have arrived at a negative result, for the manufacture would neither have been

created nor acquired at this moment. Thus, M. Barral has recommended for distillation furniture the models published and known as the Derosne apparatus, constructed by the firm of Cail. He has religiously published the designs of this apparatus, which were behind the time in the progress of manufacture, and M. Barral is too erudite, too conscientious, and too much the friend of truth and progress, to contest these assertions, if occasion presents itself of discussing their worth."

## (4)

If an accidental circumstance had not brought these lines under our notice, M. Dubrunfaut might have reaped the benefit of our silence. People would have said that we had not replied, and that consequently we stood condemned upon all the facts advanced. It is always wrong to publish private conversations which one may be induced to utter, by the simple fact that we hold to a certain order of ideas which cause us to see the truth under a false colouring; and we render ourselves liable to commit errors arising from the blindness produced by self-interest.

Let us see, first, the manner of reasoning of M. Dubrunfaut. The passage which we have just copied is preceded by the following lines:—

"It was in January, 1852, that M. Genot demanded his patent, when alcohols were at the price of 64 fr. the hectolitre. The process of M. Genot was nothing more than the process patented by M. Lalenne-Delgrange in 1844, of which we have not spoken before, because M. Douay-Lesens, who purchased the cession of it from M. Lalenne-Delgrange, declares, in his patent of 1846, that this process and its acquisition have turned out an arrant fraud. In this respect, therefore, the patent of M. Genot is worthless, and the purchaser has only paid an annuity, renouncing voluntarily the working of a patent which he had reclaimed as one of principle and of process."

Well, when M. Dubrunfaut did us the honour to pay us the return visit, in the middle of 1855, at the period of the "Exposition Universelle"—a circumstance which leaves us in no doubt as to the date to which we refer, for he wished to accompany us up to the very door of the Palais de l'Industrie, in which we had been waiting for a sitting of the jury—we told him that we had recently visited the factory of M. Genot; that his process had worked perfectly well for three years, yielding important profits. We added that M. Genot had declared to us that he had renounced his patent, because he had discovered that he had been preceded in this district, and certainly in Belgium. In short, we maintained that at least four distilleries of beetroots existed in the Meurthe and the Meuse before the patents of M. Dubrunfaut.

Thus M. Dubrunfaut cannot be said to have proved that there have been no processes besides those which he declares to be his, by the help of which beetroots are distilled in order to produce alcohol; at least, that he pretends to be also the inventor of the fermentation of

the beetroot pulp. So, again, he cannot conscientiously say that the process of M. Genot is worthless, since it was asserted to him by us, and he has not denied it, that this process worked well for several years. If there is any identity between the process of Genot and that of Lalenne-Delgrange, that demonstrates that this last process is not without value.

We must also avoid all equivocation. We have never said that it is necessary to lay aside the indications of M. Dubrunfaut, or that they have exercised no influence on the progress of distillation. Still, we are decidedly of opinion that the invention of the employment of sulphuric acid has been placed by M. Dubrunfaut himself at the public disposal, and we think that that invention has in practice inconveniences sufficiently serious to render it desirable that it should be replaced by some other, producing juice less destructive of the apparatus of distilleries and of the pulps for cattle.

"The surveyors acknowledge," say Messrs. Dumas, Bussy, and Pelouse, "that at the time when M. Dubrunfaut obtained his patents, sulphuric acid had been pointed out as able to favour the fermentation of the juice of beet-roots. It is by M. Dubrunfaut himself that this indication was given for the first time in a work entitled '*The Art of Making Sugar from Beet-root*,' published in 1825, page 543. M. Dubrunfaut points out in this passage not only sulphuric acid, but also tartaric and oxalic acid, as capable of being usefully employed in the fermentation of beet-root juice. Whilst we cannot therefore grant to this simple announcement of a purely scientific fact, founded upon an experiment of the laboratory, the character and nature of an industrial process, the surveyors in the meanwhile consider this publication, even by its title of scientific generality, as sufficing to place at the public disposal sulphuric acid as an agent of the fermentation of beet-root juice, and as giving to all manufacturers the right of making it the basis of a patent for the production of alcohol of beet-roots. They are consequently of opinion that sulphuric acid as an element of fermentation of beet-root juice was known, and public property, at the period at which M. Dubrunfaut obtained his patent."

It is true that Messrs. Dumas, Bussy, and Pelouse have withdrawn with the left hand what they have granted with the right, by admitting that the particular doses indicated by M. Dubrunfaut in 1852, with the other conditions of fermentation described in his patents, may be considered as patent discoveries and inventions. We shall come again to that point presently, for it is an important point for the future success of the manufacture by agricultural distilleries, and there is a doctrine involved in it, the adoption of which would be attended with the most serious consequences.

We know that with the employment of sulphuric acid a yeast is produced even in the fermentation of the beet-root juice, which may be used to assist subsequent fermentation. On this point Messrs. Dumas, Bussy, and Pelouse express themselves thus:—"The production of yeast during the fermentation of beet-root juice was demonstrated in 1825, upon the occasion of the same experiments cited above, upon the juice of beet-

root put in fermentation by means of sulphuric acid. This is also a purely scientific fact, placed by the publicity given to it by its author in the public property of Science, whence it is lawful for any one to take it, and, if he is able to do so, transfer it to that of manufacture. In fact, a patent was taken out in 1846 by Douaile-Sens for the manufacture of beet-root alcohol, and in which direct reference is made, although collaterally only, to the formation of yeast and the possibility of utilizing it. This patent, merged into the public property, had, like the publication of M. Dubrunfaut, produced no industrial result to lead us to suppose that its manufacturing practicability was possible. The surveyors consequently consider that the yeast produced by the fermentation of beet-root juice, and its employment in aid of ulterior fermentation, were equally in the public possession before 1852."

The passage in the work of M. Dubrunfaut, published in 1825, which plays so conspicuous a part in the present question relating to the distilleries, is as follows:—

"A remarkable effect of sulphuric, oxalic, and tartaric acids upon the juice of beet-roots is, that if we place the juice thus treated under a temperature favourable to the alcoholic fermentation, it immediately enters with great force into that fermentation; whilst, at the same temperature without the assistance of the acid, it would become dark and glary. What is not less remarkable in this effect, is, that the liquid mass is covered with a coating of yeast having precisely the appearance, smell, and taste of the yeast of beer, and may, like that, be used as a powerful leaven for other fermentations. We might utilize this substance successfully, if we wished to convert the juice of beet-root into alcohol, and are aware that the advantage of this process would consist in procuring a very excellent alcoholic fermentation in the juice, without the employment of other yeast."

(5)

It appears very extraordinary that M. Dubrunfaut, in 1856, wants to inflict a rent of two francs per hectolitre upon every one who utilizes the plan pointed out by him in 1825 for the fermentation of beet-root juice. "I did not, in 1825, give the proportions of the agents to be employed; I gave only a part of my secret. It was only more recently, in 1852, that I discovered the several conditions essential to its success. *PAY!*"

This is the translation of the following word used by him in his conversation with us, which he was wrong to make use of without our consent. "For my part," said he, "I have not written over my door 'Chair of Instruction,' but 'Shop.' In my publications I never give sufficient details to render it unnecessary to have recourse to me. I call them my clients." To this we have nothing to say: it is right that those who make use of M. Dubrunfaut should acknowledge the personal services he renders them. But if they do not have recourse to him, if they rest themselves upon what is the property of the public—if they work with the elements which he himself has agreed to impart to them, we say that the manufactures thus raised ought to have nothing to fear of his exactions. If M. Dubrunfaut gave no proportions in 1825, there were other parties who

prescribed them afterwards; to prove which we shall only recite those of the patent obtained the 9th of December, 1838, by Messrs. Nicolie, Wattringue, Brougneart, and Mouray. Here we shall differ in opinion from Messrs. Dumas, Bussy, and Pelouse; but it is easy to see that these learned men have been guilty of an inadvertence which has led them into an error. In effect they say: "In this patent the acid is employed cold, in the fixed proportion of one-thousandth part, but simultaneously with a preparation into which enters the Marseilles soap, the effect of which should be to neutralise a part at least of the sulphuric acid; that preparation comprehends also saltpetre, flour of rye, butter, &c."

There is not a single distillery visited by us in which we have not seen a composition more or less analogous employed to precipitate the scum in fermentations. For fifteen hectolitres of juice the patent of Wattringue and Co. employs 1 k. 500 of sulphuric acid, and only 2 kil., or the twentieth, of a composition into which it enters; flour of rye, coarsely ground, 16 kil.; bean of wheat, 9 kil.; fresh butter, 1 k. 5; Marseilles soap, 2 k. 5; saltpetre, 1 kil.; boiling water, 20 kil. There is not, in the 2 kil. specified in the patent of Messrs. Wattringue and Co., enough to neutralise the hundredth-part of the sulphuric acid introduced. Thus, the objection has no value.

(6)

The proportion of one-thousandth part of acid for the fermentation of beetroot juice has been, as we have seen, for a long time public property. What say the patents of M. Dubrunfaut, taken out in 1852? The learned manufacturer thus resumes what he calls his new inventions: "I have shown," says he, "1st, that we can always weaken the cells of the roots with all kinds of acids; 2nd, that we can from thence macerate the weakest pieces cold, or make ferment; 3rd, that we can macerate the fermented pieces previously weakened by the acid; 4th, that certain proportions (one to two thousandths) produce the alcoholic fermentation spontaneously of the beetroot juice—that certain other proportions (from two to four thousandths) assist the fermentation, and the regularization of the fermentation in presence of yeast developed; 5th, that a proportion of two to three thousandths at most, liberates the juice perfectly, and preserves it during a longer or shorter period from all kinds of fermentation or alteration prejudicial to distillation."

This we do not haggle about with M. Dubrunfaut, but accept the summary of his works, such as he himself gives it, without attempting to discover if his patents have the distinctness of his recent memorial. But ought we to admit that, this summary being acknowledged correct, the consequence is, that whoever shall employ sulphuric acid in the proportions of one to four thousandths, the limits indicated above, will be a pirate? This is the question which concerns all the agricultural distilleries which now, to the number of 150 to 200 probably, employ sulphuric acid. Messrs. Dumas, Bussy, and Pelouse have answered "Yes," in what concerns the distilleries using the juice proceeding from the press, but

they say "No," for the distilleries worked by the system of Leplay. They have not yet been called upon to explain themselves for the distilleries on the system of Champonnois. The fundamental argument upon which these savans support themselves in giving their opinion on what relates to the privilege they assume they ought to grant to M. Dubrunfaut for the distillation of acidulated juices, is, that previous to 1852 that distillation—many times undertaken, and even patented—had been as many times abandoned. They produce, in support of their view of the case, two certificates; one, of a certain number of manufacturers of the North, declaring that before 1852 the distillation from beetroots was only known by the disasters resulting from the processes previously invented; the other, of merchants, commission-men, and brokers of alcohol at Paris, attesting that, previous to 1852, alcohols from beetroots were unknown at the bonding warehouse of Paris, or that it came thither in very small quantities, insufficient in any degree to disclose the existence of a decided manufacture. But is it not evident that it is the actual rarity of spirits of wine, and the high price of alcohols maintained for four years, which have allowed the manufacture to revive and establish itself?

Most of the former attempts have yielded before the sudden fluctuations and changes from high to low prices, as it is supposed the present beetroot distilleries will fall when the vine shall again successively yield an abundant vintage. Yet these distilleries having gone through the first period of trial, having passed through all the trials which all new establishments submit to, have many more chances of sustaining themselves than had the previous ones. It ought to be well understood that it is not in the best-arranged patents, but only in practice, that we can learn to manage well a fermentation. M. Dubrunfaut has had it in his power to render great services to manufacturers by his instructions, but that is all. In no respect do we find in his patents the true discovery of the proportion of sulphuric acid. He points out variable proportions, commencing with that indicated by Wattringen, by Cheval, and others. But how ought these properties to vary? M. Dubrunfaut takes as his rule of comparison the quantity of juice, and he says that we shall put from 1 to 2 to 3 to 4 of sulphuric acid to the thousand. But when shall we put 1 or 2? Upon that point he gives no guide to the distiller, who must judge what it is necessary to do from his own observation and individual skilfulness. In this respect there is still a discovery to make. If M. Dubrunfaut knows the secret by which, in a given quantity of beet-root, we can rapidly fix the proportion of sulphuric acid it is necessary to employ, he has not given it to the public in his patents. Besides, the quality of the beetroots varies in a factory from one day to another, according as they are brought from one field or from another; and also according as the season is more or less advanced, every day rendering a variation in the proportion of sulphuric acid necessary. Now, the distillers do not even know the proportion they employ, and act empirically; nor has any analysis in the processes used by

M. Dubrunfaut attempted even to fix the proportions employed by the manufacturers attached. These have been unable to make use of the means patented, in order to determine them, since those means are still to be indicated. We repeat that we know not how to act, except by an habitual glance or sleight-of-hand. Such are the considerations which lead us to divide upon this point from Messrs. Dumas, Bussy, and Pelouse. Let us add that the certificates of the merchants and manufacturers referred to above are wanting in exactness, that alcohol from beetroot had been sold more than once previous to 1852 in considerable quantities. A document published at Brussels, in 1851, entitled "A Treatise on Distillation," by M. Lacambre, speaks of the distillation from beetroots as of a business perfectly established in Belgium many years before. We have already ourselves cited, and shall continue to do so, the distillery of Genot, which has produced alcohol upon a large scale long before M. Dubrunfaut dreamt of re-suming from the public use what he had given to it twenty-eight years before.

For the distillers who make use of the Leplay process, we shall now recite the very expressions used by Messrs. Dumas, Bussy, and Pelouse, in which we shall find some indications which may serve for the defence of those who employ the Champonnois process, if M. Dubrunfaut puts in execution his threats against them.

"M. Dubrunfaut," say the learned Commissioners, "sets out upon this idea—that no fermentation is possible except in the juice; and he applies the process of fermentation directly to the juice itself. When he works upon the pulp it is still in reference to the juice which it is to supply; and, finally, when he employs sulphuric acid with the beet-root in pieces, we clearly perceive that it is to effect first the weakening of the roots, then their maceration, and, lastly, the fermentation of the juice.

"In the Leplay process, on the contrary, the production of the juice ought to be avoided with the greatest care, both before and after the fermentation. The spirit of the process consists in not producing juice at all, but in working the fermentation of the saccharine in the beet-root itself: all the details of the process tend to realize this theoretic condition.

"The addition of water, or a certain quantity of fermented juice, to put it in train, intervenes only to communicate the action of fermentation to the saccharine contained in the beet-root.

"The subsequent changes are made with the beet-root in pieces, always upon the bottom of the vat, without renewing the fermented juice, and by means of new portions of sulphuric acid added always to the same liquid.

"Without wishing to pronounce a judgment upon the relative value of the theoretic views which have served for the basis of these two patents, and without prejudging even upon the industrial value of the two processes, it is impossible not to acknowledge that the Leplay-process creates in some manner a new industry, and that it constitutes in every respect a new application, by suppressing in principle and in fact all the accessories requisite in the preparation and extraction

of the juice—such as rasps, presses, apparatus for the weakening and maceration—by replacing the distillation from the juice or pulpose matters in the shape of paste, by the direct distillation from fermented pieces.

“From these motives the surveyors estimate that, admitting that the processes employed at Sermaise are precisely those described by Leplay in his patent, there is no identity between the processes employed at Sermaise and described by Leplay for the fermentation of pieces of beet-root, to be afterwards distilled, and those previously reserved for the certificate of Dubrunfaut of the 10th of February, 1853.

“The only important point of real contact which exists between the process of Leplay and that of Dubrunfaut, is the employment of sulphuric acid, which in both is the essential and indispensable element, up to the present time, of a good fermentation. In the employment of sulphuric acid, there are two things to be considered:—1st, the acid itself, as the agent of fermentation; 2ndly, the mode of using it, and the proportions in which it is needful to use it, in order that its action may be as beneficial as possible.

“As to what concerns the employment of sulphuric acid, the surveyors admit that it has become the property of the public by the publication of 1823 issued by M. Dubrunfaut himself, in the passage recited in the discussion on the art of manufacturing beet-root sugar. We have therefore to consider the mode of using, and the proportions.

“The surveyors admit that the mode of application, and the proportions indicated by Dubrunfaut, whether for the direct fermentation of the juice, or even for that of pieces, as he practises it for the weakening and maceration, are not necessarily applicable to the fermentation of the pieces directly as Leplay executes it; that it was not possible to conclude that the proportions employed by Dubrunfaut were the same that it would be proper to employ in operating continuously upon the same liquid as the agent of fermentation, as is practised by Leplay; that that remarkable fact, pointed out and utilized by Leplay, of what may be called the indefinite conservation of the fermentable property in the beet-root juice by the successive addition, indefinitely repeated, of the sulphuric acid in presence of the pieces, could not be foreseen *à priori*, nor deduced from the patents of M. Dubrunfaut; and that it imparts to the system of Leplay a seal and a character peculiar to it alone. For these reasons the surveyors are of opinion, that the process of Leplay may be adopted and practised without encroaching upon the processes claimed in the patents and certificates of Dubrunfaut.”

This learned discussion alone demonstrates the small value of the assumed discovery made by M. Dubrunfaut of a certain proportion of sulphuric acid, beyond which nothing would be practicable; it proves that in admitting the right of Dubrunfaut to special proportions, it is necessary to ascertain whether any other process of dis-

tillation employs the same proportions; and it follows, as we have stated above, that we have still, as a preliminary step, to discover the means of determining, a certain amount of beetroot being given, what exact quantity of sulphuric acid will be the most proper to apply in order to extract the alcohol.

Our readers must acknowledge, after the facts which we have placed before them, how difficult it is to answer the numerous questions which have been put to us, upon what processes we could recommend them to adopt. Could we with propriety involve them in a course in which they would run the risk of encountering all the embarrassments of a long and doubtful law-suit? Thus we are very often condemned for not giving solutions of questions which we do not possess. Be it observed, again, that we have not spoken of the existing law-suits upon distilling apparatus, in which contradictory judgments have been pronounced.

With regard to the fermentation of beetroot, our decided opinion is that it is now freed from obstructions by the placing at the public disposal, in 1825, of the using of sulphuric acid, and of the proper yeast produced during the fermentation of the beetroot. If the processes described so accurately in 1825 by Dubrunfaut have not been entered upon until recently in industrial practice, that only proves that alcohols have not sustained so continuous a course of remunerative prices as to render the distillation from beetroot generally profitable. Its present success does not prove the discoveries to be recent. Undoubtedly the merit of M. Dubrunfaut is not less great; but he cannot now be recompensed by a direct premium upon distilleries. If we admit the contrary, that would conduct us to perpetual patents; a system maintained by some persons, but which we look upon as bad, and, in every case, contrary to our laws. We should vote for all the rewards that can be proposed for M. Dubrunfaut, in all circumstances in which our advice is required; but we do not believe in the validity of the privilege he claims.

In conclusion, we cannot help remarking how much better the agriculturist understands progress than the manufacturers. When the former discovers a new mode of cultivation, when he conceives a plan of increasing the produce of his fields, or the profits of his stables or cattle-sheds, he hastens to show to everybody what he has done; and his most exalted ambition, his only reward, is to see it imitated. The manufacturers, on the contrary, for the most part, combat for insignificant details, which they hasten to patent in all that relates to progress. Still more, if a manufacturer more generous than his brethren does not take out patents for the improvements he has effected, but delivers them gratuitously to every one, it is sure to happen that some other person patents his inventions, and compels him to pay him a premium for their use, or, at the least, to run the risk of a prosecution for piracy, the issue of which is always doubtful.

J. A. BARRAL.



THE CHEESE MARKET AND MANUFACTURE.

Cheese, as a food and a condiment, is in general use in all countries where it can be easily obtained; and its varieties are innumerable — from the globular Dutch and the hard horny Suffolk skin, which often requires an axe to cut it, being so hard “that pigs grunt at it, dogs bark at it, but neither of them dare bite it,” to the cream, and rich Cheddar and ripe Stiltons. Old Fuller tells us that poor men eat cheese for hunger, and rich for digestion. This may be so; but be the uses what they may, cheese enters largely into consumption as an article of diet, and, our home production being insufficient for the demand, the foreign imports are necessarily large. Various estimates, founded on the supposition that two-thirds of the population will each consume three-quarters of a pound of cheese annually, bring up the home production to 100,000 tons, which, added to the foreign imports, gives a total consumption of cheese for the United Kingdom of about 120,000 tons.

Little or no cheese is made in Ireland, and but a small quantity in Scotland. The chief English cheese counties are Cheshire, Gloucester, Salop, and Derby, where fully three-fourths of the whole quantity of British cheese is made.

When we consider the nutritious properties of cheese as pointed out by chemical analysis—showing that it stands considerably higher in this respect than butcher's meat—we cannot wonder at the large consumption, which outruns our home manufacture. It is, moreover, an article readily available for food, requiring no subsequent preparation, and easily kept. The cheaper and commoner kinds, therefore, become a considerable article of diet among the agricultural population, and containing 31 per cent. of flesh-forming constituents and 25½ per cent. of heat-giving substances, it affords much sustenance to the body.

London and Liverpool are the chief ports for the reception of foreign cheese, but large quantities go also to Scotland, especially to Leith and Dundee. The value of the foreign cheese imported exceeds one million sterling. Of 19,064 tons imported in 1855, 15,550 tons came from Holland, 3,459 from the United States, and small quantities from France, Sardinia, Tuscany, and other parts of the Continent. The round Dutch cheeses are well known and largely consumed here. The cheese prepared for exportation in the Italian States being kept in brine, is excessively salt, and is only preferred as a condiment for macaroni. It fluctuates

in price from 12s. to 30s. per Sardinian cantar of 93lbs.

In 1850 there were produced in the United States 113 million pounds of cheese, and this enormous product was nearly all required to meet the demand for home consumption, the total export there amounting to scarcely 9 million pounds. The foreign exports of American cheese have, however, been declining, for in the fiscal year of 1855 the shipments were under 5 million pounds, valued at £103,000. More than three-fourths of the entire shipment came to England. Strange as it may seem, the imports of foreign cheese into America were at the same time on an extensive scale, amounting to upwards of one million and a-half of pounds. France sent the largest supply across the Atlantic—more than one million pounds; the Germans sent 157,000 pounds of their fragrant Limburger and other varieties; and the Dutch 220,000 pounds.

With the exception of Canada, the dairy produce of our colonies is as yet insignificant, although there is no reason why in Australia, the Cape and Natal, and parts of British India, it should not in time become extensive.

Our exports of foreign cheese have fluctuated in the last fifteen years from 3,500 cwts. (the lowest) in 1848 to 9,436 cwts. (the highest) in 1853. The average of the last six or seven years gives an annual export of 5,970 cwts. The total shipments of cheese in 1855 comprised 27,666 cwts., of which 22,318 cwts. were British made. The chief shipments were 13,824 cwts. to Australia, 4,984 cwts. to Brazil, about 1,000 cwts. went to the East and West Indies and Turkey, and smaller quantities to South Africa, Mauritius, British North America, and the Continent. There is no reason why we should not make cheese enough for our own consumption, except perhaps that we trench somewhat largely on the milk production, especially for the supply of our large town populations.

We append a return of the imports of foreign cheese into the United Kingdom in the last sixteen years—

cwts.		cwts.	
1841....	270,219	1849....	390,147
1842....	129,748	1850....	347,803
1843....	179,389	1851....	338,659
1844....	213,850	1852....	289,458
1845....	267,824	1853....	396,404
1846....	341,682	1854....	388,714
1847....	354,802	1855....	385,136
1848....	441,635	1856....	407,076

STALLIONS FOR THE SEASON 1857.

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by.	Sire of	Standing at	Apply to	Price.
Abcrnethy .....	—	—	by Physician, dam by Orville.....	never appeared ..	—	12	Intrepid .....	Sandhutton, Thirsk .....	Mr. Wright .....	5 gs., h. b. 2 gs.
Accident .....	brown..	22	by Camel, out of Miss Breeze, by Phantom ..	never appeared ..	—	untried.	—	Newcastle, Stafford.....	Mr. Doyson .....	5 gs., h. b. 3 gs.
Acrobat .....	bay ..	6	by Ithuriel, out of Tour-de-Force, by Sir Hercules ..	started 19, won 12 ..	won Great Yorkshire Stakes ..	untried.	—	Denham, Uxbridge.....	Mr. Wheeler.....	10 gs.
Alarm.....	bay ..	15	by Venison, out of Southdown, by Defence ..	started 17, won 19 ..	won Ascot Cup .....	36	Francis .....	Newmarket .....	Messrs. Barrow ..	15 gs., h. b. 2½ gs.
Alcorn.....	brown..	8	by Thion, out of Adelgund, by Bay Middleton ..	started 15, won 2 ..	won £500 at Newmarket ..	untried.	—	Moulton, Newmarket ..	—	30 gs.
Amrose .....	black ..	8	by Touchstone, out of Amette, by Priam ..	started 19.....	—	untried.	—	Burgley, Stamford ..	Mr. H. Rose .....	10 gs.
Amundale .....	brown..	15	by Touchstone, out of Rebecca, by Lottery ..	started 15, won 3 ..	ran second for Derby ..	35	Apahy .....	Lane Paddock, Sheffield ..	F. Croft .....	15 gs., (25 mares).
Aschly .....	bay ..	18	by Camel, out of Garcia, by Octavian ..	started 8, won 1 ..	won £1000 at Newmarket ..	7	Flacour .....	Swallowcliffe, Banbury ..	Mr. Galliver .....	10 gs., dams of w. 5.
Astley .....	bay ..	6	by Orlando, out of Plearny, by Octavius ..	started 8, won 1 ..	won £250 at York.....	untried.	—	Newbold-Pacey, Warwick ..	J. Clarke .....	£1 gs.
Auchinleck .....	bay ..	7	by Assadul, out of Marianne, by Caliph ..	started 23, won 4 ..	won £35 at Edinburgh ..	untried.	—	Uphall, Edinburgh ..	Mr. Casson .....	5 gs.
Aneur .....	chestnut	8	by Birdcatcher, out of Nickname, by Ismael ..	started 4, won 3 ..	won Champagne Stakes ..	untried.	—	Beverly .....	D. Price .....	10 gs.
Autocrat .....	bay ..	6	by Bay Middleton, out of Empress, by Emilia ..	started 5, won 5 ..	won the New Stakes .....	untried.	—	Lymington .....	H. Thorn .....	10 gs., h. b. 5 sovs.
Backbiter .....	brown..	12	by Gladiator or Don John, out of Scandal, by Seth ..	started 24, won 5 ..	won Goodwood Stakes ..	untried.	—	Eaton, Chester .....	—	10 sovs., h. b. 5 sovs.
Backrobie .....	bay ..	7	by Anandale, out of Queen Mary, by Gladiator ..	started 10, w on ..	won Doncaster Stakes ..	untried.	—	Turf-Tavern, Doncaster ..	—	8 gs., &c.
Baron .....	bay ..	13	by Voltair, out of Martha Lynn, by Mulatto ..	started 3 ..	—	5	Fandango .....	Bishley, Hampton Court ..	—	20 gs.
Bar Middleton .....	bay ..	24	by Sultin, out of Colweb, by Phantom ..	started 7, won 7 ..	won the Derby .....	117	Flying Dutchman ..	Dancebury .....	Mess. Wetherley ..	50 gs., (20 mares)
Bessus.....	brown..	6	by Bay Middleton, out of Brown Bess, by Camel ..	started 1, won 1 ..	won Two-year-old Stakes ..	untried.	—	Theobald's Park, Ed- field ..	M. R. Gray .....	10 gs.
Birdcatcher, Irish .....	chestnut	24	by Sir Hercules, out of Guiccioli, by Bob Booby ..	started 18, won 6 ..	won the Madrids .....	164	The Baron .....	Cawston, Rugby .....	Mr. Henning .....	20 gs., (40 mares).
Black Doctor .....	black ..	9	by The Doctor, out of Betsy Bird, by Voltare ..	started 48, won 7 ..	won Manchester Cup ..	untried.	—	Newmarket .....	Messrs. Barrow ..	10 gs., h. b. 5 gs.
Black Prince .....	black ..	15	by Touchstone, out of Queen of Trumps, by Velocipede ..	started 1 ..	—	1	Liberty .....	Water Tower, Rugby ..	Mr. Walker.....	5 gs., h. b. 2 gs.
Boiardo .....	bay ..	6	by Orlando, out of Miss Rowe, by Catton ..	started 12, won 4 ..	won the Gratawicke Stakes ..	untried.	—	Rordon, Diss .....	T. Sturgeon .....	10 gs.
Brocket .....	brown..	17	by Liverpool, out of Nancy, by Osmond ..	started 8, won 7 ..	won Champagne Stakes ..	8	Bourgeois .....	Crosby, Carlisle .....	J. Mohatt .....	5 gs., h. b. 2 gs.
Brocket .....	bay ..	7	by Melbourne, out of Miss Slick, by Mules ..	started 7, won 3 ..	won Royal Hunt Cup ..	untried.	—	Denham, Uxbridge.....	Mr. Wheeler.....	10 gs.
Caleb .....	bay ..	14	a pure Arab .....	never appeared ..	—	—	—	Brixton Hill, Wolver- hampton ..	Mr. G. Dalls .....	3 gs., h. b. 2 gs.
California (Bro to Riddlesworth.) ..	chestnut	14	by Emilius, out of Flagree, by Southsayer ..	never appeared ..	—	8	May Day .....	Bushbury, Wolver- hampton ..	J. Daly .....	5 gs., h. b. 3 gs.
Cardinal, Cornish ..	chestnut	7	by Iago, dam by Hampton ..	started 14, won 4 ..	won Chester Walter Cup ..	untried.	—	Boston .....	Mr. P. Sneath.....	2½ gs.
Careless .....	bay ..	6	by Touchstone, out of Crucifix, by Priam ..	never appeared ..	—	untried.	—	Macchesfield .....	Mr. Harvey.....	5 gs., h. b. 2 gs.
Cariboo .....	brown..	10	by Rochester, dam by Velocipede ..	started ..	—	untried.	—	Taunton .....	Mr. Hopkins.....	5 gs., h. b. 2 gs.
Casby .....	brown..	10	by Venison, out of Jamaica, by Liverpool ..	started 30, won 17 ..	won Ascot Vase .....	untried.	—	Beverly .....	T. Griegs .....	7 gs., h. b. 2½ gs.
Chabron .....	bay ..	13	by Slane, out of Colweb, by Phantom ..	started 40, won 4 ..	won £90 at Newmarket ..	6	Walshbourne .....	Churchover, Rugby ..	Mr. Peat .....	5 gs., h. b. 2½ gs.
Chancellor .....	grey ..	14	by Camel, out of Fanny, by Whisker ..	started 40, won 4 ..	won £90 at Newmarket ..	6	Vengeance .....	Croft, Darlington .....	Mr. Peat .....	5 gs., h. b. 3 gs.
Chasseur .....	grey ..	14	by Birdcatcher, out of Winn, by Drone ..	started 37, won 21 ..	won Doncaster Cup .....	24	—	Merstham, Beigate.....	T. Winteringham ..	20 gs.
D'Afrique .....	bay ..	9	a pure Arab .....	—	—	untried.	—	—	Mr. Riss .....	5 gs.
Confessor .....	bay ..	13	by Cowi, out of Forest Fly, by Mosquito ..	started 8, won 2 ..	won Great Yorkshire Handicap ..	untried.	—	Theobald's Farm, Enfield ..	Mr. R. Gray .....	10 gs.
Connaught Ran- ger .....	chestnut	13	by Harkaway, out of Guiccioli, by Bob Booby ..	started 32, won 4 ..	won the Corinthians.....	2	Confederate .....	Rawcliffe, York .....	T. Bateson.....	5 gs., h. b. 2 gs.
Consultation .....	chestnut	8	by The Doctor, out of Confusionée, by Emilius ..	never appeared ..	—	—	—	Hessle, Hull .....	Mr. L. Hall .....	5 gs., h. b. 2 gs.
Cotherstone .....	bay ..	17	by Touchstone, out of Emma, by Whisker ..	started 11, won 7 ..	won the Derby .....	53	Punicestone .....	Althorp, Northampton ..	Mr. Elliott.....	12 gs., (20 mares)
Cow .....	bay ..	15	by Bay Middleton, out of Crucifix, by Priam ..	started 8, won 3 ..	won Buckenham S. ....	25	Dervish .....	Lebourne, Madstone ..	Mr. Tweed .....	15 gs., h. b. 5 gs.
Crozier .....	bay ..	13	by Lanercost, out of Crucifix, by Priam ..	started 18, won 3 ..	won £650 at Ascot ..	10	Simon Pure .....	Northampton .....	Mr. Dickens .....	7 gs., h. b. 3 gs.
Cruiser .....	bay ..	5	by Venison, dam by Little Red Rover ..	started 1 ..	second for Criterion ..	untried.	—	Rawcliffe, York .....	T. Bateson.....	5 gs.
Cure, The .....	brown..	16	by Physician, out of Morse, by Mulatto ..	started 26, won 16 ..	won the Claret .....	18	M. D. .....	Rawcliffe, York .....	Mr. Ashton .....	15 gs.
Damask .....	black ..	10	by Touchstone, out of Moss Rose, by Blacklock ..	started 3, won 1 ..	received a match forfeit ..	untried.	—	Omby, Breg .....	Mr. Groves .....	6 sovs., h. b. 3 sovs

Daniel O'Rourke	cheshut	8	by Birdcatcher, out of Forget-me-not, by Hel-	started 10, won 2	won £130 at Goodwood	untried.	Sladmore, Malton	Sir T. Sykes	10 gs.
Dear-me!	bay	7	by Melbourne, out of Ennai, by Bay Middleton	started 45, won 7	won £130 at Goodwood	untried.	Harwood, Bolton	Mr. Redhead	5 gs., h. b. 2½ gs.
De Clare	bay	5	by Touchstone, out of Miss Bows, by Catton	started 4, won 3	won Newmarket Stakes	untried.	Cross Keys, York	Mr. Pearson	7 gs., h. b. 2½ gs.
Defiance	bay	7	by Old England, out of Vexation, by Touchstone	started 54, won 17	won Northampton Stakes	untried.	Bromyard	Mr. Devereux	2 gs.
Doctor O'Toole	cheshut	20	by Birdcatcher, out of Dahlia, by New Fashion	started 22, won 7	won £160 at Curragh	untried.	The Curragh	Mr. D. Connor	3 sovs.
Drayton	brown.	6	by Muley, out of Prima Donna, by Southey	never appeared	9		The George, Melton	Mr. Watson	7 sovs., h. b. 3 sovs.
Eagle	cheshut	16	by Birdcatcher, out of Emily, by Pantabon	started 4, won 1	won Two-year-old Cragh St.	1	Enfield	Mr. Gray	8 gs., h. b. & d. w. 4 s.
Elcot	bay	11	by Venison, dan (half-bred) by Defence	started 7, won 3	won Woodcock Stakes	untried.	Marlborough	Mr. Dixon	5 gs., h. b. 2½ gs.
Escadarias	cheshut	8	by Gladiator, dan by Velocede	started 8, won 2	won Somersetshire S.	untried.	Hudhill, Sheffield	Messrs. Saville	8 sovs., h. b. 3 sovs.
Ethelbert	cheshut	7	by Faugh-a-Ballagh, out of Espoir, by Liverpool	started 19, won 3	won City and Suburban Handicap	untried.	Swalcliffe, Banbury	Mr. Gulliver	5 gs.
Fallow Buck	bay	12	by Venison, out of Plenary, by Emilius	never appeared	3		Liss, Hants	Mr. W. Ayling	5 gs.
Fernhill	brown.	11	by Ascot, out of Arethusa, by Elis	started 34, won 11	won Metrop. Handicap	untried.	Ovmyly, Brigg	Mr. Ashton	7 gs.
Filbert	bay	7	by Nutwith, out of Colin, by Touchstone	started 36, won 17	won the Claret	untried.	BallingCourt, Rochester	Mr. Park	10 sovs.
Flatcatcher	bay	12	by Touchstone, out of Decoy, by Filho-da-Puta	started 26, won 10	won 2,000 Gs. Stakes	27	Birch, Oswaldkirk	—	10 sovs., h. b. 5 sovs.
Fly-by-Night	brown.	4	by The Flying Dutchman, out of The Plapper	started 6, won 4	won Ascot Derby	untried.	Bonehill, Tamworth	Mr. Robinson	10 gs.
Flying Buck	bay	11	by Venison, out of Varr, by Lottery	never appeared	15		Plompton, Harrigate	Mr. Groves	10 gs.
Flying Dutchman	brown	7	by Bay Middleton, out of Barbelle, by Sandbeck	started 16, won 15	won the Derby	untried.	Zawcliffe, York	T. Bateson	50 gs. (30 mares, full)
Forsal	brown.	19	by Sheet Anchor, out of Valencia, by Cervantes	never appeared	20		Datchet, Windsor	Mr. House	5 gs., h. b. 2 s.
Galoor	bay	17	by Muley Molech, out of Darfoletta, by Amadis	started 19, won 5	won Manchester Cup	10	Bridlington, &c.	Mr. Smith	10 gs.
Garchoy	brown.	15	by Tomboy, out of Lady Moore Carew, by Trami	never appeared	25		F. Massie	10 gs., h. b. 3 s.	
Goorkah	brown.	7	by Ammandale, out of Fair Jaye by David	started 24, won 5	won Liverpool Cup	untried.	Catrick	Mr. P. Babus	5 gs., h. b. 3 s.
Grecian	cheshut	9	by Epirus, out of Jenny Jumps, by Rocco	started 4, won 2	won July Stakes	untried.	Thehall's Farm, Stock-	Mr. S. Matthews	10 sovs.
Grosvenor	brown.	9	by Touchstone, out of Miss Beverley, by Stockton	started 3, won 1	won Plymouth Vase	untried.	Aldford, Chester	—	5 sovs.
Haco	brown.	7	by Old England, out of Dauntless, by Defence	started 14, won 1	won Cesarewitch	untried.	Stourton, Homecastle	D. Roden	5 gs., h. b. 2½ gs.
Harkaway	cheshut	23	by Economist, dan by Macintosh	started 38, won 7	won Goodwood Cup (2)	82	Ladykirk, Berwick	C. Bitton	10 sovs., h. b. 7 sovs.
Hazelnut	brown.	7	by Nutwith, out of Nacrevanna, by Sultan	started 26, won 7	won £150 at Manchester	untried.	Ashton, Lancaster	W. Robinson	5 gs.
Hermut, Tue	brown.	6	by Bay Middleton, out of Jenny Lind, by	started 10, won 5	won 2,000 Gs. Stakes	untried.	Hambleton, Thirsk	Mr. Stebbing	5 sovs., h. b. 3 sovs.
Hero, The	cheshut	14	by Chesterfield, out of Grace Darling, by De-	started 37, won 29	won Emperor's Plate	4	Danebury, Stockbridge	—	10 gs.
Hobbie Noble	bay	8	by Pantalon, out of Phryne, by Touchstone	started 14, won 5	won New Stakes	untried.	Plompton, Harrigate	Mr. Groves	10 gs., h. b. 5 gs.
Hospodar	cheshut	6	by Herpan Platoff, out of Inidilly, by Voltare	started 36, won 14	won £240 at York	untried.	Gillingwood, Richmond	Mr. Simpson	5 gs.
Hungerford	cheshut	9	by J. hn o'Gaunt, out of Miss Ety, by The	started 67, won 17	won York Handicap (2)	untried.	Turf Tavern, Doncaste	Mr. W. King	5 gs., h. £2 10s.
Idle Boy	cheshut	12	by Harkaway, out of Idle, by Sir Hercules	started 9, won 13	won Chester Cup	3	Ashton, Lancaster	W. Robinson	25 gs. (30 mares)
Intrrepid	bay	16	half-bred by Accident, out of Judy Callaghan	started 32, won 13	won £400	untried.	Whebeck, Sandbach	—	8 sovs., h. b. 3 sovs.
Ivan	brown.	16	by Van Tromp, out of Siberia, by Bratadorff	started 15, won 5	won Great York Stakes	2	KIRBY, Tadcaster	Mr. Scott	5 gs.
Joe Lovell	bay	19	by Velocede, out of Cyrius, by Partizan	started 6, won 3	won Newmarket S.	90	Alvinston, Wils	Mr. W. Day	12 gs. (30 mares)
John o' Gaunt	cheshut	19	by Taurus, out of Mona, by Partizan	started 38, won 29	won second for Derby	untried.	Montmore, Bucks	F. Bateson	5 gs., h. b. 3 gs.
King Ton	bay	8	by Harkaway, out of Peleahontas, by Glencoe	started 6, won 3	ran second for Derby	untried.	Wentmore, Bucks	Mr. Markham	25 gs. (25 mares)
King of Oude	bay	9	by Sparlshoes, out of Mustard, by Equite	started 17, won 15	won Royal Plate	untried.	Hackton, Northampton	—	10 sovs., d. w. 5, h. b. 3
King of Truaps	cheshut	8	by Velocede, out of Mrs. Gill, by Viator	started 47, won 2	won second for Derby	untried.	Turf Tavern, Doncaste	—	6 gs.
Kinston	brown.	5	by Yeats, out of Foinmally, by Birdcatcher	started 43, won 4	won Goodwood Cup	untried.	Hurstbourne, Hants	R. Milhou	22 gs. (35 mares)
Knight of Gwynne	brown.	10	by Gilbert Gurnel, out of Queen Anne, by Stane	started 12, won 17	won Norton St. Leger	3	Middle Park, Eitham	Mr. Benkron	15 gs., h. b. 3 gs.
Knut of St. George	bay	10	by Birdcatcher, dan by Helmut Platoff	started 13, won 5	won the St. Leger	untried.	Plompton, Harrigate	Mr. H. Rose	15 gs., h. b. 3 gs.
Labrador	cheshut	8	by The Lieut, out of Miss Kitty Cocker, by	started 17, won 4	won Cheshire Stakes	untried.	Bushbury, Wolver-	Mr. Daly	10 gs., h. b. £3 4s. 0d
Launcelot	brown.	20	by Camel, out of Emma, by Whisker	started 10, won 6	won St. Leger	24	LancPoldicks, Sheffield	F. Crofts	10 gs.
Leopold	cheshut	8	by Phlegon, out of Marinella, by Southsayer	started 7, won 2	won Ascot Vase	untried.	Menorah, Leighton	Mr. Markham	7 gs., h. b. 3 gs.
Libel, The	brown.	15	by Pantalon, out of Pasquinade, by Camel	started 7, won 3	won Chester St. Leger	14	Buzard	Sir T. Sykes	10 gs., h. b. 3 gs.
Little Known	bay	21	by Muley, out of Larcera, by Zofia	started 22, won 1	won £100 at York	untried.	Wentworth, Rothbarth	Mr. House	£1 10s.
Longbow	bay	10	by Inidilly, out of Miss Bove, by Catton	started 21, won 13	won Stewart's Cup	untried.	Knowlesy, Presscott	F. Forshaw	10 gs. (40 mares)

STALLIONS FOR THE SEASON 1857—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out of.	Site of	Standing at	Apply to	Price.
Lord Falcon-bergh	bay	7	by Irish Birdcatcher, out of Alice Hawthorne, by Muley Moloch	started 19, won 1	won a Royal Plate	untried.	—	Rose-street, Edinburgh	Mr. M'Adam	5 2 gs., h. b. 2 gs., &c.
Lord of the Isles	bay	5	by Touchstone, out of Fair Helen, by Pantaloon	started 10, won 4	won 2,000 gs. Stakes	untried.	—	Croft, Darlington	P. Winterringham	12 gs.
Magpie	brown	11	by Lanercost, out of Moonbeam, by Toubay	started 6, won 1	received £15 ft.	3	Lambourne	D-ford, Pershore	W. Hadley	15 gs. (30 mares)
Magnus	bay	8	by Touchstone, out of Latitude, by Langar	started 4, won 1	—	untried.	—	Swathcliffe, Banbury	Mr. Galtiver	10 gs., dams of w. 7.
Magnet, The	bay	15	by Carr, out of The Queen of the Vale, by Turrel	started 15, won 11	won Granby Handicap	1	Magnifier	Audlem, Nantwich	Mr. Lisle	7 gs., h. b. 2 1/2 gs.
Mandricardo	chestnut	6	by Orlando, out of Duverney, by Emilius	started 8, won 1	won £75 at Kelsco	untried.	—	Knockhill, N.R.	R. Menzies	5 gs., h. b. £2 10s.
Manley Hill	brown	6	by Melbourne, out of Moberg, by Touchstone	started 4, won 1	won £220 at Newcastle	untried.	—	Skerne, Driffield	Mr. Stockdale	5 gs., h. b. 2 gs.
Mars	brown	29	by Orlando, out of Miss Gilles, by Lady Py	started 10, won 2	and for the St. Leger	—	—	Sterne, Yorkshire	Mr. Stockdale	7 gs., h. b. 2 gs.
Marsyas	chestnut	6	by Orlando, out of Maliban, by Whisker	started 17, won 3	won July Stakes	untried.	—	Little Park, Etilham	Mr. Blenkhon	6 gs., h. b. 3 gs.
Mathematician	bay	11	by Emilius, out of Maria, by Whisker	started 7, won 3	won Ebor Handicap	2	Monge	Lowfold, Pctworth	—	6 gs., h. b. 3 gs.
Mathey Free	brown	5	by Emilius, out of Birdcatcher, out of Anate, by Wanderer	started 23, won 12	won Cleveland Cup	6	May Blossom	East Aytou, Scarborough	—	5 gs., h. b. 2 gs.
Midas	chestnut	9	by Britain, out of Merope, by Voltare	started 25, won 9	won Newmarket St. Leger	untried.	—	Rughey, Stamford	Mr. H. Rose	5 gs.
Mortimer	bay	6	by Stone, out of Glencoe	never appeared	—	untried.	—	Lincoln	Mr. Bland	—
Morphy	brown	16	by Muley Moloch, out of Glencoe	started 34, won 2	won Northampton St.	untried.	—	Beverley, &c.	Mr. Ellis	5 gs., h. b. 2 gs.
Muscovite	bay	8	by Mexican Phoenix, out of Cervantes	started 19, won 2	won Cesarwitch	untried.	—	Bas-ton, Lancaster	Mr. Harris	10 gs. (30 mares)
Nabob	black	8	by The Xob, out of Hester, by Camel	started 35, won 6	won Chesterfield Cup	untried.	—	Findon, Wortling	Mr. Mitchell	15 gs.
Nagier (Yg)	bay	7	by Napier, out of Andrew	has been hunted.	—	untried.	—	Bonehill, Tamworth	Mr. Robinson	2 sovs.
Nasham	bay	9	by Mexican Phoenix, out of Wasp, by Muley Moloch	started 16, won 3	won Northumberland P.	1	Heroine	Middle Park, Etilham	Mr. Blenkhon	8 gs., h. b. 4 gs.
Newcourt	bay	14	by Sir Hercules, out of Sybil, by Spocire	started 10, won 8	won Hereford Stakes	untried.	—	Althorp, Northampton	Mr. Elliott	10 gs. (30 mares)
Newminster	bay	9	by Touchstone, out of Beeving, by Dr. Syntax	started 10, won 2	won St. Leger	untried.	—	Rawcliffe, York	F. Bateson	15 gs.
Nurgh	bay	17	by Toubay, out of Cornus	started 7, won 3	won St. Leger	29	Cobnut	Burgley, Stamford	Mr. H. Rose	25 gs.
Ober P. Ash	bay	6	by Arab—Seglave Djeterance	never appeared	—	untried.	—	Albury, Northampton	Mr. Elliott	5 gs.
Orestes	bay	7	by Orlando, out of Bay Middleton	started 33, won 9	won Woodcote Stakes	untried.	—	Keatsley-Thorp, Brigg	Mr. Hobson	10 gs.
Oulton	bay	5	by Melbourne, out of Alice Hawthorn, by Muley Moloch	started 11, won 7	won Queen's Vase	untried.	—	Cawston, Rugby	Mr. Hemming	10 gs., h. b. 5 gs.
Papageno	chestnut	6	by Birdcatcher, out of Sister to Wano, by Simoom	started 2, —	—	untried.	—	Bridge, Canterbury	Mr. Sheppard	6 gs., h. b. 3 gs.
Pelon	brown	7	by Ion, out of Ma Mie, by Jerry	started 16, won 8	won Eglington Stakes	untried.	—	Chobwell	Miss Weatherby	10 gs.
Phenomenon	bay	12	by Old Phenomenon, out of a Lincoln mare	—	—	untried.	—	Chobwell, Tames	Mr. Watson	10 gs.
Phlegon	bay	17	by Britain, out of Lucretia, by Reveller	started 9, won 2	won G. Duke Michael S.	10	Leopold	Burgley, Stamford	Mr. H. Rose	10 gs.
Planet	bay	13	by Bay Middleton, out of Penary, by Emilius	started 9, won 4	won Molecomb Stakes	8	Ceres	Roxton, Diss	T. Surzeon	10 gs.
Pompey	brown	17	by Emilius, out of Variation, by Husband	started 36, won 10	won Gt. York Hand. (2)	14	Nancy	Barton Pleasa, Hull	Mr. Baxter	10 gs.
Pompey (late bay Chene)	late bay	10	by Pompey, out of Interlude, by Physician	started 36, won 1	won £350 at Derby	untried.	—	Ardee, Ireland	—	4 sovs., h. b. 2 sovs.
Poynton	bay	14	by Touchstone, out of Lady Stafford, by Comms	started 6, won 2	won Great York S.	9	Lady Vernon	Bay Horse, York	Mr. S. Reed	5 sovs., h. b. 2 sovs.
Portinger	bay	13	by Plenipotentiary, out of Enterprise, by Defoez	started 22, won 5	won £50 at Newmarket	untried.	—	Broughton, Stokesley	Mr. Parry	5 gs., h. b. 2 gs.
Pyrrhus the First	chestnut	14	by Ehirus, out of Fortress, by Defence	started 13, won 10	won the Derby	29	Virago	Wilton, Pockocks	Mr. Phillips	30 gs. (40 mares)
Rakapan	chestnut	7	by The Baron, out of Pocalontas, by Glencoe	started 71, won 42	won 21 Royal Plates	untried.	—	Tebbill, Cusdie, Earm	W. Hornshaw	23 gs. (40 mares)
Rattle	chestnut	7	by The Fallow Buck, out of The Hauble, by Camel	started 7, —	—	untried.	—	Auder's Ash, Lass	Mr. Ayling	8 gs., dams of winners, 3 sovs.
Red Hart	bay	12	by Venison, out of The Colonel's Daughter, by Recovery, out of Tagioni, by Whisker	started 16, won 8	won Duke Michael S.	5	Zaidee	The Carrugh	—	6 gs., h. b. 3 gs.
Retriever	chestnut	21	by Recovery, out of Tagioni, by Whisker	started 53, won 24	won Goodwood Stakes	11	Remunerator	Water Tower, Rugby	Mr. Walker	5 gs., h. b. 2 gs.
Rifleman	bay	5	by Touchstone, out of Camp Follower, by The Colonel	started 16, won 8	won Great York S.	untried.	—	Sticmore, Malton	Sir T. Sykes	15 gs.
Robert de Gorham	brown	18	by Sir Hercules, out of Duverney, by Emilius	started 20, won 7	and for the Derby	23	Alycane	Newmarket	Messrs. Barrow	20 gs.
Robert Hood	bay	8	by Sir Isaac, out of Mystery, by Pantaloon	started 10, won 2	won a Royal Plate	untried.	—	Whittington, Oswestry	J. Cartin	5 gs., h. b. £2 10s.
Robin Hood	bay	6	by John of Gaunt, out of Cara, by Belshazzar	started 10, won 2	won £10 at Darham	untried.	—	Knuson, Wellington	—	2 gs.
Rochester	black	11	by Chatham, out of Margarine, by Little John	started 17, won 5	won £273 at Newmarket	4	Persia	Fountain, Bedford	Mr. Ward	6 gs., h. b. £2 5s.



## THE RECENT PROCEEDINGS OF THE ROYAL AGRICULTURAL SOCIETY.

It cannot be considered but as an evidence of the increasing importance and influence of such an institution, that the proceedings of the Royal Agricultural Society are now watched with much interest and critical attention. The Council work more than ever with the eyes of England upon them. There was a time when the community of farmers just attended the July show, received their Journals, and paid their subscriptions, without caring to know much about what was done, or who did it. This, however, has gradually changed—and, we may say, for the better. The general body of members are beginning to identify themselves more with the Society they support. Whether consulted or not, there is not an act agreed upon, nor a resolution arrived at, but that they are pretty sure to talk it over. If, moreover, you will only listen a little, they are brimful of suggestions and alterations; have propositions that must benefit the Society, if only fairly entertained; and, often enough, ample experience and argument to maintain what they advance.

Latterly, there has been no lack of something to talk over. The Agenda Book of the last two Monthly Council Meetings must have provided plenty of business to get through. First, and most essential of all, there was that question of Finance which limits so many a development, and so often stops the mouth of a progressionist. At the first glance it is absolutely startling to see how much the country meeting costs the Society. When we remember the bonus invariably raised from the locality selected, and the additions to the prize lists from the same source—when we couple these with the money taken at the doors, the sale of tickets for the dinner; of catalogues in the yard and other incomings—one could scarcely suppose that a national agricultural show could be such a very bad speculation, after all. But it is. Chelmsford last year contributed fourteen hundred pounds; the admissions reached three thousand; and the catalogues and dinner tickets made close upon seven hundred. In all, the receipts amounted to six thousand five hundred, and the Society lost two thousand pounds by the week! To be sure it offers sixteen hundred in premiums; and the expenses of laying out and fitting up the yards, with those of the judges exceed three thousand. The catalogues about clear themselves, as within a hundred or so does the very good cold dinner Mr. Holt puts upon the table. And yet this dinner shows a deficit of something like seven hundred pounds! It is nearly always well attended. On the last two or three occasions there have been very few vacant places; and still, nearly half of this retreating two thousand is debited to the dinner.

How can it be? asks somebody who has not studied the question. The oratory is gratis; there are no professional singers to answer for, and the toastmaster and trumpeting altogether do not come to a ten-pound

note. But then the pavilion—it is well called the "Pavilion" dinner—annually costs the Society something like six hundred pounds; and the contractor is often supposed to lose money by the job. Then do away with the dinner, say the economists; or, Do away with the pavilion, say others, who know there is no getting on in this country without a dinner. And the Council are going to do away with the Pavilion. Something less expensive will be tried this year at Salisbury, and we can only hope with every success. In any case, it will never do to abandon the dinner. It has always been one of the attractive features of the week; as, indeed, it always must be. Putting aside the question of cost, we must say it has generally been very well done; in fact, we remember no other such a ceremony where so large a company has been so admirably accommodated. Something, we believe, might be learnt in the way of economy from the West of England meetings, where, beyond the original outlay on Mr. Gray's material, the cost of erection is little or nothing.

So far so good. Then we are to have this year a series of lectures on the first Wednesday in every month, beginning with Professor Way in April. With the hope of securing a better attendance, these are now fixed for the evening instead of the morning, as heretofore. We could have almost wished they had also been made one day earlier in the week. On the first Monday in the month there is the Discussion Meeting of the Central Farmers' Club; on the Tuesday morning, meetings of one or two other agricultural bodies; and many a man that we could name would stop over Tuesday who cannot afford another day. On the other hand, Wednesday evening is "no House" in the Commons, so that members will have the opportunity of attending in Hanover-square. Unfortunately, so far, we have not a great many farmers in the House, though there is no knowing what this election may do for us. At any rate, let those who have not the opportunity of hearing these lectures have the chance of reading them as soon as possible. It is this dissemination of intelligence that gives its chief value. What, for instance, would be the effect of the discussions at the Farmers' Club, if they were not reported immediately in our own and other agricultural papers, or circulated amongst the members by means of the Journal? Why, for one man, one ruralist recollect, who attends a meeting of this kind, a thousand at least read of it. And here is Professor Way going to lecture next week upon guano, and it will be, according to precedent at least, three or four months, about the middle of July say, before the thousands of members will know a word of what Professor Way *has* been saying about guano. The Professor, we repeat, lectures in the evening of the first Wednesday in April, at eight o'clock. On the morning of the same day the members of the Council meet, and

at that meeting let some member harden his heart, and propose manfully in so many words that "reporters be admitted."

Let us not be misunderstood. This is by no means a matter personal to ourselves. Had it been so, we might have been less prone to speak of it. The question is rather one with the agricultural public, with the general body of the members, that is, who wish to know what is going on, and to turn the Society to its best uses. It will not do three months after date to pay over Professor Way or Professor Simonds to those to whom he is due now. We care not how the amount is transmitted, so there be value received some way or other. If it would

be making the Professors too well known to give them in full in the *Mark Lane Express*, or any other of our contemporaries, let special reports of these several lectures be sent at once from the Society to the members of the Society—Another, and not the least promising plan for inducing people to join.

Both these matters we have referred to are steps in the right direction, and it can only be regretted should they lose any of their effect in the completion of the arrangements connected with them. The money saved at Salisbury may be better applied; and the ready dissemination of the Society's knowledge cannot but make it the better appreciated.

## THE PREMIUM SUBJECTS OF THE SOCIETY OF ARTS.

If the two hundred and sixteen "Subjects for Premiums" issued by the Council of the Society of Arts meet with the response they are entitled to command from members and the general public, the 31st of this month (the final day for admitting essays and articles for competition) will put the Society in possession of a mass of information surpassing in value, variety, and usefulness any ever before collected. We are glad that the list of *desiderata*, while including essays and accounts of new processes in the arts or in methods of manufacture, drawings and models illustrating any new mechanical arrangement by which these may be simplified or labour saved, and descriptions of any novel application of raw materials to useful purposes, or specimens of such materials not previously known, embraces several strictly agricultural subjects, with various others, manufacturing, engineering, chemical, or commercial, having an important bearing upon the pursuits of husbandry. Thus, among the 96 subjects under the head "Raw Materials," one is "For an account of the best methods of growing and preparing flax, with a comparison of natural and artificial modes of steeping." Another is, "For an account of the various grain and pulse crops grown in India, classifying them under their several local and botanical names, and specifying their culture, yield, uses, and prices." And then we have also, "For an account of the methods at present employed for the extraction of oil from seeds, and the useful application of the cake, or marc, as food, manure, &c.;" "For the production of ammonia or nitric acid from their elements, by methods which would admit of practical application;" "For the production of charcoal from wood, capable of being used as an economical and efficient substitute for animal charcoal in the manufacturing processes where the latter is at present used;" "For the best collection of tanning substances, distinguishing those at present used from those generally unknown to commerce;" "For an account of the principal dyes and dye stuffs at present employed in the woollen and silk trades [another subject referring to the cotton trade], their sources of supply and modes of application;" "For an account of the processes at present employed for the extraction of dyes and co-

louring matters from animal, vegetable, and mineral substances;" "For an account of road material of different kinds, and the absolute [and relative value of each." Here there is ample scope for any agricultural or rural improver to enlighten us upon everything relating to flax, oil-cake, nitrogen manure, woad, weld, madder, bark, charcoal-burning, road-making, &c.

Among the 70 subjects under the head "Machinery," one is "For an Essay on the application of Steam Power to the cultivation of the soil"; another, "For an essay on the principles which should regulate the construction of reaping-machines, with a review of those which have been practically tested"; another, "For an account of the machinery employed in reaping, drawing, thrashing, hulling or shelling, grinding, crushing, cutting, and pulping farm produce;" another "For the best method of drying corn, both before and after being thrashed." And, still further, we have "For an account of the best machinery employed in drying, cleaning, grinding and dressing wheat into flour;" "For an account of the best machinery for preparing, grinding, and dressing barley and oats into their respective manufactured constituents, pearl barley, groats, &c.;" "For an account of improvements in the manufacture of sugar from beet-root, in Great Britain and Ireland, and of the results obtained;" "For an account of the uses of wire-ropes, with a review of its relative merits when compared with hemp-ropes and chains, particularly for drawing in deep shafts;" "For an account of the machinery and process at present employed on the Continent for earth-boring." From all these papers we anticipate much valuable service to the farmer, alike in furnishing new knowledge upon many processes for treating his produce and enhancing its value, assisting him in the important matter of farm-machinery, and advancing the great question of cultivation by steam.

Among the 51 subjects under the heads "Manufactures" and "Miscellaneous," we find—"For an essay on the arterial drainage of land, considered with reference to the geological strata of the districts to be drained, with suggestions for such improvement in the main and subordinate outfalls of the country as are rendered desirable by the more rapid accumulation of

surface water, caused by the increase of under-draining;" "For the best method of economically deodorising sewage and other waters, and of precipitating or otherwise extracting the matters held by them in solution or suspension;" "For the best method of separating (and preserving) ammonia and its compounds from sewage waters and refuse matters, for agricultural purposes;" "For the best method of converting precipitated or extracted sewage matter into a dry or available state, for agricultural purposes;" "For the best method of enriching the solid matter obtained from sewage waters, either by mixing the same with other salts or manures in which the solid sewage matter is deficient, so as to adapt it to various agricultural crops; or, by facilitating its decomposition, to render any latent fertilizing ingredient it may contain more readily fit for the food of plants;" "For an essay on the management and maintenance of public roads, with special reference to their altered position since the introduction of railways;" "For a cheap quality of glass, applicable for drains, water-pipes, sinks, shelves for larders, dairies, etc., in which coarseness and want of transparency are not regarded." Here the subjects relating to sewage manure are of the very greatest importance to the agriculturist and to the entire community, and the solution of the difficulties involved in the terms stated would be a triumph of practical chemistry and an unspeakable gain to the world.

Out of 216 subjects, comprising art, manufactures, metallurgy and mining, mechanics and engineering, chemistry as applied to the arts, sanitary science, industrial instruction, colonies and commerce, there are ten directly agricultural, and fifteen more immediately connected with cultivation and rural economy. There is yet time for any of our readers to send in any information it may be, in their power to afford; and we advise them to apply at once to the secretary, at John-

street, Adelphi, for the conditions on which communications are receivable.

It is possible that a long time may elapse before valuable or novel suggestions in a prize essay become generally appreciated and put in practice, for we well know, from the example of the Royal Agricultural Society's experience, that published information and theoretical proposals are often very far a-head of actual realization. Take arterial drainage, for instance, and we see that, in spite of prize essays, detailed reports, engineers' recommendations, long and incessant complaints of loss and damage, and frequent appeals for redress and for an improved system, floods are still prevalent as ever, river estuaries remain choked, water-mills dam back the drainage from myriads of deep-buried pipes, quarrels and litigation attend rights of water-way, and no great movement is yet on foot for the redemption of our wet valleys and their conversion into good corn-land. But undoubtedly the publication of the best knowledge and the newest ideas respecting any great subject in art, manufacture, husbandry, &c., tends to accomplish the desired result by enlightening and strengthening those individual minds that may be engaged upon that particular subject, and so through their agency gradually reaching and affecting all who should be concerned in it. Some subjects in the above list are not of this advanced character, but speak at once to the attention and interest of us all; and the production and public enunciation of any private and local knowledge, experience, or suggestion, will prove of incalculable service to every practitioner who is seeking the means of progress and improvement.

In our next we will say a few words upon some of the topics named in the Society's schedule, hoping that our reminder will not be too late for some of our agricultural penmen who may not have had their attention drawn to this means of promoting and diffusing their views or inventions.

## REVIEWS.

THE POST AND THE PADDOCK. BY THE DRUID. (Hunting Edition.—London, 1857.) Piper, Stephenson, and Spence, Paternoster-row.

This is the third edition of one of the most interesting sporting publications we have ever taken in hand. The two first editions contained but twelve chapters; to this are added three others; viz., the "Breeding of Hunters," "Auld Lang Syne," and "Dick Christian's Lecture." Heroes and lovers speak poetically, but The Druid having eyes to see what *has* passed and *is* passing around him, gives his recollections in an artistic and highly-finished manner. To the sportsman, what is so interesting as a history of the chase! To those of the present day, what can be so soul-stirring as to recall the memory of the jolly hours they have spent in the full enjoyment of that most passionate of all amusements—"the fox hunt!" How he delights to recapitulate the events of "the find," the burst of "full cry," and the glory of being "in at the death"! And should he wish to have recapitulated to him how his father and grandfather *did the thing* in "Auld Lang Syne," let him read the 14th chapter for information. We quote:—

"To a sportsman, nothing can be so interesting as the legends of the chase. In early days, some two hundred years ago, the higher orders of society took no interest in, and were wholly ignorant of, the science of hunting; and it was many years before periwigs and satin vests gave way to the green coat and brown tops. The only sportsman was the old rough squire, who had never been far from the parlicus of his mansion. The smart sportsman of the present day, who breakfasts at nine o'clock and rides his hack twenty miles to covert, will hardly believe the style and habit of those days. Our ancestors used to breakfast in the baronial hall, on well-seasoned hashes and old October; and the huntsman and whippers-in, in the servants' hall, on the same good cheer. Thus fortified against the morning air, they sallied out at early dawn to enjoy the sports of the field. In those days there were no regular coverts. The whole country was a mass of straggling gorse, heather, or weeds, and it was quite a chance where you could find a fox. The only certainty was getting on a drag and hunting up to him, which was the system invariably pursued. We confess we are at a loss to know from whence the present



splendid foxhound originally sprung. The beagle and the bloodhound are the sorts we chiefly have record of. It might have been a cross between the two. The beagle might have been preserved in its original state, and the bloodhound, with the cross of the beagle, might have constituted the foxhound. Be that as it may, before the days of Meynell the world were in a mist as to the science of the chase. He it was who first introduced quick hunting; he found that the only way to kill a good fox was never to let him get ahead of him. His hounds were quick and powerful, and never hung on the line, but got to head before they began to handle the scent. The consequence was that there was always a body fighting for it, and making the most of it, good or bad, whichever it might be. He had plenty of line hunters; but when the forward hounds struck the scent, they flew to the head, and did not chatter and tie on it. Instead of hunting each other they were hunting the fox. It was delightful to see them come out of covert, when he was away. They did not all go through the same gap, but he the fence what it might, they generally got together, before the leading hounds were over the first field. Before hard riding (that bane of hunting) became the fashion, it is reported that he bred his hounds with more chase than in later days; but when the system of pressing them began, he was obliged to breed them with more hunt, or they could not have kept the line. It was not from their great speed, but from their everlasting going, and never leaving it, which tired the horse and killed the fox."

"Dick Christian's Lecture" is the last chapter, and an excellent wind up to this most amusing work. But we must not forget to call especial attention to the chapter on the breeding of hunters. The information contained—in fact, the epitome of history embodied in it, is well worth double the price of the whole work. Write again, "Good Druid!" May you never lose the graphic power of description so fully and freely given in your "Post and Paddock." We trust you will fulfil your promise given in this edition, that you will "concentrate your energies on a companion sporting work."

ADULTERATIONS DETECTED IN FOOD AND MEDICINE; or, Plain Instructions for the Discovery of Frauds in Food and Medicine.

BY ARTHUR HILL HASSALL, M.D., F.L.S.; author of the "Reports of the Lancet Commission."—Longmans & Co.

A work which should not only make known to us the nature of the various adulterations practised upon our food and medicine, but which should teach us the way to discover those adulterations for ourselves, was much required. Such a work is that before us. It is a particular merit of this work that, while it contains scientific details of high practical interest to the microscopist and the chemist, there are yet interspersed throughout the text such plain and simple instructions and processes, that even the unlearned and unscientific can scarcely fail by their means to discover whether the food he consumes is genuine and wholesome or not.

The interest of the subject of adulteration is considerable; there is not a single individual who is not deeply concerned in it; the consumer is so especially, for he is not only fleeced of his money, but often of his health as well. The sanitary reformer is, because the public health is deteriorated in consequence of the large number of poisonous substances used in adulteration; the statesman, because it is computed that no less than seven millions are annually lost to the revenue through adulteration; the moralist, because the principles of the trading community are lowered by the general prevalence of the practice; and lastly, it is of vital importance to the physician, as medicines are the tools or weapons with which he has to combat disease; and if they are not to be relied upon, how vain become all his best endeavours to cure disease!

But adulteration has especial interest for particular classes

of persons—those pursuing particular businesses or occupations. There is not a tradesman engaged in the sale of articles of consumption that ought not to be familiar with the contents of this work. There is much in it to instruct the agriculturist, the farmer, and the miller. The chapters especially on milk, cheese, flour, and bread should be perused by all such agriculturists as desire that their knowledge of these matters should keep pace with the times. The remarks on the diseases of the cereal grasses are most interesting and important.

A case is made out, in this work, imperatively calling for legislation. If this does not take place, then will matters become ten times worse than before; for all the recent exposures of adulteration will have but served to teach dishonest tradesmen the way to adulterate with greater refinement and success than heretofore. Mr. Scholefield, we believe, was pledged to bring in a bill during the present session of Parliament. Unfortunately this bill will have to stand over for a time. We trust, however, that the delay will but serve to ensure the success of a measure so much required, and of such real social importance.

We can, therefore, most cordially and most conscientiously recommend this work to our readers. The individual who could not succeed in extracting from it, by applying some of the information contained in it to his own particular advantage, and thus paying for the cost of the work ten times over, must indeed be a most passive and uningenious person. Dr. Hassall's powers of observation and analysis are evidently of a very high order, and, judging from the amount of labour involved in this work, his powers of application must be equally great. The cost of the work, considering the number and beauty of the illustrations, is extremely moderate.

## CAN GREAT BRITAIN, WITH HIGH AND GOOD FARMING, GROW FOOD ENOUGH TO KEEP HERSELF?

SIR,—According to the highest authority, Great Britain and Ireland contain about 77,000,000 acres of land; 14,000,000 acres of which are said to be barren and worthless, I mean the surface; and 12,500,000 acres of waste improvable land. Deducting the 14,000,000 acres of worthless land, it leaves 63,000,000 acres to keep the population of Great Britain and Ireland, which is said to contain little under 30,000,000 souls.

Let the reader consider, when the census is taken, how many are under seven years of age, that consume but little food. At that rate there are 30,000,000 inhabitants upon 63,000,000 acres, which is 2 acres and 16 poles for each human being, including children. So that there appears quite land enough to keep our population, if highly farmed, at the same time making the most manure of everything the earth produces yearly, to be returned to the land again, instead of polluting our rivers and manuring the sea, nay, wasting that which would produce great crops of corn, &c.

The wisest of men say that our land is capable of making manure sufficient to support itself, without the aid of guano. Instead of the British farmers laying out millions in guano, let them lay out half the money in foreign oilcake and corn, and convert it into meat, which would produce yearly a vast quantity of beef, mutton, pork, poultry, &c. : nay, after the cake and corn had passed through the animals, would produce great crops of corn, clover, and root crops, and would be doubly advantageous. After deducting the meat from the price the said cake and corn cost, the manure made by the animals that consumed the said food would not come to half

so much as the guano cost. And then a farmer would know what his manure was made of; he would not be bamboozled by adulterated artificial manures. Have all artificial manures analyzed.

When bread got to a famine price, £1 per bushel for wheat, the great statesman, Mr. Pitt, caused bread and flour to be weighed to several families; and he found that a quarter of wheat per head per year upon an average was sufficient for bread and flour. According to this wise statesman's calculation, we only require, with high farming, 7,500,000 acres of wheat, at 4 quarters per acre, to be grown yearly; leaving 55,500,000 acres in Great Britain and Ireland to produce meat and other kinds of food for man, besides bread and flour.

The great-minded Napoleon I. wisely said, "So long as England could keep herself, no country or combination of countries could conquer her; but whenever England became

dependent on foreigners for food, then by a combination of countries England might be conquered by starvation." If so, and it sounds like common sense and reason, why neglect the cultivation of our own soil, and emigrate to cultivate foreign wildernesses, leaving part of England a wilderness at home for the want of cultivation?

Give every British farmer a North Lincolnshire tenant-right, and let them read books upon improved agriculture, like the "Farmer's Magazine," to add more science to practice, and the wildernesses for the want of cultivation in England would soon disappear, and be like Lincoln-heath, once a wilderness, now fine clover and turnip fields. Lincolnshire and Norfolk show what wildernesses in a few years may be brought to, which is a fine example to all the world.

SAMUEL ARNSBY.

18, Norfolk-street, Hyde-park, London, Feb. 25, 1857.

### THE SUPPLY OF GUANO.

The discussion introduced so lately and so opportunely will be useful to many of our readers. One of the chief truths dwelt upon at the discussion at the Farmers' Club—the failing supply of guano—is suggestive of several facts worthy of more than ordinary attention. It will strike everyone as rather a curious, yet gratifying state of our agriculture, when our great farmers have to watch the imports of guano, to note the state of the manure markets almost as carefully as they do those of Mark-lane and Smithfield. This watchfulness is brought about not only by the steadily increasing consumption of the best artificial manures, but by the great variations in the annual amount of imported guano. Thus we find that 2,881 tons of Peruvian were imported in 1841; that this import increased to 283,300 tons in 1845, decreased to 71,414 in 1848; increased to 243,014 tons in 1851, diminished to 123,166 tons in 1853; again increased in 1855 to 305,061 tons, and then fell off to about 200,000 tons in 1856. This falling off, there is little hope, we fear, of being recovered in the early part of 1857. It is true that, whilst we are writing, we are aware that, say 96,000 tons are chartered from the Chincha Islands, and will be gradually dropping in; but it is very doubtful if the majority of this make its appearance until it is too late for spring dressings—and if so, what is to be done? What substitutes can we adopt? Now, at the discussion to which we have referred, Mr. E. Purser told the meeting that in his own experience, and those of other trials he had assisted at, sulphate of ammonia, combined with salt and superphosphate of lime, had proved a most valuable top-dressing for wheat. In confirmation of this statement, let us first remember that the great value of Peruvian guano is found in its ammoniacal or nitrogenous portions. Next let us briefly refer to some of the reliable trials which have been instituted to compare the power of Peruvian guano, as a top-dressing, with that of other well-known manures. We turn to the *Farmer's Magazine*, vol. xlii. p. 404. We find there Dr. Anderson, and two excellent Lothian farmers, carefully em-

ployed in 1855 upon this most important inquiry. (See also p. 15 of Johnson and Shaw's *Farmers' Almanac* for 1856.) Now when Mr. Finnie, of Swanston, top-dressed his wheat with 137lbs. of Peruvian guano per acre, the produce was 5 qrs. 2 bushels. When he substituted 87lbs. of sulphate of ammonia for the guano the produce of wheat was 5 qrs.; with 112lbs. of cubic petre the produce was 4 qrs. 6 bushels. In the trials of Mr. Hope, of Fenton Barns—when after a top-dressing with 137lbs. of Peruvian guano the land yielded 42 bushels of wheat—a dressing of 87lbs. of sulphate of ammonia yielded 44 bushels of wheat. The soil dressed with 112lbs. of nitrate of soda gave 40 bushels of wheat. There were other trials upon grass, potatoes, &c., by the same agriculturists, all tending to prove the same facts, viz., that other well known fertilizers may be readily substituted for guano. For turnips ammoniacal manures are far less needed than for the cereals. We can, for root crops, have recourse to superphosphate of lime, or, what is better, to a mixture of this with crushed and fermented bones. But here another question arises, Will these manures remain at their present prices? We confess we have our misgivings, for the demand for all these has been long on the increase, and the failure of the guano supply will assuredly accelerate the consumption. On one point, however, we have no doubt, and on that we do not address ourselves on this occasion to either the merchant or the manufacturer, but to the consumer. To the farmer, then, we say earnestly, procure your supply, especially of superphosphate, without a post's delay. Do not content yourself with bespeaking it, but have it home, and in a dry store. Rest assured you will get a cheaper, a more perfect manure now—even if the price is not speedily advanced—than if you wait until most farmers are rushing to the dealers for their supplies, and the over-taxed maker is compelled to send out the superphosphate hardly a week old, that ought to have been made at least two months before it left the manufactory. We have written thus earnestly to the farmer since we know full well that these things are apt to escape his notice amid the many cares with which he is attended, and because we are well assured that if he acts upon our suggestions he will have no cause to repent it.

## CANADA AS A FIELD FOR EMIGRATION.

A few weeks ago, in reply to a correspondent, we published some remarks on the best mode of emigrating to Canada. Since then, we have received an extract from the *Canadian News*, a paper published in London, accompanied with a map, on which is delineated the Great Trunk Railroad, recently opened at Toronto, and which already is laid down, we believe, from Quebec to Buffalo, with a branch to Portland in Maine, United States, with the ultimate design of extending it to Halifax, in Nova Scotia, and Frederickton, and St. John's, New Brunswick. Thus Canada West will be at once connected with the Atlantic seaboard, and with all the great Western, as well as the European markets for their produce, without the more tedious transit by lake navigation, which, in fact, is at present insufficient, by the narrowness of the intervening canals, for the increasing quantities that every month sends down.

Our object, however, at present is to apprise those who are desirous of emigrating, that the Colonial Government has determined to give *free grants of land* to eligible persons, and that a large and valuable tract of country has been specially devoted to this purpose. This tract is in Canada West, and is situated on the south side of the Ottawa river, and to the north-west of the Great Trunk Railway, from which a branch will be in a short time carried directly through the district. In addition to which, the Government has directed the river Ottawa to be surveyed, in order to its being made navigable and connected with the western lakes, so as to form a junction with the St. Lawrence more direct than the present circuitous route.

On this tract of land free grants of one hundred acres each will be made to persons of any nation who have attained the age of 18 years. He will be required to take possession of his lot within one month, and to build a house or log hut, at least 20 feet by 18, in which he will have the *free* assistance of his neighbours, according to the usage of the country. He must put into a state of cultivation at least twelve acres of his land in the course four years, and reside upon it during that period. The roads have been made by the Government, but the settlers in future must keep them in repair. Failure to fulfil these engagements will be attended with forfeiture of the land; but their fulfilment will entitle him to the deed of grant from the Government free of all cost. If a family, consisting of several settlers, entitled to lands, prefer living on separate lots, they are allowed to do so provided the conditions above stated are fulfilled on each lot. Thus a freehold estate may be obtained without purchase or expense, over which the proprietor will have the entire control without condition or restriction after the above stipulations have been complied with.

The paper, however, cautions emigrants from sup-

posing that they can succeed on these free grants, or indeed in any part of Canada, without some capital to commence with. It is estimated by the Government agents on the spot, that an emigrant family of four persons, of whom three are young children, will require £45 sterling, or £56 2s. currency, to weather through the first year. And this is independent of hiring himself for four months during the first winter as a lumberer, by which he will earn £42 and his board and washing. He will also be able, if he can purchase a potash kettle, to convert the ashes of his burned timber into three or four barrels of potash, for which he will obtain at the rate of £6 per barrel.

It is calculated that an industrious and able settler can clear eight acres the first season, growing a crop of potatoes on the first cleared. The next spring he can clear two more acres, and may then plant three acres with wheat, five with oats, and two with potatoes. From this time, if he is careful and industrious, and, above all, *sober*, he cannot fail to rise to independence. He will see his cattle as well as his corn increase, and the comforts of a free home gathering round him daily; and, if health and strength do not fail him, there is nothing to prevent his prosperity. His property will not only increase in positive, but in relative, value; for land *uncleared* doubles in value every ten years by the mere increase of settlers. The district on which these grants are made are estimated to be capable of sustaining a population of eight millions, the soil is represented to be equal in fertility to any in the province, and has main roads under construction by the Government to the chief towns in the neighbourhood of the district, independent of the projected railway, which will of course in a great measure supersede other means of transit.

We are glad to see that the Paper in question lays great stress upon one important condition, although it is not included in the Government Rules. We refer to temperance, nay, *total abstinence*, as an essential principle for a settler to adopt and adhere to. "No man can prosper if he be not sober: without sobriety, he will not have strength to undergo the fatigues of his daily labour. And, besides, an intemperate man will immediately become a marked man. In the rural districts total abstinence is the almost-universal practice; and, if the farmers only were to return members to the Legislature of Canada, a Maine liquor-law would be quickly enacted."

Such are the advantages now held out to emigrants by the Canadian Government, and we trust they will not be refused by such of our countrymen as contemplate a removal to that country. Canada is fast rising in prosperity, and will, beyond a doubt, be eventually the most valuable and useful colony belonging to the British Crown. Connected, as Canada-West will soon be, with the Atlantic-seaboard at several of the most

important shipping ports, by the Grand Trunk Railway and its projected branches, the most distant parts will be brought within three weeks' transit of the British shores, where her increasing produce will always find a ready, welcome, and profitable market. If further encouragement is wanting to induce persons to emigrate, let them read the following statement: "The foregoing is no imaginary picture. There are *thousands* of persons in Canada at the present time, who arrived within *the last twelve years penniless*, and are now the cultivators and owners of cleared farms, varying from 50 to

200 acres in extent. Most of them, after earning a few pounds at day-labour, settled down in localities which were then the very heart of the untrodden forest, but are now well filled with a population, every member of which, with scarcely an exception, is *sober*, industrious, and thriving."

We ought to add that the local Government Agents for the lands are, Mr. J. P. French, Mount St. Patrick, county of Renfrew; Mr. Perry, Flush Mills, county of Addington; and Mr. W. P. Hayes, Hastings, county of Hastings, all in Canada-West.

## CALENDAR OF AGRICULTURE.

The sowing of all grain crops must now be finished as fast as possible, and also lucerne and flax-seed. Finish the preparation of grass meadow grounds; sow vetches and grass seeds on wheat and barley tilths. Harrow before sowing the stale surface of winter-fallow wheat grounds, and again after the seeds are sown, finish by a heavy rolling.

Get prepared as quickly as possible the green-crop lands, and towards the end of the month sow beet-root in drills well dunged, and 28 inches apart; steep the seeds in weak solution, and encrust with quicklime. Plant potatoes in drills 30 inches apart, and well dunged with farm-yard manure in a half putrescent state; use large sets of tubers newly cut, moist dung, and in a large quantity. Cover the drills quickly, and roll them down. Before the land is drilled, spread quicklime over the surface in 200 bushels to an acre, and harrow it into the land immediately; or strew the hot cinders over the ground, and the subsequent workings of the land will mix the lime, which will be powdered by the dampness of the soil. This mode requires an earlier application than the old method, but it must be very beneficial to the land, by reason of the warm and moist exhalations evolved during the dissolution of the hot cinders.

Early crops will now require both horse and hand-hoeing, as carrots, lucerne, wheat, beans, and peas.

Paring and burning of lands will now proceed vigorously; burn the turfs moderately into a black torrifried mass, as in that state carbonaceous matter is most abundant. It is the best method yet known for bringing into cultivation all lands that contain much fibrous, inert, and ligneous matters.

Burn, for application by the drop-drill, rough, earthy, and vegetable substances found on road sides and ditch banks. The ashes will often raise good crops of turnips.

Rye, watered meadows, winter barley, and vetches will now be ready for soiling cattle in the

yards, and for being consumed on the ground by ewes and lambs. The food is best used by being cut and placed in racks, and the racks regularly moved over the mown ground. Fold the sheep nightly on the cleared space, allowing in the fold two square yards to each animal, and two nights in one place. All bare grounds and inferior grass lands are much improved by the folding of sheep upon them.

The lambing season will now draw to a close. When cabbages and beet-root fail as food for the ewes, use oats and bruised oil-cake mixed, and a portion of salt. Remove the stronger lambs to the pasture fields.

Attend to the milch cows and suckling calves. Give the former an ample allowance of juicy food, natural or prepared; to the latter as much milk as they will take. When begun to be weaned, at the end of 16 weeks, give to them in racks in the calf pens young vetches, bruised cakes, bean and barley-meals boiled, and linseed jellies. Give them a lump of chalk and of rock salt to lick. The latter substance will quicken the action of the digestive organs, and the former will correct the crude acidities of the stomach.

The last remaining fattening bullocks will be sold during this month. Use oil-cake in finishing off the animals. The most backward in condition must go to grass.

The season of curing bacon being over, all pigs on hand must go on for summer stores, and come in for early winter fattening. The earliest fat lambs will now come in for sale.

During the wet weather, carry all the dung from the cattle-yards to the heaps in the fields, and litter the yards afresh for the summer soiling of cattle and horses.

Prepare by ploughing, harrowing, and rolling the fallows for green crops, keeping most forward the portion to be sown with Swedish turnips the next month. Plough clay lands for a wheat fallow.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR MARCH.

During nearly the whole of this month the weather in all parts of the United Kingdom has been very favourable for agricultural operations. Both ploughing and sowing have progressed rapidly, with the land in fine condition for the reception of the seed; and, with very few exceptions, our accounts respecting the appearance of the winter wheats are very satisfactory. In some parts of England considerable breadths of land have been sown with barley which had originally been intended for wheat, the growers being of opinion that the former produce will turn out more profitable than the latter. It is very probable that such will prove to be the case, because there is still every prospect of a large consumption of barley by the distillers (who still hold an immense number of foreign orders for "raw" spirit), and because the home crop of barley is inadequate to meet any extra demand. Still it is necessary that our barley-growers should bear in mind that they will have to contend against an extensive importation from the continent, and that great heaviness in the wheat trade must have, at least, some influence upon barley. The raw spirit trade is certainly one of very recent date; it has taken from this country an immense amount of spirit, but in the event of there being a good continental wine crop this year, it must of necessity decline, though it can scarcely fall to the level it was a few years since, from the fact that English spirit is now much preferred in France to that originally imported from Holland. The consumption of barley will no doubt be very large, and every quarter imported will be used for various purposes; still it becomes a question how far it is prudent to displace much wheat for the production of spring corn. As regards barley, however, as a paying crop, it has certainly a prospective advantage when compared with wheat. The demand for the latter for several months has been wholly confined to immediate wants; the importations (notwithstanding that there has been a good export trade) have resulted in an accumulation in warehouse. Money has been very scarce and dear, and there has been a total absence of all speculation. The quotations have, therefore, gradually given way. Great losses have been sustained by most of the importers, both from the continent and the United States; and the season has opened with every prospect of very large arrivals from almost every quarter of the globe. The bad condition in which the bulk of the English wheats have been shown has added to the dulness in the trade, which has certainly been in a most unsatisfactory state; and the question is, what feature is there in it calculated to improve its general bearing? Speculation in wheat is very distant. Very little grain is now held in continental ports on English account; and there is a vast amount of supply to come forward from the north of Europe as well as from the westward—indeed, we are of opinion that with a full average crop at home, wheat will be much lower towards the end of the year than it now is, and this conclusion is the more forced upon us from the nature of the advices which have lately reached us from Russia, which refer to large stocks of produce in the interior of the country, and

the rapid extension of cropping both in the north and south. The return of vast numbers of people to industrial pursuits must have its accustomed influence upon the produce of the soil; and no doubt great efforts will be made this year to furnish Europe with more than usual supplies of grain. Under these circumstances an active corn trade cannot be anticipated; indeed, present indications are the reverse of this, more especially as the stocks of English wheat still on hand are seasonably extensive. There may be some parties inclined to doubt the truth of this assertion; but a strong proof in its favour is the fact that, for some time, local wants have been met from local sources, and that scarcely any foreign grain has been purchased at the outports for inland consumption. Now, a deficient crop in England is sure to be followed by an outport demand, which has considerable influence upon price, not only here but throughout the continent. As yet, nothing approaching scarcity is complained of in any quarter, and we conclude, therefore, that our farmers hold an average supply of wheat for the time of year.

Last season's crop of potatoes, both in England and Scotland, has turned out considerably in excess of many estimates submitted, even by the growers themselves; there cannot, indeed, be the slightest doubt on this head. The metropolitan and other markets continue to be well supplied with most kinds in fair condition; and some rather important arrivals have taken place into London from Holland. This abundance has naturally had some effect upon the grain trade, because it tends to lessen the consumption of bread.

The result of the sales of colonial wool held during the month has been highly satisfactory, from the fact that prices have advanced from 1½d. to 3d. per lb. At that improvement nearly 50,000 bales were disposed of. Notwithstanding this rise in the quotations, the demand for English qualities has fallen off, and, in some instances, the currencies have declined 1d. per lb. This fall must be attributed to the high value of money, and the anxiety manifested by our flock-masters in disposing of the new clip. Present prices are certainly a great inducement to get rid of stock; and we are now of opinion that wool has reached its highest point of value. Our present clip is turning out a large one: we have had extensive importations from Australia and the Cape since the middle of the month, and it is very possible that nearly 60,000 bales will be submitted for competition at the May sales.

Both meadow and clover hay has sold slowly throughout the month, arising from the increased supplies on offer; but straw has slightly advanced in value, the top quotations being 30s. per load. The quantity of hay on hand is the largest we ever remember at this season.

Compared with many former years, the cattle trade has been in a healthy state. The supplies of stock brought forward have been very limited.

In Ireland agriculture appears to be prospering. Throughout the best districts a great improvement has taken place in the mode of cultivation, and we have every reason to anticipate very large exports of stock to England during the summer months. In the event of our expectation,

being realized, the falling off in the importations from the continent will be less severely felt by the consumers, as a further rise in our quotations may thus be prevented. From Scotland we learn that the new wheats are turning out very deficient in quality, and that large quantities have been disposed of as low as 40s. per qr.

The early lambing season has gone off well, and the losses from inclement weather have been less serious than in some previous years.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the fluctuations in the value of live stock, owing chiefly to the changeable state of the weather, have been more numerous than in the previous month, and on the whole a slight decline has taken place in the quotations, the cattle trade has been in a healthy state since we last wrote. The supplies of both beasts and sheep exhibited in the Metropolitan Market have been comparatively trifling in number, but decidedly above average quality, especially as regards the latter; but the receipts of Scotch and country-killed meat up to Newgate and Leadenhall have been on a very extensive scale. Surprise has been expressed in some quarters that, considering the amount of supply furnished to the great market in London, prices have not advanced even beyond their present range; and not a few persons contend that consumption has fallen off. All acquainted with the trade must be aware that, even though trade generally is prosperous, and the working classes are well employed, a high value of meat is most prejudicial to the butchers in various ways. The purchases are, therefore, wholly confined to immediate requirements, and the butcher obtains the largest portion of his supply from the dead markets. Then, again, the wants of local districts are now chiefly supplied by means of local markets, and the enlargement of those of long standing; nevertheless, with all this competition—which, by the way, renders it less necessary to purchase largely in London for distant localities—all kinds of stock continue to command very high prices. In a comparative sense the breeders are reaping great advantages, and the most successful graziers are making large profits. That prices will continue high for a considerable period, is to our minds fully apparent: for what, in point of fact, is there in the present state of things calculated to depress our markets? The commercial interest is in a state of great prosperity, even though money is very dear, and our home and foreign trade is equally satisfactory: hence, an advance of one penny per pound in the price of meat cannot be so much a matter for serious consideration as in periods of commercial distress. But we find the theory broached that the quantity of live stock in the United Kingdom has considerably decreased of late years, owing to the influence of certain laws. We maintain that the supply has not increased so much as could be desired, but there is no warrant for assuming that scarcity is apparent in any of our great districts. For what feature, we will ask, can be adduced in support of the doctrine of a deficient home supply? True, in 1855, the season was an unfavourable one for the rearing of stock, owing to the deficiency in the hay and root crops; and in that year, as well as in 1853 and 1854, immense numbers of both beasts and sheep were hurriedly forced for sale in a half-fat state. It will be recollected that we warned the breeders and graziers of the evils that might eventually arise from what we considered an unnecessary destruction of property; but we were met

by the observation that there was not an amount of food in the country sufficiently equal to the wants of the stock, and, further, that sheep 16 to 18 months old paid better than if kept for a longer period. That system, however, is, we find, being steadily abandoned. Its abandonment must lead to high quotations for a period; but we do not hesitate to say that eventually it will be productive of the greatest advantages to the country at large. No doubt the principal cause of the present high range in the quotations is the limited amount of live stock imported into England from the continent; and the future state of our markets seems to forbid any great increase in the arrivals, owing to the great wants of France and the miserable condition of French agriculture, which, as regards the production of sheep, is thus referred to in one of the leading French papers:—

“In both countries an equal number of sheep is bred; this number is about 35,000,000 head. The 35,000,000 in the United Kingdom live on 31,000,000 hectares (2½ acres), while the 35,000,000 in France live on 53,000,000 hectares. It therefore results that on an equal extent of territory the English breed two sheep where we only breed one. This is not the sole difference. In many of our departments the production of fine wool has been encouraged, to the detriment of the production of meat. The English have sent their fine merinos to Australia, where they prosper admirably, and their whole attention is devoted to the production of meat. It thence results that the 35,000,000 French sheep produce annually 60,000,000 kilogrammes (2lb.) of wool, and 144,000,000 kilogrammes of meat; while the 35,000,000 English sheep produce annually 60,000,000 kilogrammes of wool and 360,000,000 kilogrammes of meat. The proportion of mutton produced in France and England exists in the very disproportionate figures of 144 to 360. And in these figures we have compared France with the British Isles, thus comprising the hilly regions and moors of Scotland, as, likewise, the poorer districts of Ireland. Were we to confine ourselves to England proper, the contrast would be even greater. England breeds two sheep per hectare against two-thirds of a sheep bred by France; the produce of an English sheep is more than double that of a French one.” The writer goes on to compare our produce of other meat with that in France, and arrives at the same results, viz., that English agriculture is far in advance of the continent. Possibly this is a fact pretty generally known; but we refer to it chiefly for the purpose of showing that France, like ourselves, is not in a position to meet any extra demand, which must of necessity be met from other sources, and contribute to raise the necessaries of life, if not permanently, at least for a season or two.

The annexed return shows the imports of foreign stock into London during the month:—

Beasts.....	1,719 head.
Sheep .....	3,123 „
Calves .....	573 „
Pigs .....	4 „
	Total .....
	5,419
Same time in 1856 .....	1,842 head.
„ 1855 .....	2,103 „
„ 1854 .....	3,409 „
„ 1853 .....	10,884 „
„ 1852 .....	6,747 „
„ 1851 .....	8,381 „
„ 1850 .....	6,004 „

The total supplies of stock, derived from all sources, shown in the Great Metropolitan Market, have been as under :—

Beasts.....	17,345 head.
Cows .....	490 „
Sheep.....	74,880 „
Calves.....	1,118 „
Pigs .....	2,230 „

COMPARISON OF SUPPLIES.

March	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1856....	22,623	470	100,700	797	2,140
1855....	18,644	380	88,790	835	2,765
1854....	20,583	532	93,060	1,091	2,780
1853....	19,228	360	85,680	1,614	2,780

From these figures we might be led to conclude that the consumption of meat in London is falling off. We have already referred to the rising importance of some of the local markets, and it is necessary to explain that the traffic in dead meat, arising from the rapid extension of railway communication, is yearly becoming more general and extensive. Consumption is now chiefly met from the dead markets, and no doubt the present altered mode of supplying London will extend itself more especially in the event of wool, hides, &c., keeping at their present high value. In the provinces there is a great demand for those articles, and which are easily disposed of by those who slaughter extensively without incurring the expenses of carriage and commission.

Very few lambs have been on sale in the metropolis, yet the demand for them has ruled heavy. In the early part of the month the best Down lambs sold at 3s. per 8 lbs., but prices towards the close settled down to from 6s. 8d. to 7s. 4d. per 8 lbs. Out of the 17,880 sheep in the market, nearly 7,000 came to hand out of the wool, and they went at from 10d. to 1s. per 2lbs. beneath those in the fleece. This is the greatest difference between the value of shorn and unshorn sheep we ever recollect. The general quotations have ruled as follows :—

		s.	d.	s.	d.
Beef, from .....	3	4	5	0	
Mutton.....	4	2	6	0	
Veal .....	4	4	5	8	
Pork .....	3	6	5	2	

COMPARISON OF PRICES.

	March, 1854.			March, 1855.			March, 1856.				
	s.	d.		s.	d.		s.	d.			
Beef, from...2	10	4	8	3	4	5	0	2	10	4	10
Mutton.....3	2	5	2	3	4	5	2	3	2	5	2
Veal .....	4	4	5	8	3	10	5	4	10	6	0
Pork .....	3	4	4	10	3	2	4	4	3	4	4

Compared with the previous month, we have had a slight falling-off in the quality of most breeds of beasts; but the sheep have, for the most part, come to hand in unusually prime condition. In the leading districts the health of the stock continues good, and there is a great abundance of good wholesome food.

The month's arrivals of beasts from Norfolk, Suffolk, &c., have rather exceeded 10,000 Scots and shorthorns. From other parts of England 2,500 of various breeds have come to hand; whilst the receipts from Scotland have amounted to 1,500 Scots, and from Ireland, via Liverpool, 308 oxen.

Newgate and Leadenhall have been heavily supplied with meat, for which the demand has ruled steady. Beef has

sold from 2s. 10d. to 4s. 6d.; mutton, 3s. 4d. to 4s. 8d.; veal, 3s. 10d. to 4s. 10d.; pork, 3s. 8d. to 5s. 4d. per 8lbs., by the carcase.

WEST GLOUCESTERSHIRE.

The weather during the present month has been characterized by the usual vicissitudes of the season, more rough and boisterous, however, than that which was experienced throughout the preceding one, with considerably more downfall. Keen frosts, with occasional storms of hail, sleet, and rain, have operated in checking precocious vegetation, which from the mildness prevailing throughout the month of February was generally anticipated, providing that temperature had continued. The present appearance of the autumn-sown wheat does not call for any deviation from the last account. It is here necessary to remark that the samples of grain brought into the markets evince scarcely any improvement in condition, although the drying and piercing winds which have been experienced might be expected to have exercised a beneficial effect. There is manifestly some cause for this, irrespective of the rainy condition of the weather during the greater portion of the time when the grain was being harvested; and the assumption expressed in the last report, that the indiscriminate use of artificial fertilizers had in some measure an influence, is to a certain extent strengthened. It is a question not unworthy of investigation. Artificial manures, when extensively applied, have the effect of producing very luxuriant, pleasing, and flattering appearances; but the profitable results, in other words the yields of the crops, are not in all cases commensurate with these appearances. The continuously receding state of the markets for home-grown wheat indicates the inferior condition of the bulk; for even at this period of the year there are very few samples of a quality fit to work without admixture of foreign grain. The operations of the month are in a satisfactory state of forwardness; the planting of beans is very generally finished, and a considerable portion of the oats and barley is already sown. Taking a glance through the country, the turnips and swedes appear to be nearly exhausted; but as there is a considerable quantity of roots that have been providently housed, a correct estimate cannot be formed, and the inference gained by inquiry leads to the impression that there is a full average quantity in store, quite sufficient to last till the period arrives when spring-keep may be anticipated. The hay holds out well. Grass lands, however, which at the early part of the month began to exhibit slight symptoms of assuming a vernal tint, have from the late frosts, cold rains, and bleak winds, sustained an unmistakable check. At one period everything was promising for an early spring. The case may now be altered; yet it is premature to express an opinion, so much depends upon the temperature of the month to come. The earth at present is not surcharged, with rain, and genial showers in April, together with gleams of warm sunshine, will soon throw the vegetable kingdom into a state of luxuriant beauty. The supplies of beef and mutton are by no means abundant, and there is every prospect that a considerable deficiency will be experienced. There is not any epidemic disease to create alarm in this country, but in the event of the murrain increasing on the continent, we may certainly expect a greater demand than our own resources can adequately supply. Veal in this neighbourhood is plentiful; at this season of the year it is so almost invariably. Few of the farmers in this part of Gloucestershire are accustomed to rear a greater number of calves than they absolutely require to maintain the strength of their dairies, and the present price of meat is a temptation to take everything to market that is in fit condition for the purpose: the ready penny principle more generally prevails over the deferred interest, which may be associated with the rearing of an extra quantity of stock.

## SOUTH LINCOLNSHIRE.

The past month has kept up its ancient character, and its very old designation, "March many weathers"; indeed, the whole winter, although a very favourable one, may be said to have consisted of three or four distinct winters and summers, alternating surprisingly both in cold and heat. We have not much to report upon in the course of business. Beans, peas, barley, and oats, have each gone in exceedingly well, and very little remains to be put in. Many of our farmers have commenced potato planting. The fallows are very forward, and work well. All kinds of stock have done well. Sheep have thriven surprisingly. The great abundance of keeping, in both turnips and mangel wurzel, is the theme of general remark, and consequently store stock is relatively high in price, and large supplies are coming into the market. The corn trade has been gradually drooping throughout the winter, and has not yet made a decided stand. I do not mean to croak, but I must, as a faithful reporter, state that the frequent and violent changes of weather we have experienced has at length told upon the young wheats. Clover and seed-lands are looking unusually thin, and great loss of plant has been general. I looked upon this loss as partial in the past month, but I am convinced it has spread much further than I anticipated; however, by careful attention to rolling and repeated hoeing, much may be done to restore the sickly plants, and cause the filling up of thin ones. The lambing season, thus far, has been favourable, and "good luck" has been the result. The fall of lambs not abundant, but strong and vigorous. Ewes have plenty of milk. Political excitement is just now stirring up our low-country farmers into energetic action. South Lincolnshire has not had a contested election for 16 years; and so reluctant are South Lincolnshire men to engage in such contests, that had fair-play been then dealt to that deservedly popular member and deeply-lamented man, the late Henry Handley, no contest would then have taken place. The aristocracy and clergy, however, determined to turn him out; sooner than cause great dissension, and possibly much oppression, Mr. Handley resigned. This becoming known, created great indignation amongst his chief supporters, the small freeholders and tenant-farmers; and they determined, if possible, to "bring him in" by their own spontaneous and unaided efforts. This caused one of the most exciting and interesting elections on record. The division is now called upon again, but the enthusiasm is by no means great. The nomination is fixed for Wednesday, April the 1st. Farmers ought to be extremely cautious in choosing their members. *Free trade with all the world* should be rung in the ears of every agricultural member, and it ought to prompt him to do his utmost to take off every restriction and hindrance likely to arrest the farmer's progress. Agricultural members must closely study the bearing of such questions on agriculture, with a view to their removal or amelioration, as the malt tax, the hop duty, the poor's-rate or union-rating, county rates (now under magistrates), highway rates (so that they be extended to district surveyors), church rates, tithes (so that the local averages shall rule local tithes), also the prohibitions and restrictions upon growing tobacco, chicory, hemp, flax, &c., and the manufacture of sugar, malt, &c., also the regulations relative to the uniformity of weights and measures, the collection of agricultural statistics, and the extension of the rural franchise; and agricultural members have much to do, and much to answer for, to their constituents.

## DURHAM.

The month of February came in with sharp frost and a heavy fall of snow, which quickly disappeared on the 6th and following days; since then and up to the end of the month the weather has been quite unprecedented for its unusually mild and dry state. The land that had been some time ploughed was in fine order, being well pulverized by the frost, inducing farmers in many localities to sow oats, which we think rather too early in the season. A large breadth of spring wheat and beans was sown under most favourable and satisfactory auspices. Oat sowing is now drawing fast to a close, and barley will be committed to the ground in a few

days. About the end of the month sowing will be nearly brought to a conclusion; and we have no recollection of ever experiencing a finer seed-time than the present. The autumn-sown wheat is very promising, with no indication of premature luxuriance. Farmers thought it was hazardous sowing the sprouted seed; but we have not observed any thinness of plant. The corn exposed to the wet season in harvest was all unsound, and millers will not give more than 1s. per stone for it, being still very much out of condition; and the same remark applies to every other grain that was not secured previous to the wet season setting in. During the last season it was found that the crops on the land in the highest state of cultivation and under good farming sustained more injury from the incessant and drenching rains than the inferior lands and such as were not well managed. A corn crop is very different from a green one. In the former crop too much manure can easily be applied, but in the latter case can rarely be applied in excess. The clovers on the best cultivated lands are generally found a failure from the lodged corn, and also the grain and straw are of inferior quality, and yield deficient. It is certainly better to apply too much manure than an insufficient quantity: in the latter case the land becomes foul and unprofitable. Potatoes have kept badly in pits, being much diseased, and selling at 14d. per peck. Our fat stock markets are well supplied at good prices; neat keepers from 8s. to 8s. 3d. per stone; nice widders, in the wool, 9l. per lb. Wheat very dull sale, and prices have a downward tendency. At Darlington, on the first Monday in March, hind's wages were 1s. per week lower than they were last year, say from 13s. to 14s. per week, with house and fire and perquisites. Draining has not proceeded so briskly as it had done lately: a good many hands have been out of employment.—March 20.

AGRICULTURAL INTELLIGENCE,  
FAIRS, &c.

BANBURY FAIR was well attended by buyers and sellers, the town being crowded, and business very brisk. The beef fair was well supplied for this time of year, and fat beef sold from 4s. 6d. to 4s. 8d. per st. Stores were in very large numbers, and sold at high prices, there being a good demand for superior beasts. In the sheep department the supply was not very large, but they sold at very high prices; shorn sheep from 4s. 6d. to 4s. 8d., and in the wool 5s. 6d. to 6s. per 8lbs. Mrs. Rymill exhibited a splendid ewe, nine years old, bred and fed by Mr. Cother, which weighed 61lbs. per quarter. The horse fair was unusually well supplied, but only the good horses sold well and quickly.

BEDALE FORTNIGHT FAIR.—We had a good show of fat stock, which sold readily at previous rates. Lean stock went as usual. A large number of in-calfing cows had good sale, at the full prices of last market. Beef 7s. to 8s. per st., and mutton 7½d. to 9d. per lb.

BRIDGORTH FAIR.—Stock was not superabundant, but good in quality, and unusually high-priced. Sheep sold at as high as 9d., and even 9½d. per lb. Beef was also very dear; good fat cows fit for the butcher fetching as much as 7½d. to 8l. Cows and calves were also high-figured. Pigs were few. The horse fair was well supplied with good, useful breeds; but prices were so much advanced that buyers held aloof and few sales were effected. There was a small quantity of cheese in the fair, which sold at the usual prices.

BROMYARD FAIR.—There was a plentiful supply of steers, cows, and calves, and barrens, all of which found ready purchasers at good prices. Fat cows brought from 7d. to 7½d. per lb.; couples, of which the supply was short, fetched from £2 2s. to £2 10s. per couple. Few pigs on offer, and these brought a high price. In the horse fair there were but a few good animals, which obtained high rates.

BROUGH FAIR.—Cattle-dealers from all quarters again came in numbers, and all beasts arriving on the evening previous were bought up. Next morning betimes the jobbers were intent on their business, meeting the farmers coming to the fair with their stock on the Appleby road, for several miles, and bought up scores before they got into the market. The fair-stand was completely cleared out by one o'clock. We need not enlarge further, only just to say that present calves



fetched from £11 to £12, to as far as £22—£25 being asked in some instances; in fact, if there was anything in the shape of a beast there was a buyer.

**KELSO FORTNIGHTLY MARKET.**—There was a good show of fat cattle (though not so large as usual at this time, owing to a great many being sold at home), a number of the lots of which were of excellent quality. There was a good attendance of buyers, and a brisk demand for cattle at 7s. 3d. to 7s. 9d., and some at about 8s. per stone. There were a number of lots of Sheep, amongst which was a small lot clipped, which were not sold. Sheep sold readily at from 7½d. to 8d. per lb. A full market of cows, which met with a good demand, and mostly all sold. Bred cows from £14 to £19. Ayrshire from £9 to £13.

**LINCOLN FAT STOCK MARKET.**—There was a fair show of sheep, but of beasts the market was not well stocked. Prices were up, mutton ailing at 7½d. per lb. (clipped sheep), mutton in the wool, 9½d.; beef, 8s. to 8s. 6d. per stone.

**MUIR OF ORD MARKET.**—The March fair is almost exclusively for hogs, but the abundance of keep this year in the north induced dealers to hold back till next month, except to a comparatively limited extent. The number of sheep was only 3,674, the smallest number shown at Muir of Ord in March for many years. Of these the majority were small lots, but some very fine Cheviot wether hogs were shown, two pretty large lots commanding particular attention, one belonging to Capt. Macleod of Orbost, and the other to Mr. Stewart Macrae, Auchmore. The first of these was sold at 22s. 6d., and the other at about the same figure; but having been sold along with some cross Leicesters, bringing the price of the whole to 23s. a-head, we cannot state the precise figure. A large lot divided into two was sold by Mr. Kenneth Macrae, Auchmore, at 22s. Mr. Clarke, Eribol, bought a lot at 20s. a-head. These were the principal lots of wether hogs disposed of. Others were sold at a less figure, or in small numbers suitable for special purchasers, and the price of which did not affect the market. A good many Leicester cross hogs were exposed and were in demand, one lot having been purchased in the early part of the day, and disposed of again on a rise of about six per cent. Mr. Winton, Ardarsier, bought a very fine lot at 26s. Mr. Cameron, Dreim, bought the Kinnetes crosses at 24s. 6d. Mr. Fenton, Conon Mains, sold at 24s., &c. Though the prices, as will be seen, are very high, the market was stiff, and several of the smaller lots remained unsold at the end of the day.

**NORTHAMPTON FAIR** was fairly supplied with mutton, but short of beef, the former realising as much as 6s. per stone in the wool, and 5s. out of it. Beef also made 5s. per stone. Every description of store stock was very dear, and high prices are still the order of the day.

**PAIGNTON MONTHLY MARKET.**—A large quantity of fat stock sold readily. Fat bullocks from 63s. to 65s. per cwt., store bullocks 45s.; cows and calves from £16 to £20; sheep, 8½d. to 9d. per lb.; fat lambs 24s. each.

**ROSS FAIR.**—There was an average supply of stock, which readily sold at advanced prices. Mutton averaged 9d. in the wool; some prime lots reached a higher figure. Beef realized 7d. to 7½d. Pigs dear. The supply of horses was pretty good, but not large. Good animals were sold at high prices. The weather was very fine, which caused business to be brisk, and as on former occasions the fair was cleared soon after mid-day.

**SHREWSBURY FORTNIGHTLY MARKET.**—We had a good supply of store cattle; but sheep were very scarce. Best fat beef made 6½d. per lb.; inferior cows a shade below; fat calves, 6½d.; useful stores and cows and calves selling at high prices; fat wethers from 8d. to 9d. per lb.; couples of ewes and lambs from 35s. to 58s.; fat pigs, 6d. per lb.; stores rather lower.

**STAMFORD HORSE FAIR.**—There was an average show of all kinds of animals; as usual, really useful horses were in short supply, and the demand being great, very high prices were realized; inferior animals met a slow sale at indifferent rates.

**TADCASTER FORTNIGHT MARKET.**—We had a fair supply of stock to-day. Beef, 7s. 6d. to 8s. per stone; mutton, 7d. to 8½d.; veal, 7½d. per lb.

**TALGARTH FAIR** was not so well supplied with horned cattle as usual, nor with so many horses, sheep, or pigs, but for those on offer high prices were asked, and in many cases obtained.

**TENBURY FAIR** was very thinly attended. Little stock of any description, and a small attendance of dealers. Business very flat.

**WORCESTER FAIR** was but moderately supplied with stock, but the attendance of buyers was more than usually numerous. Beef sold readily at from 7d. to 7½d.; mutton commanded very high prices. Pork 10s. 6d. to 11s. per score; store pigs dear. In horses a good business was done, superior animals being readily disposed of. There were several auction sales.

**YORK FORTNIGHT MARKET.**—Calving and dairy cows were in good supply and demand, at about late prices. Plenty of lean beasts were shown, but many were unsold, although rates tended downwards. Fat beasts were rather scarce. A good supply of mutton sheep had rather slow sale at 8d. to 9d. per lb. Grazing hog sheep were plentiful, but the demand was heavy at fully 2s. to 3s. per head lower, with many unsold.

**NAVAN IRISH FAIR** was, in every respect, one of the largest and best which has been held here for many years, each department being well furnished with a stock of a very superior class, which met a ready sale, the demand having far exceeded the supply. There were several cattle-dealers from the other side of the Channel, who purchased largely for the English market. The Earl of Mayo sold a lot of fat bullocks at £22 17s. 6d. each; John O'Reilly, Esq., Athboy Lodge, sold a lot of fat heifers at £20 each; Mr. McEvoy, Nobber, sold a lot of fat heifers at £17 each; Messrs. Gough and Donnelly, Navan, purchased a lot of 75 fat heifers at from £17 to £22 each, for the English market; P. P. Metege, Esq., J.P., Kilmairne, sold a lot of fat bullocks at £27 each; Edward Tynan, Esq., Baluaack West, sold 16 fat store heifers at £14 each; Mr. Tully, Kilskeer, sold 12 store heifers at £10 10s. each; Mr. Edward Keirnan, Athboy, sold 12 store heifers at £11 10s. each; James Cruise, Esq., Fennor, Slane, bought 20 store heifers at £8 each; Mr. James Cregan, Commoos, bought 7 springers at from £12 to £15, and sold them again at from £13 10s. to £16 each; Mr. Michael Sheridan, Canistown, bought 4 springers at from £14 to £18 each; Mr. Crumion sold a lot of springers to Mr. Smyth, of Navan, at £14 10s. each. The sheep fair was well stocked, principally with mutton and store lambs, both of which sold extremely high; mutton at 8½d. to 9d. per lb. The pig fair was one of the largest held in Navan for the last twenty years. Bacon sold at extremely high prices, the average prices were from 58s. to 64s. per cwt.

## THE LATE MR. H. CHAMBERLAIN'S STOCK SALE, DESFORD, LEICESTERSHIRE.

This important sale of celebrated stock of Hereford cattle and Leicester and Southdown sheep took place at Desford, on Tuesday and Wednesday, March 3 and 4, Mr. J. Holland, jun., officiating as auctioneer. Mr. Chamberlain's reputation as a breeder and feeder being so well known, there was a large assemblage of gentlemen interested in the breeding of stock from all parts of the kingdom; and the competition for the most valuable lots ran very high. Amongst those present, and who were purchasers, were—Messrs. Chifford, Abel, Harrison, Tunnicliffe, Drakeley, Boot, Merryman, Jordan, Wagstaff, West, Hill, Bailey, Townsend, Strafford, Breedon, Allen, Adcock, Jackson, Painter, Dewes, Stephens, Matts, Watson, Wayte, Hull, Webster, Chapman, Ivens, Hands, R. Kirby, Whattoff, Thompson, Wragg, Powers, Hughes, Sharpe, Cooper, Winterton, Bucknill, Underwood, Burdett, Creswell, Spencer, Fox, Apperley, Henshaw, Swinnerton, Gilbert, Frost, Humphreys, Reeves, Wright, Lynes, Abbey, Perkins, Brickwell, Daveys, Buckley, Smith, Kenney, Robinson, Brown, Hopkinson, &c., &c. The following are the principal prices realized for some of the sheep: Fat New Leicester wethers 75s., do. do. theaves 51s.; fat Southdown wethers 78s., do. do. ewes 58s., do. do. theaves 48s.

6d.; in-lamb New Leicester ewes 81s., do. do. theves 83s., do. Southdown ewes 78s., do. do. theves 73s. Store sheep: New Leicester ewe lamb-hogs 61s., Southdown ewe do. 50s.; wether lamb-hogs 53s., Southdown wether do. 50s. Hereford cows and calves realized the following prices: Snowdrop £19 8s. 6d., Plumb £20 9s. 6d., Clarke (with her calf) £18s. 18s., Daisy £19 8s. 6d., Stately £24 3s., Spot £20 9s. 6d., Handsome £21 10s. 6d., Countess £19 19s., Rose £20 9s. 6d., The Queen £21 10s. 6d. Hereford heifers: Snowdrop £24 3s., Sprightly £22 1s., Rose £20, Beauty £22 1s., Handsome £31 10s., Stately £20 9s. 6d. Shorthorn heifers: Princess Royal £34 13s., Alice £17 6s. 6d., Cassy £18 18s. Hereford heifers (under two years) realized from £11 to £16 each, Hereford yearling heifers from £8 to £20 each; Hereford oxen from £22 to £55 each; bulls £27 6s. and £21 each. Yearling Hereford steers: 1st steer £24 13s. 6d., 2nd do. £23 2s., 3rd do. £22 1s. Hereford barren cows from £15 to £20 each. Horses: Duke £42, Smiler £63, Ranger £39 18s., Mettle (in foal to England's Glory) £33 12s., Boxer £44 2s., Trimmer £43 1s., Barney (in foal to Ironsides) £30 19s. 6d., cart foal (by England's Glory) £21, hackney chesnut horse £22 11s. 6d. Pigs from £3 to £9 10s. Wool 47s. 6d. per tod.

THE SWEDE TURNIP CROP.

Mr. S. Pinder, junr., in a letter to the *Nottinghamshire Guardian*, says: There is an old adage, viz., "What is the use of a cow giving a good deal of milk, if she immediately kicks it all down?" The like question may be now raised relative to the growing of swede turnips; that is to say, "What is the use of producing such large quantities of swedes, to be reserved in heaps for spring use, by the application of Peruvian guano, when they are found to rot by wholesale, while those produced by the simple application of farmyard manure are generally found to be sound?" If the evidence of the farmers themselves and others interested in the growth and production of large quantities of swedes is to be relied on, the farmers of Laxton, although not extensive growers, and other farmers living in a considerable circle of country round Laxton, are large sufferers by the Peruvian guano-grown swedes again this spring. Numbers of persons who have heaped with care for early spring use have found, to their great mortification and loss, their heaps more or less affected with decay and rotteness. But, notwithstanding their loss, they have yet an opinion that Peruvian guano cannot easily be beaten; whereas it has been shown in the *Guardian* that Bolivian, Saldanha Bay, and Patagonian guanos are much more advantageous for the turnip crop, as they contain more phosphates and much less per centage of ammonia than the Peruvian, and the subjoined list by Dr. Voleker will show that superphosphate of lime is superior to any one of them:—

"Table showing the produce of trimmed Swedes of experimental plots of one-eighth of an acre, and weight of crop per acre:—

Plot.	½ Acre.	
	tons cwt lb	Per Acre. tons cwt lb.
1. Guano yielded.....	1 9 7 ..	11 12 56
2. Guano and dissolved coprolites yielded.....	1 12 2 ..	12 16 16
3. Bone dust yielded.....	1 2 0 ..	8 16 0
4. Bone superphosphate yielded..	1 14 2 ..	13 12 16
5. Economical manure yielded ..	0 15 2 ..	6 0 16
6. Nut refuse yielded.....	1 5 0 ..	10 0 0
7. Dissolved coprolites yielded ..	1 9 0 ..	11 12 0
8. Nothing yielded.....	0 13 0 ..	5 4 0
9. Commercial dried night soil yielded.....	1 3 0 ..	9 4 0
10. Mixture of soot, guano, dissolved coprolites and bone superphosphate yielded ..	1 5 1 ..	10 8 0

"Table showing increase per acre and cost of one ton of increase, in ten experimental trials of Swedes:—

No.	tons cwt lb	£ of increase.
1. Home-made superphosphate ..	8 8 16 ..	0 4 2
2. Dissolved coprolites and guano ..	7 12 16 ..	0 5 3½
3. Guano.....	6 8 56 ..	0 6 2½
4. Dissolved coprolites.....	6 8 0 ..	0 6 3
5. Mixture of guano, soot dissolved coprolites, bone and superphosphate.....	4 16 8 ...	0 8 3½
6. Nut refuse.....	4 16 0 ..	0 8 4
7. Commercial night soil.....	4 0 0 ..	0 10 0
8. Bone dust.....	3 12 0 ..	2 11 1½
9. Economical manure.....	0 16 16 ..	2 9 6½
10. Nothing.....	0 0 0 ..	0 0 0

"Natural produce, 5 tons 4 cwt.

"These tables deserve a careful examination, for there is an immense difference to the grower betwixt increasing his produce at a cost of 4s. 9d. a ton and 49s. 6½d. a ton.

"The above experiments were tried on a naturally poor, shallow soil, resting on limestone rock, from which it was separated by a clayey subsoil of considerable depth.

"The value of guano is principally regulated by the proportion of ammonia it contains or furnishes on decomposition, and ammonia does not benefit root crops in an equal degree as white crops, whereas phosphate manures exercise a specific action on roots, which causes them to swell and thus to increase the crop."

Query for our Royal Agriculturists.—As ammonia does not benefit root crops in an equal degree as white crops, is it injurious to the root crops, and a forerunner to rotteness in turnips?

AGRICULTURAL MEETINGS IN 1857.

- APRIL 6, 7, and 8.—International Fat Cattle Show, at Poissy, ten miles from Paris. Particulars, prize lists, &c., to be had of, and entries made by March 10, Mr. Braadeth Gibbs, Half Moon-street, Piccadilly, London.
- APRIL 21, 22, 23, and 24.—Royal Dublin Society.—Spring Cattle Show, at Dublin. Entries close March 26. Secretary, Mr. E. Steele, Kildare-street, Dublin.
- MAY 22.—Royal Agricultural Society of England.—General Meeting in Hanover-square, at twice o'clock.
- JUNE 3, 4, and 5.—Bath and West of England Society.—Meeting at Newton. Entries close April 5. Secretary, Mr. St. John Maale, Pultney-street, Bath.
- JUNE 10.—Oxford Amalgamated Agricultural Association.—Meeting at Oxford. Entries close May 1. Secretary, Mr. G. F. Druce, Oxford.
- JUNE 24.—Norfolk Agricultural Association.—Meeting at Swaffham. Entries close May 30. Secretary, Mr. E. C. Bailey, Orford-street, Norwich.
- JULY 3.—Suffolk Agricultural Association.—Meeting at Ipswich. Entries close June 14.
- JULY 21, 22, 23, and 24.—Royal Agricultural Society of England.—Meeting at Salisbury. Entries for implements close May 1; entries for stock, June 1. Secretary, Mr. J. Hudson, Hanover Square, London.
- JULY 2.—Northumberland Agricultural Society.—Meeting at Cornhill. Secretary, Mr. W. Johnson, Gateshead.
- JULY 30.—North Lincolnshire Agricultural Society.—Meeting at Louth. Entries close July 15. Secretary, Mr. J. Hett, Brigg.
- JULY 30.—Ryedale and Pickering Lth Agricultural Society.—Meeting at Helmsley. Entries close July 11. Secretary, Mr. J. H. Phillips, Helmsley, Yorkshire.
- AUGUST 5 and 6.—Yorkshire Agricultural Society.—Meeting at York. Entries close July 22. Secretary, Mr. J. Haonam, Kirk Deighton, Wetherby.
- AUGUST 6 and 7.—The Highland and Agricultural Society of Scotland.—Meeting at Glasgow. Entries close June 18. Secretary, Mr. J. Hall Maxwell, Albany Place, Edinburgh.
- AUGUST 19, 20, and 21.—Royal Agricultural Improvement Society of Ireland.—Meeting at Waterford. Entries close July 25. Secretary, Captain Croker, Upper Sackville Street, Dublin.
- SEPTEMBER 10.—Manchester and Liverpool Agricultural Society.—Meeting at Warrington. Entries close August 29. Secretary, Mr. T. B. Ryder, Elliott Street, Liverpool.
- OCTOBER 2.—Bedfordshire Agricultural Society.—Meeting at Bedford. Secretary, Mr. T. W. Turnley, Bedford.
- DECEMBER 7.—Birmingham Cattle and Poultry Show, at Birmingham (time not yet fixed); but probably the week previous to the Smithfield Club Show.) Secretary, Mr. J. Morgan, junr., Bennett's Hill, Birmingham.
- DECEMBER 8, 9, 10, and 11.—Smithfield Club Cattle Show, at the Horse Street, London. Secretary, Mr. Brandreth Gibbs, Half-Moon Street, Piccadilly, London.
- DECEMBER 7, 8, 9, 10, and 11.—Various Meetings of the Royal Agricultural Society of England, of the Smithfield Club, and of the Farmers' Club, at their several Offices in London.

\* \* \* On the first Monday in every month up to June, and recommencing in November, there is a Discussion Meeting of the Central Farmers' Club, at 39, New Bridge-street, Blackfriars, at half-past five o'clock. On the first Wednesday in every month—excepting January, September, and October—there is a Council Meeting, confined to Members of Council and Governors of the Royal Agricultural Society, in Hanover-square, at twelve o'clock; and on every other Wednesday an open Meeting for all Members of the Society, at twelve o'clock. On the first Wednesday Evening in April, May, June, and July, at eight o'clock, a Lecture, by either Professor Way or Simmonds, at the Society's House, in Hanover-square.

## REVIEW OF THE CORN TRADE. DURING THE PAST MONTH.

The course of the weather in March has been variable, commencing unusually mild and closing with some occasional severity, and on the whole being deficient in the amount of sharp dry breezes, though the fall of snow and rain has been light. But slight impediments, therefore, have been found to ploughing and field operations; and the sowing of spring corn has proceeded favourably, it being completed in many southern and eastern districts, with the exception of barley. The young wheat has passed through the winter well, being little injured by the fluctuations experienced, there being a very even plant on the ground, with very few gaps in the rows, and the over-luxuriant pieces having received a timely check by the frosts. The anticipated improvement in the samples has not been realized, the mild and damp atmosphere having prevented it, but a slight amelioration is everywhere admitted; and the fact that, with constantly dull reports, the general averages are only slightly reduced, and those for London have improved, is sufficiently convincing on this point. The show of English wheat in the country has been liberal, and the sales beyond those of last year at the same period, while foreign supplies have been on a limited scale; but the granaries remain well stored, from the previous early shipments from America, so that millers have found no difficulty in manufacturing flour of first-rate quality. Fine English wheat in the course of the month has receded in value about 1s. to 2s. per quarter, but secondary and inferior sorts have declined about 4s. per quarter, with a very dragging sale. The stocks in the country hold out well, and there are no indications of exhaustion in any localities, but with from four to five months yet to provide for, before the new harvest is gathered, it would forebode danger to have any appearance of scarcity at so early a period. The opening of the Baltic shortly may bring considerable supplies; but as the stock of old wheat there is exhausted, and the new is held at prices too high to meet present rates in England, it does not seem probable that the importation thence will be very large. Stores in the Black Sea are also too high-priced. The Mediterranean has wants of its own. Spain and Portugal, though less in need, must still be supplied till harvest, though the rapid growth of esculents in those countries will reduce the demand for corn. The American markets remain too high to expect much thence at present prices, while their stocks remain

low in shipping ports: but the breaking up of frost, and the reopening of the canals, are likely to cause a large influx of arrivals, much beyond local consumption; and should orders fail from this side, which they must do, unless at lower rates, shippers there are very likely to make consignments freely to this country. Potatoes have kept much better than they once promised, and their comparative abundance has helped to keep down the price of corn; so that we see no prospect, for the present, of any advance in prices; but one thing is certain, that it will require a good and a great crop, over all the world, to put the stack-yards or granaries well in stock to meet the claims of its growing millions. As respects foreign prices, the most recent advices give the following: At Madrid, sales were still making in retail at 90s. to 100s. per qr.; and at Lisbon, 72s. to 87s. per qr. At Paris, the best new native wheat was 66s. per qr. At Rotterdam, white Zealand prime wheat, 60lbs. per bushel, brought 62s. per qr.; Upper Rhine red, 62lbs. per bushel, being the same price. Hambro' quotes red Saale at 57s. per qr. Red at Rostock was worth 50s. per qr.; at Stettin, 51s. per qr.; Stockholm still quotes 70s. per qr. At Danzig a local trade kept prices high, and till the arrivals of the Upper Polish and Bug wheat came to hand, no profitable shipments were likely to be made, 63s. being quoted for fine quality. Petersburg prices for Cubanka were 54s. 2d., for Saxonska 56s. 7d. Soft wheat at Odessa was worth to 51s. 6d., hard to 64s. Quotations at Alexandria for the inferior produce of that country, for delivery in September and October, were 35s. to 35s. 6d. per qr. At New York, red Missouri wheat was quoted 1 dol. 57c. per bush. = 53s. 6d. per qr. English; white, to 1 dol. 70c. per bush. = 58s. per qr. English; white southern, to 1 dol. 76c. per bush. = 60s. per qr. English. The prospects of the growing crops throughout France, Spain, Algeria, and Italy, were good. In the Australian colonies, where full harvest had commenced, a considerable abatement on the expectations was occasioned by the damage of former floods and present violent storms, as well as by rust and the ravages of insects; but it was hoped the acreable increase would meet the void.

The first Monday in London opened on moderate supplies, with but a limited show for the morning from Kent and Essex, the condition of the latter being very inferior; what little fine appeared was

taken off by millers at former rates, but the remainder was scarcely saleable. The want of fine samples rather increased the consumptive demand for good foreign, and picked qualities commanded full terms. The country markets generally, through the week, quoted either former prices or some improvement, but Liverpool was an exception both on Tuesday and Friday, which severally noted a decline of 1d. to 2d. per 70 lbs., making an average abatement of 3d., or 1s. 6d. per qr. The second Monday exhibited rather increased arrivals, the home-grown and foreign being equal, with a small show again from the near counties in poor condition; this day, therefore, remained without improvement, the market being a mere repetition of the previous week. The country advices following, lost the previous buoyancy, and generally came dull, Liverpool continuing the downward movement to the extent of 2d. to 3d. per bushel, and on Friday 2d. less was quoted, making another decline of about 2s. 3d. per qr. in quotations. The third Monday was also moderately supplied; but there was a visible improvement in the condition of the Kentish and Essex samples; the trade, however, ruled in buyers' favour, say to the extent of 1s. per qr., the business in foreign continuing retail. In the country the same feeling prevailed; nearly all the principal places quoted a like reduction, Norwich and Newcastle being 1s. to 2s. down. Liverpool was no exception this time, the Tuesday's market being 3d. per 70 lbs. lower, or another 1s. 6d. per qr. The fourth Monday, though still without the usual average supplies, continued to show an improvement in the condition of the Kentish and Essex wheat; but it was not enough to sustain the market, the best selected qualities being taken somewhat in buyers' favour, and factors would willingly have conceded a reduction of 2s. per qr. generally to clear their stands even of marketable quality, but in vain. No fall was quoted in foreign, the absence of any large demand leaving prices nominally unaltered. The week closed in London very dull, but at unaltered rates; the country generally quoting heavy markets at 1s. per qr. less money.

The supplies in London during the four weeks referred to have been—in native wheat 25,198 qrs.; in foreign, 28,425 qrs., making the weekly supply larger than in February by 6,694 qrs., chiefly occasioned by better supplies from the Mediterranean and India. The general averages commenced at 55s. 10d., and closed at 55s. 6d. in the period, being only 4d. per qr. less. Those of London, at the opening, were 59s. 5d., closing at 61s. 4d., being 2s. 1d. per qr. higher, for which we have accounted in the improved condition of the samples; though, had the past month shown its char-

acteristic dryness, the improvement would most likely have been over 5s. per qr. The shipments from America, from the 1st of January to the 28th of February, to Great Britain, were about 50,000 qrs. The London exports in four weeks have been 12,409 qrs. wheat, and 8,867 sks. flour. The flour trade has been, like that in wheat, excessively dull, with a downward tendency, though with but little actual reduction in value. The beginning of the month found Norfolks quoted 41s., and on the last Monday they were quoted 40s. per sk. American barrels have lessened in value at the same rate; but town-made samples, the quality of which is only kept up by the purchase of the best lots of English and foreign wheat, have remained throughout at 56s. per sk. The choicest American flour being still quoted 8 dols. 50 c. = 35s. per brl., or 50s. per sk., shows there is little margin for such between New York markets and those of London, where useful sorts have been selling at 29s. and 30s. per brl., and fine at 34s. per brl. The English supplies from the country have been much as in February, viz., 17,645 sks. on the average per week; from America supplies have been less abundant, the number of barrels in the four weeks being only 21,976, against 39,897 in February, with 916 sks. of foreign, against 237 last month. The shipments from New York to this country, from the 1st of January to the 28th of February, were 204,851 brls.

Barley through the month has little varied, though supplies have increased; the first Monday found the top quotation of fine malting sorts 49s. per qr., and the fourth Monday quotes the same price—a fluctuation of 1s. first up, and on the last day as much down, being the history of the month. A large quantity of this grain is already sown under very favourable circumstances, as picked samples have neared wheat prices in their value, and but for more liberal arrivals from abroad lately received, higher rates must have been paid, as the limited growth of last year begins to be felt over all the country; and, though the trade has finished heavily, the scarcity both on the continent and here seem likely to keep it at a high price till next crop, the low rates of beans and maize alone acting as a check. Inferior eastern qualities have been greatly neglected; but, on the disappearance of the stouter kinds, must come into freer use. The exports in this kind have been, in four weeks, 5,334 qrs.; the imports into London in the same time in English were 12,058 qrs., in foreign 39,567 qrs., giving a weekly average of about 5,000 qrs. over February.

Oats, like other grain, have been a dull sale through the month. The first and second Mondays were lifeless, without altered quotations; the third was 6d. per qr. cheaper, and the last nearly 1s. per qr. lower, making a decline of about 1s. to 1s. 6d.

per qr. in four weeks on a comparatively low price at the commencement. The early opening of the near ports bringing unexpected supplies has doubtless occasioned this reduction; and, as Ireland has not yet sent much corn, dealers have acted as though liberal stores were in reserve there, which we, however, doubt, as the acreable growth was considerably reduced, and though the quality last year was fine, the quantity has not been well reported. Ultimately, we think this grain must be dearer, as the good crop in Holland can scarcely be thought to make up for Irish deficiencies, and Russian supplies in quantity cannot reach here till late in the season. The receipts in London during the four weeks have been in English qualities 7,436 qrs.; Scotch, 6,049 qrs.; Irish, 11,355 qrs.; foreign, 64,307 qrs. This shows a large increase as compared with last month, but only makes a weekly average of 22,287 qrs., or below the usual receipts of ordinary seasons; and the granaries having lately been well drawn upon, there will not be much stock should there be any falling off in future receipts.

Beans have been liberally furnished, and, though the prices commenced very low, have still shown a downward tendency, as the consequence of a limited demand. The reduction has, however, not exceeded 1s. per qr., and seems unlikely to go further, as, comparing weight with weight, they are already below barley, and in many cases have been used as its substitute, from this cause. The soundness of the English crop has been remarkable, and the new corn being now fit for general use, and comparatively cheaper than the Egyptian sorts they will gradually work off. The circumstance, too, that the last crop of beans in Egypt is a short one, will tend to keep up the value. The exports have been during four weeks 2,656 qrs.

Peas throughout the month have been much neglected, though in very limited supply. Boilers have been nearly passed by, and their prices scarcely exceed those for hog feed, the value of which has been steady. It is too late now to expect a reaction in white or blue sorts, and the grey and maples are not likely to be of less value.

Linsed, with only moderate arrivals, has received a somewhat unexpected check to its advance. The price has not receded, but the demand has become less, and the roots for cattle feed holding out well, cakes, which till of late have commanded high prices and sold well, have become neglected.

A great business has been doing in red clover-seed, prices having risen 5s. per cwt.; but the close of the month found business past its maximum; and the holders of foreign, though the quantity is limited on hand, begin to be desirous of realizing. White seed has been little in demand, and its value

reduced 3s. per cwt. Trefoil has become difficult to sell. Tares have been almost unprecedentedly neglected—a large quantity of the winter kind being sown in autumn, from their then cheapness and the young plants promising well. Foreign spring tares have therefore cheapened, and fair quality small were to be had at 36s., large at 44s. per qr. Canary-seed, though dull, has maintained its price; so have mustard-seed and hemp-seed. The seeds used in confectionary have not varied in their quotations.

CURRENCY PER IMPERIAL MEASURE

	Shillings per Quarter.	
WHEAT, Essex and Kent, white, new...	50 to 60 extra	63 to 68
Ditto, red, .....	49 56	58 60
Norfolk, Linc. and Yorks., red, new...	48 56	58 60
BARLEY, new, malting .....	39 to 42.....	Chevalier.... 44 49
Distilling .....	36 38.....	Grinding..... 30 32
MALT, Essex, Norfolk, and Suffolk.....	68 73	— 78
Kingston, Ware, and town made.....	70 74	— 79
Brown .....	63 64	— —
RYE .....	— —	30 40
OATS, English, feed .....	23 25.....	Potato..... 24 31
Scotch, feed .....	26 29.....	Potato..... 27 32
Irish, feed, white .....	21 23 fine	25 29
Ditto, black .....	20 23	— 24
BEANS, Mazagan, new.....	31 33.....	Ticks, new... 32 35
Harrow .....	34 36.....	Pigeon..... 38 41
PEAS, white boilers .....	39 42..Maple ..	39 40..Grey 37 38
FLOUR, per sack of 280lbs., Town, Households..52s., fine 53 56		
Country .....	40 41.....	Households.. 44 46
Norfolk and Suffolk, ex-ship .....	— —	39 40

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed..72 75 high do.	— 78 extra	— 82
Kongsberg .....	71 75	— 75 — 80
Rostock .....	62 74 fine...	— 76 — 82
American, white .....	62 68 red .....	59 58 63
Pomer., Meckbg., & Uckermrk, red .....	59 73	71 73
Silesian, red .....	64 69 white .....	69 75
Danish and Holstein .....	58 63	61 68
St. Petersburg and Riga .....	52 58 fine	..58 66
Rhine and Belgium .....	— —	— —
Russian, hard .....	56 70	French..... (none)
BARLEY, grinding .....	26 32	Distilling .....
OATS, Dutch, brew, and Polands..23 29	Feed .....	20 24
Danish and Swedish, feed..	24 27	Stralsund... 24 26
Russian .....	— —	22 24
BEANS, Friesland and Holstein .....	— —	37 40
Kongsberg .....	— 37	42 Egyptian ... 35 36
PEAS, feeding .....	— 37	38 fine boilers.. 39 41
INDIAN CORN, white .....	— 36	40 yellow .....
FLOUR, per sack.....	— —	French .....
American, per barrel, sour.....	24 26	sweet .....
	— —	30 33

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Feb. 7, 1857 .....	56 6	45 9	23 0	39 3	39 6	38 10
Feb. 14, 1857 .....	56 5	44 11	23 6	44 4	39 6	39 7
Feb. 21, 1857 .....	55 10	45 4	22 10	37 7	39 8	39 3
Feb. 28, 1857 .....	55 5	45 3	23 8	39 1	38 11	39 5
March 7, 1857 .....	55 4	45 8	22 8	41 8	39 4	39 4
March 14, 1857 .....	55 6	46 1	21 4	39 10	39 4	39 7
Aggregate average .....	55 10	45 6	23 4	40 4	39 5	39 4
Same time last year .....	70 4	36 4	23 10	17 4	41 10	40 6

COMPARATIVE AVERAGES—1857-56.

From last Friday's Gaz.	s. d.	From Gazette of 1856.	s. d.
Wheat.....	109,123 qrs., 55 6	Wheat.....	68,661 qrs., 67 11
Barley.....	55,912 .. 46 1	Barley.....	67,599 .. 36 3
Oats.....	18,676 .. 24 4	Oats.....	20,298 .. 23 2
Rye.....	200 .. 39 10	Rye.....	122 .. 43 2
Beans.....	7,105 .. 39 4	Beans.....	5,157 .. 41 0
Peas.....	1,388 .. 39 7	Peas.....	1,340 .. 40 3

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	Feb. 7.	Feb. 14.	Feb. 21.	Feb. 28.	March 7.	Mar. 14.
56s. 6d.	..	..	..	..	..	..
56s. 5d.	..	..	..	..	..	..
55s. 10d.	..	..	..	..	..	..
55s. 6d.	..	..	..	..	..	..
55s. 5d.	..	..	..	..	..	..
55s. 4d.	..	..	..	..	..	..

MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF FEBRUARY, 1857.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.		Imported from British Possessions out of Europe		Total.
	qrs.	bush.	qrs.	bush.	
Wheat	101894	7	5658	2	107352 3
Barley	42707	1	..	..	42707 7
Oats	319	8 2	..	..	34988 2
Rye	517	5	..	..	547 5
Peas	2225	6	..	..	2225 6
Beans	18693	7	..	..	18698 7
Maize or Indian Corn	38630	3	..	..	38630 3
Buck Wheat	13	0	..	..	13 0
Beer or Bigg	..	..	..	..	..
Total of Corn and rain	239505	7	5658	2	245164 1
Wheat Meal and Flour	155784	1 11	267	14 15	156061 2 25
Barley Meal	1	0 0	..	..	1 0 0
Oat Meal	0	0 26	1	0 0	1 0 26
Rye Meal	..	..	..	..	..
Pea Meal	1	2 0	..	..	1 2 0
Indian Meal	14	3 6	..	..	14 3 6
Buck Wheat Meal	11	0 0	..	..	11 0 0
Total of Meal and Flour	155822	3 15	263	14 14	156691 1 1

QUANTITIES OF CORN IMPORTED INTO LONDON, LIVERPOOL, HULL, NEWCASTLE, BRISTOL, GLOUCESTER, PLYMOUTH, LEITH, GLASGOW, DUNDEE, AND PERTH, IN THE WEEK ENDED MARCH 11.

Cora, Flour, and Meal.	Quantities Imported.		Amount of Duty.	
	Foreign. Qrs.	Colonial. Bush.	Foreign. £ s. d.	Colonial. £ s. d.
Wheat	34686	1 814	1885	0 9 40
Barley	27087	5	1354	8 1
Oats	17346	5	867	6 10
Rye	1190	0	59	10 0
Peas	140	6	7	0 9
Beans	6464	4	323	4 10
Indian Corn	11571	7	578	12 5
Buck Wheat	..	..	..	..
Bere	..	..	..	..
Total	98487	4 814	5075	3 8 40

PRICES OF SEEDS.

BRITISH SEEDS.

CLOVERSEED, red, per cwt.	50s. to 90s.
"    white	56s. to 80s.
TREFOIL, per cwt.	27s. to 35s.
TARES, per bushel	5s. 6d. to 6s. 6d.
HEMPSEED (none)	—s. to —s.
CORIANDEE, per cwt.	20s. to 24s.
CARAWAY, per cwt., new	—s. to 50s., old
CANARY, per qr.	70s. to 72s.
LINSEED, per qr., sowing	—s. to —s., crushing
LINSEED, per qr.	71s. to 73s.
LINSEED CAKES, per ton	£11 0s. to £11 10s.
RAPESEED, per qr., new	86s. to 88s.
RAPE CAKE, per ton	£5 0s. to £5 10s.

FOREIGN SEEDS. &c.

CLOVERSEED, red, French	70s. to 78s.	American	78s. to 80s.
"    white	60s. to 80s.		
TARES, per bushel, new	5s. 0d. to 5s. 6d.		
HEMPSEED, small, per qr.	—s. to 42s.	Do. Dutch	44s.
CORIANDEE, per cwt.	15s. to 20s.		
CARAWAY	42s. to 46s.		
LINSEED, per qr., Baltic	67s. to 70s.	Bombay	70s. to 72s.
LINSEED CAKE, per ton	£11 0s. to £11 10s.		
RAPESEED, Dutch	76s. to 80s.		
RAPE CAKE, per ton	£5 0s. to £5 10s.		

HOP MARKET.

BOROUGH, MONDAY, March 23.—In the absence of any change from last week, our market continues firm with a steady demand for the choicer descriptions of hops, at the currency of last week.

HART & WILSON.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, March 23.—During the past week there have been very few arrivals coastwise, but still more left from former arrivals than the trade required, which has been dull at the following quotations:

York Regents	per ton	90s. to 110s.
Kent and Essex do.	.....	90s. to 120s.
Lincolnshire do.	.....	80s. to 90s.
East Lothian do.	.....	90s. to 120s.
Do. reds.	.....	80s. to 90s.
Perth, Forfar, & Fish. Reg.	.....	70s. to 85s.
Do. reds.	.....	70s. to 75s.
Irish whites	.....	60s. to 70s.
German do.	.....	50s. to 70s.

BOROUGH AND SPITALFIELDS, LONDON, MONDAY, March 23.—The supplies of potatoes on sale here are tolerably good. For most kinds the demand is steady, at about stationary prices. Last week's imports were 255 tons from Rotterdam, and 160 tons from Harlingen.

York Regents	per ton	90s. to 120s.
Kent and Essex ditto	.....	90s. 120s.
Scotch ditto	.....	80s. 100s.
Ditto Cups	.....	80s. 90s.
Middlings	.....	60s. 70s.
Lincolns	.....	80s. 100s.
Blues	.....	80s. 90s.
Dutch	.....	65s. 75s.

COVENT GARDEN MARKET.

LONDON, SATURDAY, MARCH 28.—Forced Strawberries may now be had at moderate prices. Among early Grapes are some from Jersey of fair quality. Some Pineapples have arrived from Sierra Leone; they are, however, much inferior to those which come from the West Indies. French salading, consisting of Endive, Lettuces, and Barbe du Capucin, continues to arrive. Visitors passing through the market during the last month or so must have been struck with the beautiful samples of large white Broccoli, which have been and are still exposed for sale by the crateful. These are furnished from Cornwall weekly by the wagon load, and realize 2s. 6d. per dozen. Inferior samples may be had cheaper. Forced vegetables comprise French Beans, Seakale, Asparagus, and Rhubarb. Cucumbers may also be obtained. Kent Cob Nuts fetch 140s. per 100 lbs.; Barcelona Nuts, 20s. per bushel; New Spanish and Brazils, 18s. do.; and Chestnuts from 14s. to 21s. ditto. The supply of Oranges is limited. Portugal Onions fetch from 2s. to 3s. per dozen. The Potato trade is heavy, except for best samples, which are a little more in demand. Cut flowers consist of Orchids, Chinese Primulas, Cinerarias, Gardenias, Heliotropes, Jonquils, Lily of the Valley, Tulips, Camellias, Geraniums, Violets, Mignonette, Heaths, and Roses.

FRUIT.

Pineapples, per lb.	6 d to 10 s	Pears, per doz.	8 0 to 10 0
Grapes, per lb.	12 0 20 0	Apples, per half sieve.	6 0 8 0
Oranges, per 100	5 0 12 0	Kent Cobs, per 100lbs.	140 0 2 0
Lemons, per dozen	1 0 2 0	Strawberries, per oz.	1 0 2 0

VEGETABLES.

Cabbages, per dozen	1 0 to 1 9	Onions, green, per bush.	2 6 to 4 0
Broccoli, per bunch	1 0 1 6	Artichokes, each	0 6 0 9
B. Sprouts, p. half sieve	2 0 2 6	"    Ditto, per half sieve	1 6 2 6
Asparagus, per bundle	6 0 9 0	Shallots, per lb.	0 6 0 8
Rhubarb, per bundle	0 6 1 3	Garlic, per lb.	0 6 0 8
Seakale per punnet	1 6 3 0	Lettuce, Cos., per score	0 6 0 9
French Beans, per 100	2 0 2 6	Endive, per score	1 6 4 0
Potatoes, new, per ton	60 0 140 0	Ridishes, long, per bun.	0 6 0 9
Do. per bush.	2 0 2 9	Small Salad, per punnet	0 2 0 3
Carrots, per dozen	0 5 0 7	Horseradish, per bundle	1 6 4 0
Turnips, per dozen	2 0 3 0	Salsify, per bundle	1 0 1 2
Spinach, per sieve	2 0 2 6	Scorzonera, per do.	1 0 1 3
Cucumbers, each	2 0 4 0	Mushrooms, per pottle	1 3 1 6
Beet, per dozen	1 0 2 0	Parsley, per bunch	0 6 0 8
Celery, per bundle	0 9 1 9	Marjoram, per bunch	0 2 0 0
Leeks, per bunch	0 1 1 0	Savory, per bunch	0 2 0 0
		Mint, green, per bunch	0 8 1 0

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.:	s. s.	CHEESE, per cwt.:	s. s.
Friesland.....112to118		Cheshire.....64	74
Kiel.....112	120	Cheddar.....74	84
Dorset, new.....120	126	Double Gloucester.....60	70
Carlou.....100	110	HAMS, York 108 112, new 90	100
Waterford.....		Westmoreland.....90	100
Cork.....108	116	Irish.....86	96
Limerick.....90	100	BACON:	
Sligo.....104	114	Wiltshire, dried.....72	78
FRESH, per dozen. lbs. 9d. to 10s. 6d.		Irish, green.....64	70

ENGLISH BUTTER MARKET.

LONDON, MONDAY, March 23.—Since this day week we have had a serious decline in the price of Butter: our quotations are nominal.

Dorset, fine new milk per cwt. 124s. to 126s.

Ditto, middling..... 104s. to 108s.

Fresh ..... per doz. lbs. 12s. to 15s.

GLASGOW.—There were five carts of cheese, and six tons passed the weigh-house. The market was somewhat duller than this day week. 1st class, new, 69s.; 2nd class, 62s.

CHIPPENHAM.—Broad doubles, 60s. to 66s.; cheddar, 65s. to 74s.; thin, 54s. to 60s.; loaves, 63s. to 70s.; skim, 24s. to 32s. per cwt. About 100 tons were pitched, and the whole of the best articles speedily changed hands. The loaf trade was, as at our last market, rather dull.

SALISBURY.—The supply exceeded 200 tons. The demand was animated for half-cowards, at 57s. to 60s., at which prices nearly the whole of that kind soon changed hands; for better sorts the inquiry was not so great; on the whole, prices must be quoted fully 2s. dearer than at the last market—say, Cheddar, 72s. to 78s.; Somerset, 61s. to 70s.; doubles, 60s. to 64s.; half-cowards, 56s. to 60s.; skims, 34s. to 40s.

SIREWSBURY.—Good cheese realized 65s. to 70s., selling readily immediately unloaded. Middle-class lots 60s. to 65s. Skim cheese sold off quickly at 38s. to 45s.

BELFAST, (Friday last).—Butter: Shipping price, 104s. to 120s. per cwt.; firkins and crocks, 11 1/2d. to 12 1/2d. per lb.; Bacon, 60s. to 66s.; Hams, prime, 80s. to 86s., second quality 70s. to 76s.; prime mess Pork, 95s. to 96s. per brl.; Pork, 54s. to 60s.; Beef, 100s. to 120s. per tierce; Irish Lard in bladders, 76s. to 80s.; kegs or firkins, 68s. to 70s. per cwt.

LONDONDERRY, (Thursday last).—Butter rather cheaper; firkins, per lb., first 1s. 0 1/2d. to 1s., seconds 1s., third 1 1/4d., fourth 1 1/8d., fifth 9 3/4d.; butts, fine 1s. 1d. to 1s. 2d., good 1s. to 1s. 1d., middling 1 1/2d. to 1s. Pork, 58s. to 60s. per cwt.

CHICORY.

LONDON, SATURDAY, MARCH 23.—The week's imports are under 50 tons, and the supply of most kinds in the market is very moderate. A fair average business is doing, at our quotations.

ENGLISH, per ton.....£10 10s to £11 0	HAMBURG.....£11 0s to £10 0
HARLINGEN.....10 10	11 0
FLANDERS.....11 0	0 0
	BELGIUM.....11 0
	GUERNSEY.....10 10

HAY MARKETS.

SATURDAY, MARCH 23.—SMITHFIELD.—Both hay and straw sold slowly, at late rates.

CUMBERLAND.—A moderate supply, and a fair demand.

WHITECHAPEL.—Supply moderate, and trade rather dull.

	At per Load of 36 Trusses.			
	SMITHFIELD.	CUMBERLAND.	WHITECHAPEL	
MEADOW HAY.....	50s. to 80s.	52s. to 80s.	50s. to 80s.	
CLOVER.....	70s. 100s.	70s. 100s.	70s. 100s.	
STRAW.....	26s. 30s.	28s. 31s.	26s. 30s.	

OILS.

Olive, Florence, } £1 3 0 to £1 5 0
Half-chests.....
Lucca.....8 0 0
Gallipoli (252 gals) 60 0 0
Spanish.....59 0 0
Linseed (cwt.).....2 0 3
Rape, Pale.....2 14 6
Brown.....2 11 6
Cod (tin).....48 0 0
Seal, Pale.....48 0 0
Do. Brown, Yel. &c 41 0 0
Sperm.....99 0 0
Head Matter.....104 0 0
Southern.....44 0 0
Cocoa-nut (cwt.).....2 9 0
Palm.....2 2 0
RESIN.
Yellow (per cwt.) £0 5 9
Transparent.....0 5 9

British (per cwt.) £0 6 9	0 7 0
Archange.....0 10 6	0 10 0
Stockholm.....0 12 0	0 10 0

TURPENTINE.

Spirits (per cwt.) £1 19 0	2 1 0
In Pouchons.....1 19 0	0 1 0
Rough.....0 10 0	0 10 6

TAR.

American.....£0 13 0	0 18 6
Archange.....0 18 0	0 18 6
Stockholm.....0 18 0	0 18 0

WHALEBONE.

Greenland, full } £350 0 0	0 0 0
size (per ton).....	
South Sea.....325 0	330 0 0

TIMBER.

LONDON, SATURDAY, MARCH 28.—We have no change to notice in the value of any kind of timber this week. The deliveries have been on a full average scale, but the stocks continue very extensive.

Perload—	£ s.	£ s.		£ s.	£ s.
Quebec, red pine.....	3 10	4 10			
Yel. Pine.....	3 10	4 15			
Quebec Oak, White.....	5 0	7 0			
Do. Birch.....	5 0	6 0			
Do. Elm.....	5 0	5 10			
Dantzic Oak.....	5 0	6 0			
Memel Fir.....	3 10	4 10			
Swedish.....	2 17	3 5			
Masts, Queb. Red Pine.....	6 0	9 0			
Do. Yellow Pine.....	5 0	8 0			
Lathwood, Dantzic fir.....	9 10	10 0			
Do. Memel.....	9 0	9 10			
Do. Quebec.....	5 0	5 10			
DEALS, per C. 12 ft. by 3 by 9 in.:					
Quebec W. Spruce.....	16 0	19 0			
Do. Red Pine.....	17 0	26 0			
St. John W. Spruce.....	15 0	18 0			

DEALS, Yel. Pine, per reduced C.:	£ s.	£ s.
Canada, 1st quality, 16	0	16 10
Do. 2nd do., 11	0	11 10
Archange Yellow, 21	0	23 0
Memel.....	15	19 0
Gothenburg Yellow, 14	0	16 0
Do. White.....	11	13 0
Gravel Yellow, 14 ft., 30	0	32 0
Christiana, per C. 12 ft. by 3 by 9 in.:		
Yellow.....	26	30 0
White.....	20	26 0
Deck Plank, Dantzic, per 40 ft. by 3 in.:	1	1 10
Staves, per Standard M.:		
Quebec Paper.....	55	90 0
Do. Punched.....	22	0 13 0
Baltic Crown Pine, 130	0	24 0

LEADENHALL LEATHER MARKET.

LONDON, SATURDAY, March 28.—Our market continues to be only moderately supplied with Leather, and the demand is steady, at very full prices.

CROP HIDES.

ENGLISH.			
lbs.	lbs.	d.	d.
28 to 35.....	12	19	
36 40.....	18	20	
40 45.....	18	21	
46 50.....	18	22	
50 55.....	19	22	
55 60.....	19	22	

BUTTS.

ENGLISH.			
lbs.	lbs.	d.	d.
14 16.....	24	26	
17 20.....	24	26	
21 24.....	24	26	
25 28.....	24	26	
29 32.....	24	26	
33 36.....	24	26	

FOREIGN.

14 16.....	23	25
17 20.....	23	25
21 24.....	23	25
25 28.....	23	25
29 32.....	24	26
33 36.....	24	26
36 45.....	21	26
45 50.....	22	26

OFFAL.

English Shoulders.....	17	21
Do. Cheeks and Faces 10	12	
Do. Bellies.....	11	13 1/2
Do. Middles.....	14	15 1/2
Foreign Shoulders.....	14	16
Do. Necks.....	11	13
Do. Bellies.....	10	12
Do. Middles do.....	13	14 1/2
Dressing Hide Shoulders 13	14 1/2	
Do. do. Bellies.....	10	11
Kip Shoulders.....	5	8
Do. Bellies.....	4 1/2	5

DRESSING HIDES.

Common.....	20 to 24	18 to 19
Do.....	25	28 1/2
Do.....	30	34 1/2
Do.....	35	40 1/2
Saddlers.....	30	35 1/2
Bulls.....	38	50
Shaved.....	14	16
Do.....	17	19
Do.....	20	23
Do.....	24	28
Scotch do.....	16	24
Coach, per Hide.....	35s.	to 40s.

HORSE BUTTS. SHAVED.

English.....	16 to 18	17 to 19
Spanish.....	16	17 1/2

HORSE HIDES.

English.....	13 to 18	14 to 16
Do. without butts 9	14	13 1/2
Spanish salted, without butts, per hide, s.d. s.d.	6	9 1/2 to 17 6
Do. do. do. 9	11	14 to 20 0
Do. dry do. inferior.	9	10 12 0
Do. dry do. 6	8	10 16 0
Do. do. do. 9	11	12 to 18 0
Do. do. do. inferior.	8	10 11 0

CALF SKINS.

Av. weight. Unrounded. Rounded.	lbs.	lbs.	d.	d.
Do. without butts 9	20 to 28	20 to 24	24 to 32	
30	35	21	26	24 31
35	40	21	27	25 32
40	45	22	27	25 33
45	50	22	27	25 33
50	55	22	26	24 32
55	60	21	25	24 31
60	70	20	24	24 30
70	80	19	23	22 28
80	90	18	22	22 27
90	100	18	21	21 26
100	120	17	20	20 24

KIPS.

Petersburgh.....	4 to 7	21 to 25
Do.....	7	9
Do.....	9	10
Do.....	11	13
E. Ind. dry salted 5	7	23 25
Do. do. 7	9	22 24
Do. seconds.....		20 22
Do. thirds.....		17 19
Do. inferior.....		13 15

SUNDRIES.

Hog Skins, best.....	each	12 to 20
Do. seconds.....		8 12
Seal Skins, split, per doz.		64 89
Do. for bindings.....		40 81
Calf Skins, Sumach, tanned.....		50 60
Do. white.....		50 45
Horse Hides, white, each.....		8 14
Sheep Skins.....	d. d.	
Basils, unstrained, per lb. 9	15 1/2	
Do. strained.....		9 16
Do. facing, per doz.....		58. 186
Tan, Sheep, per Lamb.....		10 22
White Sheep, per 120.....		80 110
Do. Lambs.....		60 110
Do. Sheep & Lambs, strained, per doz.....		7 18
Surchin, per doz.....		20 38
Do. Skivers.....		10 16
Bark Skivers.....		9 16
Hide Splits, per lb.....		9 to 11

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, MARCH 28.

MARKE HIDES, s. d. s. d.			
66 to 68 lbs. per lb. 0	53	0	53
64 to 72 lbs. do.....	53	0	53
72 to 80 lbs. do.....	6	0	63
80 to 88 lbs. do.....	6	0	63
88 to 96 lbs. do.....	7	0	74
96 to 104 lbs. do.....	7	0	74
104 to 112 lbs. do.....	0	0	0

HORSE HIDES, each 10	s. d.	s. d.
CALF SKINS, light, 3	0	0
Do. full.....	9	6
SHEEP, Polled.....	10	0
Kents and Half-breds, 8	0	0
Downs.....	6	3
Shearings.....	1	4

BIRMINGHAM, SATURDAY, MARCH 28.

HIDES.		Per lb.		CALF.		Per lb.	
s.	d.	s.	d.	s.	d.	s.	d.
95lbs. and upwards	0 0	0 63	17lbs. and upwards	0 10	0 0	0 0	0 0
85lbs. to 94lbs.	0 0	0 67	12lbs. to 16lbs.	0 9	0 0	0 0	0 0
75lbs. to 84lbs.	0 0	0 63	9lbs. to 11lbs.	0 8	0 0	0 0	0 0
65lbs. to 74lbs.	0 63	0 64	Light	0 7	0 0	0 0	0 0
55lbs. to 64lbs.	0 0	0 64	Flawed and irregular	0 7	0 0	0 0	0 0
55lbs. and under	0 0	0 64					
Cows	0 54	0 53	WOOLSKINS	11 9	7 6	0 0	0 0
Flawed and irregular	0 58	0 53	PELTS	0 10	0 1	0 4	0 4
Horse each	0 0	0 0					
Bulls	0 0	0 4	FAT Mut. & beef, mixed, 43d. to 53d.				

BAMFORD BROTHERS, Brokers.

BARK, &c.

LONDON, SATURDAY, MARCH 28.

English, per load of 45 cwt., del. in London		£ s.	£ s.	Cork Tree, Barbary		£ s.	£ s.
13	10cwt	15	10	7	0	7	10
Coppice	14	0	16	0	7	0	7
Dutch, per ton	5	0	5	0	16	0	16
Hambro	4	10	5	5	11	0	13
Antwerp Tree	5	0	6	0	17	0	17
Do. Coppice	6	0	6	10	50	0	52
French	0	0	0	0	10	0	11
Mimosa	8	10	10	10	8	0	13
Do. Ground	10	10	10	0	13	0	15

FLAX, HEMP, COIR, &c.

LONDON, SATURDAY, March 28.—We have had a moderate inquiry for Flax, at about stationary prices. Most kinds of Hemp support previous rates. Petersburg clean £35 10s. to £36, outshot £33 to £34, and half-clean £30 to £31 per ton. Jute is fully 10s. per ton dearer than last week. Coir goods are steady.

MANURES.

LONDON, MONDAY, March 23.—The imports of Peruvian guano into London last week were 2,480 tons, and 140 tons exported. There is no alteration to notice in the market for artificial manures this week.

Linseed-cakes have been sold freely at a slight decline.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO, (per ton, for 30 tons) nominal	£13 5	0	to	£0 0	0
Do.	14	15	0	15	0
BOLIVIAN GUANO	12	0	to	12	10

ARTIFICIAL MANURES, &c.

Nitrate Soda (per ton)	£19 10	0	to	£20 0	0
Nitrate Potash or Saltpetre	29	0	to	30	0
Sulph. Ammonia	18	0	to	18	0
Muriate ditto	22	0	to	23	0
Superphosph. of Lime	6	0	to	0	0
Soda Ash, or Alkali	0	0	to	8	0
Gypsum	2	0	to	2	10
Coprolite	3	15	to	4	0
Sulph. of Copper or Roman Vitriol, for Wheat steeping	42	0	to	43	0
Salt	1	5	to	2	0
Bones, Dust, per qr.	1	5	to	1	6
Do. ½-inch	1	4	to	1	5
Oil Vitriol, concentrated, per lb.	0	0	to	0	1
Do. Brown	0	0	to	0	0

OIL-CAKES.

Linseed-cakes, per ton—	Marseilles	£9 0	0	to	£9 15	0
Thin American, in brls. or bags	English	10	10	to	11	0
Thick do. round	Rape-cakes, pr ton	6	5	to	6	10

JOHN KEEN, 35, Leadenhall-street, (Late Odams, Pickford, and Keen.)

Williams & Co., 24, Mark Lane—Azotic..... £6 10 0

Manufactured by Hodgson & Simpson, Wakefield, and Matthews & Co., Driffield.

Ammonia-Phosphate and Nitro-Phosphate..... per ton £8 0 0  
Superphosphate of Lime ..... ,, 7 0 0

Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops..... per ton £8 10 0  
Prentice's Turnip Manure ..... ,, 7 0 0  
Prentice's Superphosphate of Lime ..... ,, 6 10 0

Lancashire Manure Company, Widnes, near Warrington.

J. Knight & Co.'s Nitrogenized Bone Manures..... per ton £8 15 0

Manure Works, Grovehill, Beverley.

Tigar & Co.'s Celebrated Turnip Manures..... per ton £7 10 0

WOOL MARKETS.

BRITISH WOOL MARKET.

MONDAY, March 23.—Our market, under the influence of a tight money market, has become heavy, and some forced sales of skin combing have been made at a reduction in price of fully 1d. per lb. In the value of other wools we have no

change to notice, and demand is very inactive. Holders, however, are firm in their demands.

Per pack of 240lbs.

Fleeces—Southdown Hogs	£21 10	to	£22 0
Do. Half-bred Hogs	19 10	to	20 10
Do. Keut	17 10	to	18 0
Do. Southdown Ewes and Wethers	18 0	to	19 0
Do. Leicester do.	17 0	to	18 0
Sorts—Clothing, picklock	22 0	to	23 10
Do. Prime and picklock	20 10	to	21 0
Do. Choice	18 0	to	19 0
Do. Super	17 0	to	18 0
Do. Combing—Wether matching	23 0	to	24 0
Do. Picklock	19 10	to	20 0
Do. Common	16 0	to	17 0
Do. Hog matching	24 10	to	25 0
Do. Picklock matching	20 10	to	21 10
Do. Super do.	17 10	to	18 10

LEEDS WOOL MARKET, March 20th.—There has not been any change of moment in this branch of trade this last week. Sales of combing wools have been flat, the manufacturers (who are all working full time) continuing to use from their recent purchases. Prices are firm, but in actual sales are a turn in favour of the buyers. Down clothing sorts are in steady demand, and have ready sale at last week's rates.

LIVERPOOL WOOL MARKET, MARCH 21.

SCOTCH WOOL.—The demand for Laid Highland is only fair; the manufacturers only buy for their immediate wants, but stocks were never known to be so light at this period of the year. White Highland is scarce and inquired for. Cheviot and crossed of a good class are still in moderate request at rates rather in favour of the buyer.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs.	16	0	17	0
White Highland do.	18	6	20	0
Laid Crossed do., unwashed	18	0	20	6
Do. do., washed	20	0	31	6
Laid Cheviot do., unwashed	23	0	22	6
Do. do., washed	23	6	28	0
White Cheviot do., washed	32	0	40	0

FOREIGN WOOL.—The London sales having closed with less spirit, and for fine wool at some reduction, has to a certain extent had an influence on our market. Low wools being light in stock, and no immediate prospect of fresh supplies, are less affected, and late rates are fully supported. The alteration in the American tariff will considerably influence all low wools.

Imports for the week ..... 7,987 bales.  
Previously this year ..... 30,529

FOREIGN WOOL MARKET.

	Per lb.	Duty Free.	s.	d.	s.	d.
German, (1st and 2nd Elect	3	4	to	4	6	
Saxon, (Prima	2	4	to	3	0	
and Secunda	2	0	to	2	4	
Prussian, (Tertia	1	8	to	1	10	
Australian & V.D. Land—Combg. & Clothg	1	4	to	3	2	
Do. Lambs	1	8	to	2	2	
Do. Locks and Pieces	0	10	to	2	1	
Do. Grease	0	10	to	1	3	
Do. Skin and Slippe	1	4	to	2	1	
S. Australian & S. River—Combg. & Clothg	1	6	to	2	6	
Do. Lambs	1	6	to	2	2	
Do. Locks and Pieces	1	1	to	1	7	
Do. Grease	0	7	to	1	4	
Do. Skin and Slippe	1	8	to	2	2	
Cape—Average Flocks	1	0	to	2	2	
Do. Combing and Clothing	1	1	to	2	1	
Do. Lambs	1	4	to	2	1	
Do. Locks and Pieces	1	3	to	1	10	
Do. Grease	0	8	to	1	5	

LEEDS FOREIGN WOOL MARKET, March 20th.—The supply of wool from the sales is now rapidly coming to hand, and though it is not moving off in large quantities into consumption, there seems to be little doubt that the comparatively light stock will be barely sufficient to meet the demand, with the probability of a fair spring trade. Prices are not materially altered.







Wm. H. Lambton.





1851  
The following is a list of the names of the cows which were exhibited at the Great Exhibition of 1851, and of the breeders to whom they were sent. The names of the breeders are given in full, and the names of the cows in italics. The names of the cows are given in full, and the names of the breeders in italics. The names of the cows are given in full, and the names of the breeders in italics.

# THE FARMER'S MAGAZINE.

MAY, 1857.

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## PLATE I.

PORTRAIT OF THE LATE MR. HENRY CHAMBERLAIN.

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## PLATE II.

GRAND TURK; A ROAN BULL.

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## THE LATE MR. HENRY CHAMBERLAIN.

To select men of any class as examples to their fellows requires great care and discrimination, as our aim should be only to pay honour where honour is justly due; and to hold up the characters of those whose consistent conduct through a long life supplies a moral and an example which all may do well to follow. In carrying out this principle, we are induced to point to men whose private acts, which are often known only in their own parish or neighbourhood, are more highly valued than even those which gain the admiration and applause of the many. This may be truly recorded of the late Mr. Henry Chamberlain, of Desford, near Leicester, who had for a lengthened period been an eminent member of the agricultural community. The position which he reached and long occupied cannot be obtained by one lucky hit or brilliant thought, but only by a long course of useful conduct directed by the soundest discretion and highest principle. His success as a breeder and feeder of stock has been of no common order. In the numbers of this Magazine for May, 1839, and May, 1840, will be found some account of Mr. Chamberlain's prizes as then gained, with portraits of his animals. In one

year he took five premiums at the Smithfield Club Show, amounting to £70, besides three silver medals and one gold medal. At the Leicester Show, which has been considered the best local exhibition in the kingdom, he took thirteen prizes in one year. In giving an account of his stock, it was then stated that "no observations which we could make would prove the celebrity of Mr. Chamberlain, as a breeder, so conclusively as these facts." In short, he carried away so many prizes that his table became loaded with these honours, in the shape of silver tankards and cups, gold and silver medals, in addition to some hundreds of pounds received in money. It is a matter of comparative ease for a gentleman to purchase first-rate animals, and then win with them; but the great merit in Mr. Chamberlain's case was the fact that *he was the breeder of all his prize animals*. The following remarks on his character as a breeder are from an excellent notice which appeared, immediately on his decease, in the *Leicester Journal*:—"He was pre-eminent in his herd of Hereford beasts, and perhaps no breeder out of that and the adjoining counties ever attained such excellence in this breed of stock: certainly no one

in the midland counties could compete with him with any chance of success. He introduced the Herefords into Leicestershire about thirty years since, and by a judicious selection of stock from the best herds in that county, and by great care and judgment in breeding, he succeeded in producing animals equal to any which it possessed. It will be recollected that some years back he exhibited many Herefords at the Smithfield Show, and carried away prizes when competing with animals sent from their native county by the most celebrated breeders. Not only was he famed for his breed of beast, but his flock of New Leicester sheep were in high repute, and they also took several premiums at Smithfield. He selected his sheep from those flocks which ranked high as retaining the pure Dishley blood; and, though not an extensive breeder of rams, he always had some to let in each season, which did him great credit, and were anxiously sought after by those who knew his flock. The excellent animals which he exhibited for many years gave a character of celebrity to the Leicestershire Society, which was a great cause of its subsequent success; for in its early years the show would have been but a sorry affair had his stock been absent, and, in all probability, would not have arrived at that degree of excellence which it has since attained. For several years he was the *most* successful candidate, and carried off so many of the prizes that his *buffet* became loaded with silver, in the shape of cups and tankards, which he won on those occasions."

Mr. Chamberlain was an active member of the Smithfield Club, and so lately as last December took a leading part in its proceedings, when he was the cause of about £350 being added to the prize sheet for this year—to be appropriated in increasing the number of prizes, and making new classes for the Sussex, Long-horn, Norfolk, Scotch, and Irish breeds. He also, in connection with other gentlemen, assisted Lord Berners in forming the Leicestershire Agricultural Society, of which he continued an active member to the time of his death. Mr. Chamberlain was one of the chief founders of another most useful society, that has risen to great eminence and been productive of much good—the Sparkenhoe Farmers' Club, which was originated by a few farmers in the neighbourhood of Desford, and over the interests of which Mr. Chamberlain was often called upon to preside. His services as one of the judges at the meetings of the Royal Agricultural Society were often solicited, as well as at Birmingham, and many other places throughout the kingdom. There was, too, another public capacity which Mr. Chamberlain

filled for twenty-one years, to his own credit and the entire satisfaction of his colleagues, and that was the vice-chair of the Market Bosworth board of guardians. The Earl Howe was chairman the whole of that time, and always acted with Mr. Chamberlain in the most cordial manner, jointly administering the law with as much kindness towards the poor as was consistent with their duty towards the ratepayers. Mr. Chamberlain was on his way to attend a meeting of this board, when it pleased Providence to visit him with a sudden illness of so severe a nature that in two days he quietly yielded his spirit to him who gave it, to the deep and sincere regret of all his friends, in the 66th year of his age. His knowledge of the Poor Law was of no common order, and his great application to this business for so many years eminently qualified him to take a leading part in matters of this kind.

Mr. Chamberlain farmed his own estate of about 650 acres of land, and he ranked amongst the highest in the class of "substantial, honourable, and hospitable Old English yeomen." He was a compeer in agricultural improvement with such men as Jonas Webb, Charles Hillyard, Messrs. Gibbs, Thomas Chapman, Thomas Umbers, Charles Stokes, &c.; and he also enjoyed the esteem and friendship of noblemen and gentlemen in various parts of the kingdom, including the Duke of Richmond, the Earl Howe, the late Earl Spencer, Lord Berners, and others. Whether we view the character of the late Henry Chamberlain in a public or private capacity, we cannot but come to the conclusion that he had been a most useful man in his day, and done much good in his generation. May his excellent example and consistent conduct through life, whether as a public man or a private gentleman, be emulated by the very many who have met him, or at least have been familiar with his name and successes.

It was only at the last show of the Midland Counties Society, at Birmingham, that we met Mr. Chamberlain busy on his round of inspection; and it is only within these few weeks that the members of that Society have publicly testified to his worth. At a meeting held at Birmingham on the 15th of March, the following resolution was entered:—"That this meeting desires to record the deep sense which they entertain of the loss experienced by the Society and by the agricultural community generally in the lamented death of Mr. Henry Chamberlain, of Desford, who had been a member of this council for the last three years, and who had also from the first institution of the Birmingham Cattle Shows constantly afforded most valuable advice and assistance in their management."

## GRAND TURK,

LATE THE PROPERTY OF HENRY AMBLER, ESQ., OF WATKINSON HALL, HALIFAX, YORKSHIRE.

GRAND TURK, a roan bull (12969), bred by Mr. S. E. Bolden, of Springfield Hall, Lancaster, and calved Dec. 13th, 1852, is by Grand Duke (10284), dam (Young Rachel) by Leonard (4210), g. d. (Rachel) by Young Red Rover (4905), gr. g. d. (Rally) by Rowton (5019), gr. gr. g. d. (Young Carnation) by Admiral (5), gr. gr. g. d. (Carnation) by Pilot (496), gr. gr. gr. g. d. (White Rose) by Albion (14), gr. gr. gr. gr. g. d. (Halnaby) by The Lame Bull (359), gr. gr. gr. gr. g. d. by Easby (232), gr. gr. gr. gr. g. d. by Suworrow (636).

At the Carlisle Meeting of the Royal Agricultural Society of England, in 1855, Grand Turk, then only two-years-and-a-half old, was *highly commended* in the All-aged class—Mr. Booth's Windsor taking the first premium, and Lord Feversham's Gloucester the second.

In April, 1856, Grand Turk took the second premium at the Spring Show of the Royal Dublin Society.

In July he took the second prize of £15, at the Chelmsford Meeting of the Royal Agricultural Society of England; Mr. Towneley's Master Butterfly receiving the first.

In August, at the Rotherham Meeting of the Yorkshire Society, he took the first prize of £25, again beating Gloucester; only highly commended at Chelmsford, and here receiving the second premium.

In the same month at the Athlone Meeting of the Royal Agricultural Improvement Society of Ireland, he took the first prize of £20, and the

gold medal, as the best Bull in the yard, beating Lord Clancarty's Pro Bono Publico, which at the Spring Show at Dublin took the gold medal against Grand Turk.

In September he took the first prize of £5 and the medal, as the best Bull, at the Preston Meeting of the North Lancashire Society.

He also took the first prize at the meeting of the Durham Agricultural Society.

Grand Turk is a noble animal, uniting size and quality in a very remarkable degree. He is beautifully proportioned, and his general frame denotes great substance. His girth is 8 feet 11 inches, and round his flank 9 feet 6 inches; his length from horn to tail 8 feet 5 inches, and his height in full keeping. His head is very fine; his neck, perhaps, a little too thin, but with a deep, full, and prominent bosom. His shoulders are full, well out, long and deep; and, as we have already stated, he has great depth of girth. His ribs though very long are scarcely rotund enough, nor is his back quite level. He has a broad loin; very long full fat rump; good hips, well covered; deep thighs; a deep, somewhat hanging, heavy flank; tuts good, with tail hanging well between them; twist full, and offal fine. He is in colour a good roan; stands and shows very well, and is, in short, a magnificent specimen of the Improved Shorthorn.

At the sale of Mr. Ambler's herd, on the 1st April, Grand Turk was bought by Mr. Strafford for Mr. Thorne, of New York, at 300 gs. A report of the sale will be found at page 438, in the present number.

## THE FREE ACCESS OF AIR TO THE SOIL.

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

At a season when so many of my readers are employed in draining operations, it will be useful to refresh our memories with the suggestions of the chemist; and it may not be without its use, if at the same time we recur to some of the great objects in this way to which the men of the past generation of farmers had their attention directed. Many of the efforts, indeed, of the great agriculturists who flourished at the close of the last century (attempts in which they failed, chiefly for want of

science to aid them) might be renewed now with a much better chance of success than in their days. I have on a recent occasion glanced at the unsuccessful endeavours of Arthur Young to apply mineral acids as a manure, and we have seen how very near he was to the discovery of superphosphate of lime, and I will now show how he laboured to apply various gases, or airs, as he called them, to the roots of plants. Young evidently had the sagacity to perceive that if the atmospheric air

could be applied into and under the soil in which the growing plant was placed, very beneficial results would arise; he had noted the effect of the atmosphere in places where plants were placed over dry drains, and in other situations the most exposed to the breezes, and he began therefore a series of experiments in June, 1782, upon the fertilizing effect of various gases applied to the roots of plants. Arthur Young, in reporting the results, frequently speaks of "phlogiston," which it may be well to remind the reader was an imaginary substance, conjured up by the chemical philosophers of that day, which they deemed to be the essence of the food of plants, and who thus regarded it useful to explain unknown things by giving names to imaginary substances. The detail of Young is entitled, "Some attempts to apply Air as a Manure to the Soil" (*Annals of Agriculture*, Vol. i., p. 169). In this, after telling us truly enough, "It has never been my conduct to abandon to speculation that which can be brought to the test of experiment," he describes his experiments with some barley planted in pots, and subjected to the action of carbonic acid gas, hydrogen gas, and common air; and he adds (*ib.*, p. 185), "Had not inflammable air been tried, the leading feature for selection would have been the effect of the volatile alkali (ammonia) which is universally excellent; and as putrefaction is known in common practice to yield admirable manure, it might have been concluded with great propriety, that the volatile alkali is the food of plants, a theory for several years the favourite deduction of my practice." And in another place he remarks—70 years before covered homesteads were advocated—(*ib.*, p. 187) "I have a standing sheepfold, part covered and closed, and part of it uncovered; and the whole is littered equally, but one load of the dung in the covered part is worth two in that uncovered. When the carts go in to be loaded, it stinks much more offensively, and makes the men's eyes water that move it. This shows that the volatile alkali and phlogiston are retained, and that the action of the sun and atmosphere is to carry them off." It is curious to read these sagacious remarks, and to think of Lawes and Liebig three-quarters of a century afterwards discussing the claims of ammonia to the position to which it was elevated by poor Arthur Young. "No day passes," he sorrowfully concludes, "without my regretting my insufficient ability to pursue the hints which arise. Time is precious: life flies fast away, and leaves one little more than wishes to execute what fortune forbids."

These attempts to apply air to the soil long ceased after the days of Young. Then arose the drill husbandry, and the beneficial horse-hoeing stirrings of Holkham. The air, it was soon found, did good.

It was then remembered that the atmosphere was charged with insensible moisture; it was long afterwards shown, that this vapoury portion was not pure water—that it held ammonia and nitric acid in solution; and attempts have even been made to promote the free access of these watery vapours to the soil, by means not only of deep stirrings of the soil, but by causing a flow of air through the common land-drains. It would be useful if such trials were extended; and it would assuredly be attended with an increase of our knowledge, if some small trials were instituted upon the effect of passing a gentle steadily-continued current of air through the soil in which plants were growing. This would be valuable, not perhaps as being in this way generally applicable to our fields, but as showing by the results whether more extended and more practical applications might not be desirable. If the reader will refer to the ninth volume of the *Journal of the Royal Agricultural Society*, he will find (p. 340) some striking examples of the good effect produced by facilitating the entrance of air into the land by means of air drains constructed by Mr. S. Hutchinson, of Grantham, in Lincolnshire. Amongst other trials, he describes one in a field consisting of ten acres of strong loamy soil upon a clay subsoil. "It was under-drained in 1843, by twenty-five parallel drains, two feet deep and five yards apart, each discharging into a covered outfall at the bottom of the field. In the autumn of 1846, it occurred to me that this being a shallow-drained field presented a good opportunity for experiment. I divided it into five compartments, each containing five of the drains. With the two outside and centre compartments I did not interfere. In the two other compartments I introduced what I call an air-drain across the *upper end* of the five drains in each case, to join them together. I then connected the air-drain so cut with the adjacent open ditch at the top of the field, in order to increase the natural current or circulation of air through the ordinary drains. In the following table the produce of an acre of both the air-drained and the non-air-drained land is given—

	TURNIPS.		
	Skirving's. Tons. cwt.	Pine-apple. Tons. cwt.	Wheat. Bush.
Air-drained . . . .	16 4 . . . .	10 8 . . . .	28 $\frac{3}{4}$
Non-air-drained . . . .	13 12 . . . .	6 16 . . . .	21

In another experiment—

Air-drained . . . . .	35
Non-air-drained . . . . .	30

In the windy or breezy weather Mr. Hutchinson adds that a draught of air through drains is always perceptible at the outlets; and at other times, after



water has ceased to be discharged, a hazy evaporation is frequently visible. Many incidental circumstances, therefore, tend to confirm the opinion that if by any artificial means we could make the atmospheric air gently filter through the soil, its beneficial influence in promoting the growth of plants would be very considerable.

The good effect indeed of land drainage, which we are too apt to explain entirely by the removal of the stagnant water, should to an equal extent be assigned to the warming and fertilizing effect of the air which diffuses itself through those cavities and pores of the soil previously filled by the water. The results, like those to which I have alluded, have been very well shown in the observations made by Mr. Henry Stephens, and recorded in his work on the Yester Deep Land Culture. To give an instance—Six thermometers were placed in the soil, at a depth of 18 inches. This distance from the surface was chosen, since at that depth they were found not to be sensibly affected by the changes of the temperature of the atmosphere. Observations were made, to ascertain the temperature of the ground before and after it was thoroughly drained and subsoil-ploughed. In the following table column I. gives the month; II., the mean temperature, in 1849, of the soil of a field at Yester Mains in its undrained state; III., that of another field in the same year, after being thoroughly drained; IV., that of No. II. in 1850, after thorough draining; V., that of the soil of the south border of a garden at Yester, in 1849:—

VEGETATING SEASON.

	I.	II.	III.	IV.	V.
March .....		36	37	37	42
April .....		40	38	39	43
May .....		48	47	42	51
June .....		54	53	54	58
July .....		55	54	59	62
August .....		56	46	54	62
September .....		50	54	55	59
October .....		35	37	50	50
Mean of veg-tating season		46.75	45.75	48.75	53.37

NON-VEGETATING SEASON.

	I.	II.	III.	IV.	V.
November .....		34	37	44	46
December .....		34	36	39	41
January .....		32	32	32	43
February .....		34	38	36	53
Mean of non-veg. season		33.5	35.75	37.75	45.75
Mean of both seasons		42.33	42.42	45.08	50.83

The celerity with which thorough draining may affect the temperature of the surface soil was observed in one instance at Broadwoodside. A thermometer placed one foot under the surface, on the crown of an 18-foot ridge, before a drain was

cut, indicated a temperature of 48 deg.; after a drain had been cut to the ordinary depth on each side, in the open furrow of the ridge, the temperature rose to 49.5 deg., that is 1½ deg. in 6 hours (*Agri. Gaz.*, 1855, p. 651).

It would, indeed, be an incorrect conclusion that the cause of the increase of temperature is assignable to the mere removal of the land water, since in well-drained land the temperature at 18 inches keeps pace with that of the atmosphere. In my own observations, the thermometer is placed in thoroughly-drained land, in fact a porous rock sand; and here the thermometer placed at 18 inches from the surface commonly rises and falls with another thermometer placed immediately above it, about five feet from the surface.

The advantages then of a more extended supply of air to the soil do not appear to have any attendant drawbacks. The attraction of the soil for the insensible moisture of the air, and for its ammonia, is so considerable, that no fear need be entertained of its want of power to separate them from the atmospheric gases. The same power which enables the soil to abstract the volatile alkali from rain-water, is exerted in absorbing it from the air with which it comes in contact.

“Every acre of ground,” observes Professor Way, “which allows water to percolate freely, benefits equally by the nitric acid and ammonia of rain. But whence comes the additional luxuriance which vegetation puts on when the land is abundantly worked? whence the Loïs Weedon crops? Obviously Mr. Smith cannot be satisfied with the ammonia of rain, he must have some from the air also; and he gets it from the air in a far greater quantity than the rain could furnish.” “In fact (adds Mr. Hoskyns), he habitually expresses his obligations to the dew, as a more steady benefactor than the rain, in much the same terms as might express the relation of ‘daily bread’ to an occasional feast.”

Any improvement in the drawing nourishment to our lands in this way has a great and paramount advantage; that it is deriving our supplies from an ever present fountain; no river waters are taken—no vested rights are trenchd upon.

Such a retrospective glance at the labours of past agriculturists, and of the illustrations which science has since afforded, will hardly fail of being useful to us in the drainage improvements in which, at this period of the year, most cultivators are engaged. The advances in science, too, which we have been tracing since the time of Arthur Young, and the noble little band of farmers who graced the close of the last century, should cheer us on in the path of improvement. They laboured from enlightened convictions which they were con-

tent to explain by mystic phrases. We, it is true, sometimes rather too closely imitate this amusing example; but then we have the aid of advanced knowledge—the progress of agricultural chemistry, a

science whose first germs were hardly formed when Priestley was experimentalising in his laboratory, and Arthur Young amid the barley soils of his own good honest Suffolk.

## GREAT SPRING CATTLE SHOW OF THE ROYAL DUBLIN SOCIETY.

The Royal Dublin Society and the Royal Agricultural Improvement Society of Ireland are to the Sister Kingdom very much what the Smithfield Club and the Royal Agricultural Society of England are to us on this side of the Channel. They are supported by the same classes, directed very much by the same men, but are still kept entirely distinct in their arrangements and organization. The Dublin show, moreover, like the London Club, is to some extent at least a fat cattle show; while the two national Societies very properly restrict their entries and premiums to breeding animals. It might, perhaps, be advisable, in some respects, that the line between the two should be a little stronger than it is just at present. To accomplish this, however, the Dublin Society would have to change its spring meeting into a winter or Christmas one, when prize beef and fat pigs are more legitimately in season.

But this is a point we should be by no means inclined to press. At present the Dublin Society embraces in its operations both the feeding and breeding of animals. It has long continued to do so with much success; although, of course, a fat beast can only rank second in use and importance to one destined for breeding purposes. The Dublin spring show is consequently, par excellence, but another national display of breeding stock. You find many of the same animals at the metropolis in April as you do in the provinces in August. Only last year one of our best English bulls, "Grand Turk," and one of the best of the Irish, "Pro Bono Publico," had each in his turn the call on these two several occasions. This is all as it should be. As we have already said, we have no desire to press for any alteration, or for any more distinguishing difference between the two exhibitions—the one of fat and the other of breeding animals. It is palpable enough that a change—of time say—might be made with advantage to the former. It would be a question, though, whether this would be commensurately a national advantage. Comparatively speaking, a young country in the art of agriculture, Ireland cannot seize too many opportunities for disseminating the best sorts, so long as such occasions are well supported and appreciated. So far the thing is by no means overdone. Both the spring and autumn anniversaries are well supported, and both more and more by the Irish themselves. The time has come when the Emerald Isle can from her own resources find the material not only for a becoming meeting on her own ground, but even to well maintain her credit elsewhere. She has now herds of Shorthorns that would be but very rarely surpassed either in England or Scotland; famous flocks of Leicester

sheep, and pigs as good as they once were bad. If there are people still who question the real use of these agricultural associations, they have only to turn to such examples as these. We believe that much of the improvement that has already been accomplished in Ireland, with the yet more good seed that is now taking root, may be traced directly to the influence of these two associations. Landowners, compelled as it were in the first instance to attend and support such gatherings as a matter of duty, have gradually warmed to them; while a spirit of emulation has been diffused amongst the agriculturists themselves that is perhaps only still in the germ of its intent and effect. The same man, whose aim and pride a few years since would have been to breed a winner of the Angleseas, or to be first home for the Farmers' Cup, has now as strong a feeling to be "famous" for a short-horn heifer, or a long-wooled ram.

Although not so far as generally distributed as they will be, it is remarkable and encouraging to see how strong a hold Ireland has gradually obtained on some of our best sorts of stock. For the Shorthorn, more particularly, she is especially formidable; while such good judges as Mr. Torr have over and over again borne testimony to the excellence of her Leicesters. In the whole of our rounds last year, we were nowhere more impressed with "the character" of the Shorthorn, the best points best developed, than we were with what we saw at Athlone. Nearly all the first animals, too, at this Dublin Spring Meeting, the best bulls and best cows, Mr. Owen's, Mr. Barcroft's, Mr. Turner's, Mr. Campion's, and Lord Clancarty's, were shorthorns. Their quality may be estimated by the very capital prices they brought, particularly from the agents of our American and Australian friends, who were ready buyers. Indeed the sort have succeeded so well here, that breeders have at length, with the aid of the *Irish Farmers' Gazette*, established a sort of "Shorthorn Herd Book" of their own, with quarterly returns from the length and breadth of the land.

If we are to judge from the entries and the names of the exhibitors, this year's show was very successful. This, of course, is the first and best test. As a popular gathering, however, the weather was against it. During the whole of the first day it rained, as it will rain occasionally in those parts, and the company was consequently very select. The list included his Excellency the Lord Lieutenant, who may be supposed to take something more than a merely ex-officio interest in such matters. Lord Carlisle is himself a successful breeder of stock, and we

have heard him as eloquent as a private gentleman at an agricultural meeting in England, as we ever have during his supremacy in Ireland.

The chief feature in the after-proceedings on this occasion was a paper read by Mr. Foot, on the Paris International Cattle Show of last year. This is embodied in our report; and from it the reader will observe the good position maintained by the Irish exhibitors at an unusually strong meeting. In simple fact there is no stronger proof of her "regeneration" than can be deduced from the interest the sister kingdom is now evincing in the art of agriculture. When she does full justice to her own soil and capabilities, then we take it is she interpreting as best she could the rallying cry of "Justice to Ireland."

This Spring Exhibition of stock and agricultural implements took place on Wednesday, April 22, on the premises adjoining the Society's House, Kildare-street, Dublin. Its success was considerably marred by the rain, which continued throughout the whole day.

As regards the quality of the show itself, it is extremely creditable, and in some departments, particularly the cattle, the reputation which the Society has hitherto obtained is fully maintained.

#### LIST OF PRIZES.

##### BREEDING STOCK.

JUDGES: — Scorer, T. Trotter, J. Wright. Steward—R. Collina, M.D.

##### SHORT-HORN BULLS.

Best, calved in 1856, five sovereigns, T. L. Norman, Ardce. Second best, three sovs., Richard Chalmer, Moynalty. Third, large silver medal, Jonathan Richardson, Lisburn.

Best, calved in 1855, five sovs., Thomas Ball, Malahide. Second best, three sovs., Lord Talbot de Malahide.

Best, calved in 1854, five sovs., C. P. Leslie, M.P. Second best, two sovs., Ambrose Bole, Tashinny.

##### SHORT-HORN COWS AND HEIFERS.

Best heifer, calved in 1856, large silver medal, Jaffray Barcroft, Cabintcey. Second best, small silver medal, Thomas Barnes, Moynalty.

Best heifer, calved in 1855, in calf, or producing a live calf within twelve months subsequent to date of show, large silver medal, Earl of Clancarty. Second best, small silver medal, John J. Turner, Kilcullen.

Best Heifer, calved in 1854, giving milk, or in calf, large silver medal, Viscount Monck. Second best, small silver medal, John J. Turner.

Best Cow, of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, Rowland Campion, Shanballymore. Second best, small silver medal, Mrs. William Garrett, Moynalty.

##### DEVON BULLS.

Best, calved in 1856, three sovs., Earl of Charlemont.

Best, calved in 1855, three sovs., Earl of Charlemont.

Best, calved in 1854, three sovs., Wm. Coppinger, Carrigtwohill.

##### DEVONS.

Best heifer, calved in 1855, in calf, or producing a live calf within twelve months subsequent to the date of show, large silver medal, Earl of Charlemont.

Best heifer, calved in 1854, giving milk, or in calf, large silver medal, Earl of Charlemont.

Best cow of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, Wm. Walsh, Balbriggan.

Best Ayrshire Bull, large silver medal, Hon. Thomas Preston.

Best Alderney Bull, large silver medal, Colonel Hill, Castleknock.

Best Kerry Bull, large silver medal, Wm. Owen, Blesington.

Best Bull, of any breed, calved prior to 1854, large silver medal, Earl of Charlemont; highly commended, Wm. Owen, Blesington. Second best, large silver medal, Earl of Clancarty; commended, Jaffray Barcroft. Best of all the prize Bull, the gold medal, Wm. Owen. Second best, large silver medal, C. P. Leslie, M.P.

##### WEST HIGHLAND.

Best heifer, calved in 1856; best heifer, calved in 1854, giving milk, or in calf; and best cow of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, Wm. S. Trench, Montrath.

##### SCOTCH POLLED.

Best heifer, calved in 1856, large silver medal, Lord Talbot de Malahide.

Best heifer, calved in 1854, giving milk or in calf, large silver medal, Lord Talbot de Malahide.

Best cow of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, Edward Atkinson, jun., Donabate.

##### AYRSHIRE.

Best cow of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, A. B. Cane, Clondalkin.

##### ALDERNEY.

Best cow of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, Alex. M'Neale, Artane.

##### KERRY.

Best heifer, calved in 1854, giving milk, or in calf, large silver medal, P. J. Kearney, Clonmellon.

Best cow of any age, in calf, or having had a live calf within twelve months preceding the date of the show, large silver medal, J. C. Stronge, Donnybrook.

Best of all the prize breeding heifers, giving milk or in calf, the gold medal, Earl of Clancarty.

Best three heifers: under four years old, in calf, or having had live calves within twelve months preceding the date of show, and *bona fide* the property of the exhibitor, John J. Turner.

Best of all the prize milch cows, the gold medal, Rowland Campion.

Best three milch cows, in calf, or having had live calves within twelve months preceding date of show, and *bona fide* the property of exhibitor, Mrs. William Garrett.

Best of all the prize animals, the *Farmer's Gazette* challenge Cup, Jaffray Barcroft, heifer, "Maid of Kilbogget."

#### FAT STOCK.

JUDGES (and for mixed breeds: J. Borthwick, H. Croker, C. G. Grey. R. W. White. Steward—J. Bayley, D.L.

##### FAT OXEN.

###### SHORTHORN.

Best fat ox, calved prior to 1851, large silver medal, Nathaniel Barton, Straffan.

###### DEVON.

Best fat ox, calved prior to 1851, large silver medal, Earl of Shannon.

###### WEST HIGHLAND.

Best fat ox, calved in 1854, large silver medal, Earl of Dunraven.

Best pair of fat oxen, of any breed, that have been fairly and *bona fide* worked as plough bullocks up to May, 1855, large silver medal, Nathaniel Barton.

Best of all the prize fat oxen, honorary certificate, Earl of Shannon.

###### FAT COWS, of any age.

For the best shorthorn, large silver medal, Thomas Barnes.

For the best Devon, large silver medal, Edward Rotherham, Oldcastle.

For the best West Highland, large silver medal, J. O. G. Pollock, Navan.

For the best Kerry, large silver medal, Samuel Garratt, Navan.

For the best of all the prize fat cows, honorary certificate Thomas Barnes.

For the best fat heifer, of any breed, large silver medal, John J. Turner.

For the second best, lesser silver medal, Francis Donagh, Drogheda.

### S H E E P.

JUDGES: C. Going, R. Holmes, P. Thomalin. Steward—R. C. Wade.

#### LEICESTERS.

For the best one shear ram, three sovereigns, George Thunder, Navan.

For the best two shear ram, three sovereigns, John La Touche, Newbridge.

Best three hogget rams, never clipped, two sovereigns, George Thunder.

For the best five ewes with their lambs yeaned in 1857, or in lamb, two sovereigns, Wm. Owen.

Best five ewe hoggets, never clipped, two sovereigns, Wm. Owen.

#### LONG-WOOLLED,

Not qualified to compete as Leicesters.

For the best one shear ram, three sovereigns, James Kerr, Edenberry.

For the best ram of any other age, three sovereigns, Thomas Brown, Cheltenham.

Best three hogget rams, never clipped, two sovereigns, Richard Byrne, Dundalk.

For the best five ewes, with their lambs yeaned in 1857, or in lamb, two sovereigns, Thomas B. Brown.

Best five ewe hoggets, never clipped, two sovereigns, Richard Byrne.

#### SHORT-WOOLLED.

For the best one shear ram, two sovereigns, Charles Hamilton, Dunboyne.

For the best two shear ram, two sovereigns, Peter Broughton, Kells.

For the best ram, of any other age, two sovereigns, Hon. J. H. King, Harman.

Best three hogget rams, never clipped, two sovereigns, Peter Broughton.

For the best five ewes, with their lambs yeaned in 1857, or in lamb, two sovereigns, Edward Atkinson, jun.

Best five ewe hoggets, never clipped, two sovereigns, Phineas Riall.

#### CHEVIOTS.

For the best one shear ram, two sovereigns; for the best ram, of any other age, two sovereigns; best three hogget rams, never clipped, two sovereigns; and for the best five ewes, with their lambs yeaned in 1857, or in lamb, two sovereigns, Marquis of Conyngham.

Best five ewe hoggets, never clipped, two sovereigns, Lord Clermont.

#### FAT WETHERS.

For the best pen of five long-wool fat wethers, not exceeding two shear, large silver medal, Sir Richard Pakenham, Bart.

For the best pen of five short-wool fat wethers, not exceeding two shear, large silver medal, Major Tottenham.

For the best pen of five Cheviot fat wethers, large silver medal, George Kinahan, Newport, Tipperary.

### SWINE.

JUDGES: Hon. Captain Arbutnot, Captain Croker, H. Edmondson. Steward—H. Battersby.

#### COLOURED BREEDS.

For the best boar, six months, and not exceeding twelve months old, three sovereigns, F. W. Tomkinson, Kionegad. For the second best, two sovereigns, Lord Clermont. For the third best, the honorary certificate, Alexander Montgomery, Balliver.

For the best boar, exceeding twelve, and not exceeding twenty-four months old, five sovereigns, A. D. Chaigneau, Athlone. For the second best, three sovereigns, Robert Collins, M.D., Navan.

For the best boar, exceeding twenty-four months old, five sovereigns, Thomas Rutherford, Ardee. For the second best, three sovereigns, George Roe, Donnybrook. For the third best, the honorary certificate, Robert Collins, M.D.

For the best breeding sow, in pig, or having had a litter within six months, three sovereigns, Capel F. Adey, Cardiffe's Bridge. For the second best, two sovereigns, Gustavus R. Jones, Athlone. For the third best, the honorary certificate, Lord Talbot de Malahide.

For the best three breeding pigs of the same litter, under ten months old, three sovereigns, Thomas Rutherford. For the second best, two sovereigns, George Roe. For the third best, the honorary certificate, William Jameson.

For the best litter of pigs, not exceeding five months old, accompanied by the sow, three sovereigns, J. C. Metge. For the second best, two sovereigns, Robert Collins, M.D.

#### WHITE BREEDS.

For the best boar, six months, and not exceeding twelve months old, three sovereigns, J. H. Peart, Finglas. For the second best, two sovereigns James Cullen, Navan. For the third best, the honorary certificate, Thomas Rutherford.

For the best boar, exceeding twelve, and not exceeding twenty-four months old, five sovereigns, Lord Lurgan. For the second best, three sovereigns, Wm. Boyle, Glasnevin. For the third best, the honorary certificate, Colonel Hill, Outlands.

For the best boar, exceeding twenty-four months old, five sovereigns, Thomas Rutherford. For the second best, three sovereigns, J. H. Peart.

For the best breeding sow, in pig, or having had a litter within six months, five sovereigns; and also for the second best, three sovereigns, William Bayle. For the third best, the honorary certificate, Thomas Rutherford.

For the best breeding sow, in pig, or having had a litter within six months, three sovereigns, Charles L. Ellison, French Park. For the second best, two sovereigns, J. C. Metge, Navan. For the third best, the honorary certificate, Lord Lurgan.

For the best three breeding pigs, of the same litter, under ten months old, three sovereigns, Thomas Rutherford. For the second best, two sovereigns, William Bayle. For the third best, the honorary certificate, Thomas Rutherford.

For the best litter of pigs, not exceeding five months old, accompanied by the sow, three sovereigns, Thomas Rutherford. For the second best, two sovereigns, James L. Naper, Olccastle.

### THE FOLLOWING ANIMALS WERE COMMENDED: BULLS.

SHORTHORNED, calved in 1856: John Keating's, Jonathan Richardson's, Lord Dufferin and Clandeboye's, and Richard Chaloner's. Calved in 1855: Hon. L. H. King Harman's, Major Quentin's, and P. J. Kearney's. Calved in 1854: C. L. Ellison's and F. W. Cusack's.

ALDERNEYS: Earl of Charlemont's.

BEST BULL OF ANY BREED: Jaffray Barcroft's.

### COWS AND HEIFERS.

HEIFERS calved in 1856: Henry Strafford's, J. Richardson's, Lord Dufferin and Clandeboye's, Thomas Barnes's, R. W. Reynell's, Lord Lurgan's, Viscount Monck's, Thomas Ball's, and George Perrin's. Calved in 1855: Earl of Clancarty's. Calved in 1854: Hon. L. H. K. Harman's.

SCOTCH POLLED, calved in 1854: A. Barcroft's, and Lord Talbot de Malahide's heifers.

AYRSHIRE—Cows of any Age: Hon. Thos. Preston's.

FAT STOCK—Cows of any Age: J. F. H. Briscoe's, P. J. Kearney's, and H. B. Coddington's.

### SHEEP.

LEICESTERS: C. P. Leslie's one-shear ram, J. Barcroft's two-shear ram, W. Owen and R. W. Reynell's three-hogget rams, and P. Riall and John T. La Touche's five-ewe hoggets.

LONG-WOOLLED: Hon. L. H. R. Harman's five-ewe hoggets.

SHORT-WOOLLED: George Lambert's ram.

CHEVIOTS: Lord Clermont's ram and his three hoggets.

FAT WETHERS: Sir Edward M'Donnell's five long-wooled.

### PIGS.

COLOURED BREEDS: Thomas Rutherford's boar, the Rev. J. Warburton's breeding sow, and Robert Collins, M.D., litter of pigs.

WHITE BREEDS: William Boyle, for sow in pig and his best litter of pigs.

(FROM A CORRESPONDENT.)

As a whole, this show must be considered somewhat inferior to any of those of the last four years; but, though the number of bulls is less than on former occasions, still the general quality of the classes is not inferior, as it is in the worst class of animals the numbers are deficient. Still it is a total want of any one or two of those extraordinary animals that, even when put in any class, will at once be seen to be possessed of extraordinary merit, that this show falls so much short of former ones, as in the bull-classes there is not a single animal of this description.

During the first day, and for the greater part of the second and third, the rain fell incessantly, and threw a complete dulness on the proceedings. When we add to this the dissatisfied faces of the exhibitors, and the thoroughly soaked-through appearance of those that were trying to get about to make purchases, it is not to be wondered at that even the fair ones who came forward during the few dry hours of the second day failed to produce the slightest resemblance to the gay and animated scene that on former occasions have crowned the meetings of this Society.

As to the real business character of the meeting, anything second class was a drug, but for real good animals there was a brisk demand, and we have never seen more good animals sold for high prices. This was in a great measure attributable to Mr. Strafford, with his three Illinois friends, Messrs. Brown, Johns, and Jacoby, being present, as well as Mr. Greene, from Australia, who, in the quietest possible style, were not long in taking off the cream of the yard.

In looking over the show, in order of the catalogue, the very first animal is a good and commended one, bred by Mr. Richardson, and by Mr. Towneley's Valiant. No. 2, bred by same and by same bull, is third prize in the class, and is an animal of very good quality (as are all the Valiant stock in the yard), but there is an openness between his ribs and loins, a straightness of the shoulders, and a plainness about the tail, that make us think he was put a little too forward in the position of third. Passing on to No. 4, we come to Lord Dufferin's entry. This animal is by Valiant; is a good red roan of capital quality, level back, and even flesh, we thought he deserved at least a commendation. No. 5 is a commended animal, bred by the same exhibitor, and got by same bull. Passing on to No. 12, we come to Mr. Thomas Lee Norman's bull. This is the first prize of the Yearling class, and in many respects is a very extraordinary animal; his large size for a yearling, his wonderfully well-covered back, and the great amount of flesh he carries for the age, fully entitle him to the position he holds, which is quite as much as we can say for him. At 27 we find a full brother to the celebrated yearling of last year: this one, though a good animal, is far short of the mark. At 28 Mr. Chaloner has also a commended animal; indeed a first-class beast—we have seldom seen better quality, or finer fore shoulders. Such veins and clust, wonderfully good behind the elbows (or lower part of girth), good ribs,

grand loins, well covered pins, well furnished to the tail, with a regular Booth pair of quarters and flank, make this, indeed, a nice animal, but those shoulder-tops a little behind them, and extraordinary forelegs, so peculiar to Hopewell and his stock, are doubtless what made the judges leave him with a mere commendation. At 29 Mr. Chaloner has also the second prize bull, a good animal, by Emperor (a son of Hopewell's). At 41 is a nice red animal, bred by Mr. Topham, has capital ribs, loins, and hind-quarters, and very good head and chest. This animal we understand goes to America. At 63 is a nice animal, of very good quality and beautiful hair, and has been very justly commended. Among the other entries are many fine animals, but time will not permit our particularizing them.

In section 2, for bulls calved in 1855, there are but few good animals except those which are commended. No. 107, Major Quentin's, a good lengthy animal; No. 109, Mr. P. J. Kearney's, a nice compact animal; and No. 121, the Hon. L. H. King Harman's, a very good animal, but with a want of coat and light twist, which obliged him to succumb to No. 130. The second prize a very grand red bull, with capital loins, well-spread pins, and nicely finished to the tail, but stands a little high on his legs; but being but a late two-year-old, we think this a fault he will soon overcome. He is by Phoenix, and the property of Lord Talbot de Malahide, and is now, we understand, purchased to go to America. At No. 131 stands the first prize, the property of Capt. Thomas Ball, is a very compact well-covered animal, with good quality and good substance.

In section 3, for bulls calved in 1854, the first prize awarded to No. 138—a well covered animal, with a great number of good points about him; and has also been awarded the silver medal as second best of all the prize bulls. He is also purchased for America. He was bred by Mr. Cruickshank, and exhibited by Mr. C. P. Leslie. No. 145 is a white animal, by Valiant, of good quality, has been commended, and is the property of Mr. C. L. Ellison. No. 147 is the second prize in this class, and is the well-known bull Jacob, bred by Mr. Ambrose Bole: he has a great many good points about him, and is doubtless a good animal, but his shoulder-tops, head, and horns are not those a first-class Shorthorn should have. No. 148, exhibited by Mr. W. Cusack and bred by Mr. W. Coppinger, is one of the best fleshed and covered animals we ever saw, and fully deserves being highly commended as he is. He is also to go to America.

In the Hereford class there are no entries.

In the Devons there are some very good specimens of that breed, especially No. 155, the property of Mr. W. Coppinger, which is one of the best animals of the breed we have ever seen.

In the West Highland and Scotch polled there was no merit.

A few nice Alderneys and Kerrys.

In class 10, for the best bull of any age first prize to the well-known bull Gainford the 4th, who also got the gold medal as best bull in the yard. He is still the property of Mr. W. Owen. No. 176 is the Earl of Clar-

carty's bull, Pro-bono-publico, bred by Mr. A. Cruickshank; he is a very large animal, but far too lumpy even to have filled the place he did last year. In this class is also the well-known bull Matadore, and many other good animals.

We next come to class 10, section 10, for the best heifer calved in 1856. Without doubt this is the first class in this year's show, and is the only one that can be considered quite up to the standard of former years. In it we have, beside the first and second prizes, and a highly commended, no less than eight commended animals, any one of which is well deserving of a prize. The class commences at No. 183, in which number stands a beautiful white heifer of Mr. Richardson's, by Valiant; nothing could be better than the quality and hair of this animal: the shoulder points being a little coarse, and her tail not being well set on, soon put her, that she could but get a commendation in this class. At No. 185, Lord Dufferin has also a good heifer, by Valiant, which fully deserved its commendation; but at No. 187 we come to Mr. Barnes' second prize heifer; she is by Hopewell, and is a very beautiful heifer; her great length, rich colour, and a sweet Short-horn style all over her, carried her through to second place, after a very close competition with Mr. H. Strafford's heifer No. 190, which animal, for general depth of flesh, well and evenly-furnished back, great hind quarters, and wonderful twist and dug, no animal in the yard could compete with; but a plain red colour, a short neck, and consequent want of style, combined with a slight lameness, obliged her to yield second place to Mr. Barnes' heifer, notwithstanding her great substance and depth of flesh. Both heifers, we understand, go to America. At No. 188 Mr. Barnes has also a very nice heifer, which was commended, and, together with No. 187, fully sustain the high character of that gentleman as a breeder of Short-horns. No. 196 is Mr. J. Barcroft's heifer, the Maid of Kilbogget. To this animal is awarded, not alone the first prize in her class, but also the 100 guinea cup, as the best animal in the yard of the breeding classes. She is perhaps one of the best-shouldered heifers that has been seen here these many years, with a general even carcase, combined with a nice colour, and the gayest and most stylish carriage when taken out we ever saw: all fully entitle her to go first of her class, notwithstanding there being a considerable falling off in her hind quarters; but we think it something of a mistake to give her the cup before Mr. Champion's cow Jenny, as few men of judgment will pronounce her a heifer ever likely to grow as good a cow. At No. 205 we have Capt. Ball's commended heifer, with good quality and flesh. In this class there are some other very good animals, and even a few more commended, but, in comparison with those we have mentioned, they scarcely deserve the honour.

In section 11 we have No. 213 taking first prize and the gold medal for breeding heifers, a compact, close heifer, with great substance; she is the property of the Earl of Clancarty. No. 210, the property Mr. J. J. Turner, took second prize in the class—a compact, well-

fleshed heifer, but a great want of style makes but an ordinary animal of her. No. 212 (the Earl of Clancarty's) was commended, but is something the same class of animal as the second prize.

In section 12, No. 216, the Hon. L. H. King Harman's is commended. No. 219, Mr. Turner's heifer, got second prize; and she and No. 218 and No. 210 of section 11 were awarded the gold medal as the three best breeding heifers, one property (no competition); and No. 220, Lord Monck's, has been awarded first prize in this class, and is a heifer that promises well to make a good large cow.

In section 13, for the best cow of any age, No. 223 got second prize, a very good animal, and with No. 224 and No. 225 was awarded the gold medal, as the three best cows, one property, and are Mrs. W. Garnett's: they are three very good quality cows, and not in high condition. No. 228 is Mr. R. Champion's cow Jenny, and is far beyond anything in this class; and, in fact, beyond anything in the yard: the grand length, broad, level back, even flesh, and beautiful style of this cow cannot every day be equalled: she is indeed a grand specimen of the Bates' stock, from which she comes. In this class none are commended; but we think the judges need not have been so severe on No. 226, the Hon. L. H. Harman's cow, as she is rather a good animal.

In the other breeding classes there was nothing of extraordinary merit, though in many of the classes there were some good animals shown. In the fat stock there were some good animals, but time will not permit to go into details of them.

The Sheep show this year was by far the best the Society has had, but they could not be seen to advantage, the ground about them was so cut up, and they were so drenched with rain.

The pigs were a good average show, and many fine specimens were purchased to go to America.

The show of horses was a vast improvement on former ones, but still far short of what it ought to be.

Poultry, a good average.

Farm implements, one of the best collections ever seen in this country, most of the first English makes being present.

#### THE EVENING MEETING.

The following paper was read by Mr. L. E. Foot, one of the honorary secretaries of the society, on "The Paris International Cattle Show of 1856:—

"The recurrence of our Annual Spring Cattle Show has appeared to the Committee of Agriculture to afford an appropriate opportunity for giving some account of the part taken by this society in the great French International Cattle Show, and, as one of the secretaries, I have been requested to undertake that duty. It is, no doubt, in the recollection of many I have the honour to address that the French Government included in its world-wide invitation to a competitive display of animals, agricultural produce and implements, to be held in Paris, the two societies in Ireland labouring, in friendly rivalry, to promote agriculture as a means of national improvement—I mean our own and the Royal Agricultural Improvement Society. At the judicious suggestion of M. de Burggraffe, the respected and well-known Consul of France resident in this city, through whom the invitation of the Minister of Agri-

culture was forwarded, the two societies agreed to give their cordial co-operation by means of a joint committee, and to defray the necessary expenses, this society giving the accommodation of its premises and the services of its officers in furtherance of the common object. Independently of its universal character and variety, the Paris Cattle Show presented other distinctive features from those held in the British dominions. In Great Britain and Ireland the progress of agriculture has been the result of individual enterprise and experience, encouraged, it is true, by voluntary association, but left by the state to find its own reward in the skill and public spirit with which it is prosecuted. In France, on the contrary, agriculture is a state interest, confided to the superintendence and solicitude of a separate government department. Through the Minister of Agriculture and Commerce the state controls, sanctions, rewards, encourages, or prohibits all matters relating to the soil and its products; there we find established by government, in great numbers, 'Fermes-écoles' (Farm or Model Schools), with a code of rules and regulations, for the instruction of pupils in agriculture. (See 'Compte Rendu,' 3rd October, 1858). Also government 'Vacheries,' or cow parks; government 'Bergeries,' or sheep walks; government 'Haras,' or stud houses, for the breeding and preservation of stock. In fact, in all matters relating to the encouragement of agriculture in France, the government makes the rules, controls the proceedings, pays the expense, organises and directs what in these countries is left to the option of individual will and enterprise. (See 'Le Tattersall Français.') It may, therefore, easily be imagined that the most celebrated of our voluntary associations, even the Highland Society of Scotland, or the Smithfield Club, must have paled their ineffectual fires before an exhibition which had a palace, with an area of 30 acres, for a cattle yard, the resources of a nation for its treasury, and the munificence of an Emperor in the profusion of its rewards; no less a sum than £2,300 being given in prizes among the English, Irish, and Scotch exhibitors of stock and implements, exclusive of gratuities to herds and caretakers. Now, bearing all this in mind, it must be gratifying to learn that the agricultural character of Ireland in the eyes of the world was worthily upheld upon an occasion so trying, and I accept the duty of satisfying my hearers on this point by a brief analysis of the entries and prizes in those descriptions of stock most highly esteemed in these countries with which we are most familiar, and in which alone we competed. The first section of the first class consisted of improved shorthorns, bred or imported by foreigners, and the property of foreigners, or Frenchmen. The prizes in this section were numerous and liberal, ranging from 1,000 to 200 francs, or from £40 to £8 of our money. Of 119 entries in this section which actually exhibited, the prizes and commendations were as follows:—20 to England, 9 to Ireland, 3 to Scotland, 3 to France, and 1 to Belgium. England and Scotland exhibited 78 animals in the short-horned class, and obtained 20 prizes, or less than one-fourth; Ireland exhibited 21 animals, and got 9 prizes, or nearly one-half. There was a fine class of Ayrshires, comprising 97 entries, in which, as may be supposed, the Scotch were most successful, carrying off 21 prizes. One competitor, however, from Ireland was successful, Dr. Kirkpatrick, of the Model Farm, Glasnevin, whose very fine bull received honourable mention. In Polled or Angus cattle, out of 39 entries, Scotland took 25 prizes and commendations, Ireland one, Lord Talbot de Malahide the third, and a bronze medal for a fine heifer, and France one. To Lord Talbot de Malahide belongs the credit of being the first to introduce this breed to the notice of the Paris public, having exhibited an Angus bull in 1855, which won for him a gold medal. In the West Highland breed the Scotch exhibitors had it all to themselves, having taken 12 prizes out of 31 entries—the Duke of Sutherland obtaining first prize for a five-year old cow from Drumlin. However, Mr. William Stewart Trench, of Cardtown, sustained the credit of Ireland by exhibiting in this class one bull, three cows, and one heifer. But now we find Ireland pulling up. In Kerries there were 23 entries, and 11 prizes were awarded to Irish exhibitors. The prize-takers in this class, which seemed to be specially encouraged by French authorities, were, for bulls, Lord Talbot de Malahide, Mr. George Roe, and Mr. Edward C. Irvine, of Hampton, Drumcondra; for cows, Mr. O'Reilly Dease, Mr. George Roe, Mr. William Stewart Trench, Sir Percy Nugent, Mr. William Owen, and Lord Talbot de Malahide, who obtained a gold medal for the best Kerry bull. When speaking of the foreign breeds as not necessary to be

particularized, I except certain French breeds—some of which, as the Normanders, were remarkable for their fine appearance, and looked like good milkers. Of these there were 61 entries. Normandy excels most parts of France in the beauty and richness of its pastures. I have seen it stated that the large-boned Normand animals, the best of the French breeds, cannot be transplanted, because they require better grass than most districts afford. Hearing this, it may occur to some present to ask the question—To what purpose, then, do Frenchmen purchase our Durhams, Devons, and other first-rate stock, if they have not good grass to give them? This obvious question need not be asked of an English or Irish breeder; for with us high farming and root cultivation, in addition to a cooler and moister climate, have put almost all countries on a par. And here we arrive at a marked distinction between our agriculture and that of France. We cultivate and improve the land, with reference to the sustentation of the best stock; in France they seem desirous to improve their stock, neglectful in a great degree of the conditions on which their nourishment and growth depend, viz., abundance of nutritious food, only to be extracted from land naturally good or artificially improved. A number of the *Royal Agricultural Society's Journal*, published about the time of the Cattle Show, contrasted French and English farming. In some remarkable particulars, amongst other things, it states that the Englishman, by devoting a considerable area to green crops and the raising of cattle, not only maintains the fertility of his fields, but produces more wheat from a smaller surface. England, it seems, is not larger than a fourth of France; yet the writer, who is a Frenchman, avers that, taking all products into account, animal and vegetable, the produce of England per 'hectare' nearly doubles that of France. The French 'hectare' contains two and a half English acres. Such, however, were not the breeds to which our French friends attached most importance; they boldly entered the lists in our favourite stock, and fifty-five entries of Durhams, by French owners, evinced the estimation in which the high bred short-horns are held in France. The animals exhibited were, generally speaking, considered well bred, and most of them had been obtained from the best English blood. Independently of the several French and foreign pure breeds to which I have hitherto been adverting, there was catalogued a separate category of what were denominated 'sub-races' produced by crossings, principally with the Durhams, and intended, no doubt, to illustrate M. St. Marie's doctrine of this method of improving native races. The Emperor exhibited an Ayrshire bull and heifer from his farm at Villeneuve; also a Durham cow called 'Duchess,' from Prince Albert's herd. These, with some good animals reared in the different agricultural schools and establishments of the state, were not entered for competition. I pass now to sheep. The exhibition was rich in this class of animals—the English and Scotch owners of some fine specimens of Cotswold, South Downs, Hampshire Downs, Leicesters, and black-faced Cheviots, were very successful in obtaining prizes. Nor was Ireland without a share of credit, the Honourable King Harman having obtained a prize for a pen of hogget Leicester ewes, and Mr. William S. Trench, Cardtown, a prize for a Cheviot ram 15 months old. The sheep sent from Ireland, as might be expected, were few, and confined to the above-named spirited gentlemen. Of foreign breeds there were about 1,500 ewes and rams, of which the pure Merino of Saxony attracted most notice. A ram belonging to Prince Esterhazy took the first prize in this class. The best English and Scotch breeds, in order to make two-year-old mutton, take the place of that fabulous article, which our butchers persist in assuring us has survived four summers. Foreigners are beginning to find out this secret, and now give large prices to British breeders to improve their long-necked and long-legged breeds, hitherto valued almost solely for their wool. In the same journal, already quoted, I find it stated that the weight of an English sheep is twice that of a French sheep; and that an English farm on an equal surface gives six times as much mutton as a French farm. On pigs I do not intend to dwell; there were about three hundred exhibited, of which the large Yorkshire were the most conspicuous. I shall not trouble my hearers with any description of the five hundred lots of poultry which were exhibited, very fine and interesting, but not exceeding in any particular that I am aware of, those general characteristics with which we are here familiar. Some information respecting the French judges, and their mode of proceeding, may prove interesting. It was the wish of my brother secretary and myself to obtain

a series of reports for the information of the society, from such of our members and others as were juniors or exhibitors, and we have been favoured with some communications, which, coming from practical men, possess great value. The first I shall submit to you is from a gentleman well known as a judge at our shows, Mr. Charles George Gray, of Ballykisteen. He writes, in reference to the Paris Exhibition—"As a judge, and not an exhibitor, horned cattle came more especially under my notice. Of this, as of many other shows, it may be said, that there was a fine collection of animals; but the most striking feature to my mind was the manner of making awards. Having been accustomed to act as a judge in England, Scotland, and Ireland, where I was generally associated with one or at most two colleagues, and to discuss calmly and slowly the different merits and deficiencies of different animals, returning again and again to the same animal, I was utterly confounded, on finding myself one of a jury of twenty members, running hastily along the line of animals, and being required almost before I had seen them all once, to give a vote in favour of one or another of them, when several serious mistakes had been made in the judgment of shorthorns. I, with my fellow jurors from England and Scotland, requested an explanation of the principles on which we were to frame our judgment, as it appeared to us that the French jurors looked at the animals solely with a view to their milking qualities. This explanation was not allowed to be made, and we were hurried on in our decisions, in which we British were invariably in a minority. Mr. Gray is of opinion, the Paris Exhibition was deficient in not having had a show of horses, of which there are some remarkable breeds in France. Major Quentin was one of the jury on shorthorns; he has favoured the society with some observations, in which we find a perfect identity of opinion with Mr. Gray as to the unsatisfactory composition of the juries. Our Vice-President, Lord Talbot de Malahide, was not appealed to in vain for a report on the department in which he acted as a juror; that was section 3, embracing vegetable, animal, and mineral productions. Time does not allow me to give this valuable document in extenso; but it will not be withheld from the public, whom it cannot fail to gratify and instruct. Lord Talbot expressed regret that there were no samples of Irish wool, butter, bacon, honey, oatmeal, porter, beer, preserved meats, to be seen; and although a

couple of Limerick hams, and as many bottles of Irish whiskey, were on the counter of the exhibition, it cannot be said that these most important branches of Irish industry appeared in the most favourable light. An analysis made by Lord Clancarty shows that Irish exhibitors obtained a prize for every third beast entered; those from Great Britain obtained one prize for every four beasts; those from Scotland one for every eight beasts; and those from the Continent one for every tenth beast. His lordship states that there were exhibited at Paris, from Holstein, sheep of the most extraordinary size, fecundity, and power of rearing their offspring. Three ewes were shown, each rearing three lambs, and three more, each rearing four lambs, all apparently doing well, and the lambs of great size and promise; judging from the geographical position of Holstein, Lord Clancarty thinks the climate of Ireland well suited for the Holstein breed, which, either pure or crossed with our present race of sheep, would be a valuable acquisition; his intention was to have imported some, but for the disease before alluded to. The implements of husbandry were numerous and varied; no less than 2,107 lots were exhibited—of these 371 belonged to the United Kingdom, the superiority of which was conspicuously demonstrated all through the prize list; thus out of 153 prizes awarded, although British exhibitors had only 371 lots out of 2,107—that is, little more than one-seventh—they gained 58 prizes, or more than one-third of the whole. Having now given an imperfect review of this memorable exhibition, principally with reference to the part taken by this society, I feel that I should very inadequately fulfil my task did I not briefly allude to the great obligation the society is under to its noble president, his Excellency in the chair, for the cordial assistance rendered by him to your deputation in the important matter of presenting our address to the Emperor of the French.' 'I conclude by taking this public opportunity of expressing for myself, my colleague, the members of the deputation in Paris, and for the society collectively, our united acknowledgments to his Excellency for the kind interest taken by him on an occasion so important to the prestige of the society, the result of which has tended to uphold its position abroad, and increase its influence at home; thereby securing, we venture to hope, to future times, a long course of that usefulness and public good which we have this day witnessed, and are now assembled to rejoice over.'"

THE PRESENT CONDITION AND FUTURE PROSPECTS OF IRELAND,

RELATIVE TO THE EXPORTING POWER OF THAT COUNTRY AS COMPARED WITH THE PAST.

SIR,—I shall now consider the third proposition of the "Waterford Mail," namely, that "the decrease in the population, by emigration or otherwise, between 1846 and 1851 is an evil, because less corn has been exported from Ireland in the five years from 1850 to 1854, than in the same period from 1840 to 1844 inclusive."

By a reference to the census of 1841, I find the population of Ireland then stood at 8,174,031. Nothing occurred the following five years to arrest the natural increase, which should have been according to the previous rate; but we also find that in 1851 the census exhibits an actual decrease of 1,623,821: and even these figures do not give the whole extent of the loss. There must be added to it the increase by births, which if we estimate only for the five years from 1841 to 1846 at 1½ per cent. per annum, the amount will stand as follows:—

Census of 1841 .....	8,174,031
Increase in five years, at 7½ per cent. ....	613,052
Population in 1846 .....	8,787,083
Census of 1851 .....	6,550,210
Actual decrease .....	2,236,873

This remarkable decrease in the population of Ireland in five years arose from three distinct causes, namely, famine, fever, and emigration. I have taken some pains to ascertain, as near as circumstances permit, the actual proportion which each of these bore in the work of decimation; but whilst the last item is clearly defined, and determines the combined amount of the first and second, the entire absence of a register of births and deaths in Ireland makes it impossible to establish a satisfactory basis on which to form even a proximate estimate of the proportions which famine and pestilence respectively bore. I have, however, reasons to believe, both from personal observation and from authentic reports, that the number which died of actual starvation was small compared with that which was subsequently carried off by the fever, superinduced by insufficiency and unwholesomeness of food. In 1848, too, the cholera appeared, and for two years made dreadful havoc amongst the poor, whose physical energies were already reduced by their previous privation of food. In estimating, therefore, the proportions, I am compelled to class the famine and pestilence together, and obtain the following result:—



Emigration returns from 1841 to 1851. . . . .	1,430,524
Migrations to England, Scotland, &c., say . . . . .	169,476
Total . . . . .	1,600,000
Loss by famine, fever, and cholera. . . . .	636,873
Total loss as above . . . . .	2,236,873

The writer in the *Waterford Mail* confines himself, in his strictures, to emigration, to which he gives the popular names (with Irishmen at least) of "exportation or transportation." A celebrated divine, who had a very inquisitive wife, was sitting in his study one day in deep thought, when the lady knocked at the door.

"Well, my dear, what do you want?" said the divine, who was not unused to these interruptions.

"I want to know," said the lady, "the difference between being exported and transported."

"Now, pray go away, and don't trouble me with such silly questions, when I am busy."

"But I must know, and won't leave till you have told me."

"Well, then, the difference is this—if you were to be exported, I should be transported." This closed the colloquy.

And this too is precisely the case with the Irish emigration—a voluntary affair, however, although the *Waterford Mail* seems disposed to throw the onus upon some unnamed party; probably the Government, as having the broadest back to bear the load. In opposition, however, to the writer, I maintain that emigration has benefited Ireland in an extraordinary degree, and that the landed interest in particular has abundant reason to be satisfied with the decrease of population from this cause, by the removal of a dead weight of pauperism which weighed down three of the four provinces of that country; and I further assert that that pauperism was the direct result of the political state of the country up to the year 1848, and the means used by the O'Connell party to obtain the ascendancy in the representation in Parliament. For this express purpose the forty-shilling voters were created; and as the subdivision of the land, as practised in Ireland, made almost every peasant a land-holder to that extent, the object of the party was thus far successful. But what was the consequence? Destitute of the means of cultivating the land in a proper manner, they resorted to that description of crop which yielded the largest produce at the least expense of labour and outlay; and the potato was the universal crop and the exclusive food of the peasantry. The con-acre system, too, was carried to a great length, and added to the amount of poverty by the high rent—frequently ten pounds per acre—given for land under it. The well-known system in Munster and Connaught was for the occupier to prepare his land in the spring, and plant it with potatoes. He then left his family to manage the hoeing and weeding of the crop, whilst he migrated to England, to procure by his labour, at haytime and harvest, the means of paying his rent. In the mean time the family at home subsisted on the remains of the previous crop; and if that held out till the new one came in, all well and good. If not, they begged of their neighbours, who, to do

them justice, are always willing to share the last potato or cup of milk with those who are more destitute than themselves.

That up to 1846 there was an injurious surplus of labour in Ireland is proved by the enormous amount of migration to England and Scotland at certain seasons, and by the extremely low price of labour at home, at all times. I have myself known able-bodied men hired by the hundred, in some of the remote districts, at 3½d. to 4d. per day; and in many cases in which the proprietor was poor, the labourers were uniformly paid in potatoes or oatmeal and buttermilk, and scantily enough of that, not seeing the colour of money from one year's end to another. Thus, it was as plain as the sun at noon-day, that the land, which was the sole resource of the peasantry, was overdone with population, and that either emigration or disease, or both, must soon come in aid, to reduce it within those bounds which the well-being of the country demanded.

The annihilation of the staple food of the people in 1845, and two following years, suddenly brought on the catastrophe. They were too poor to resort to better food, and there was no worse description for them to fall back upon; consequently they died by hundreds and thousands of starvation, and that notwithstanding the large grants, both national and eleemosynary, that were distributed throughout the country, in money and food. The pestilence followed close in the train of famine, and completed its work. It will give some idea of the extent to which fever prevailed at that time, when I state, that in 1846 and 1847 seven-hundred and fifty medical men were carried off by it in that country.

I shall now endeavour to show the effect produced, by the loss of the potato, on agriculture generally, and the corn-exporting power. It is self-evident that such a loss, amounting as it did to more than twenty millions sterling, must have impoverished the landed interest. Many of the estates were deprived of the whole of their tenants, partly by emigration and partly by the famine and pestilence, and the land lay waste. I travelled a good deal through the country at that period, and had an opportunity of seeing to what an alarming extent this was the case. The small cottiers, occupying from one to ten acres, of which the majority was composed, were sunk in such hopeless despondency, that even their patches of garden-ground lay neglected and waste. In the richest districts, such as Tipperary, West Meath, and Limerick (counties), the land which had previously produced 20 barrels of wheat per Irish acre—equal, at 60 lbs. per bushel, to 62 bushels per English acre—fell off more than half, owing to the disuse of lime, which the farmers were no longer able to purchase. On the other hand, the emigration-fever had set-in; and in preparing for this, the land was run out by repeated cropping without manure, until it would produce nothing. Three English farmers I am acquainted with, took land in Roscommon, which, naturally, possessed a deep alluvial staple; but so completely was it worked out, that it was more than three years before they could bring it into even a tolerably productive state. This I know to have been the state of the land in every part except the north,

where a different race prevails; and it continued until the Incumbered Estates Court began to operate, and the Land got into the hands of a new proprietor, who possessed both the means and the inclination to restore it to fertility and productiveness.

But now came a question, which in its solution materially affected the corn-exporting power of Ireland—namely, which will pay best, cattle and sheep, or corn? Owing to the low price of corn from 1848 to 1852, and with the fear of free-trade before their eyes, the decision was generally in favour of the former: large tracts of land were converted into pasture, and the breeding and feeding of cattle and sheep became the order of the day; whilst that portion still under tillage for corn crops was comparatively small to what it formerly was. This alone will account for the decrease in the export of corn between 1850 and 1854, as compared with that between 1840 and 1844. Grazing and breeding paid better than corn growing, and was therefore better attended to.

But another cause has also operated, and will continue to operate more and more every year. During the famine the peasantry were compelled to resort to the use of cereal food; and having acquired a taste for it, they continue to use it now that the increase in the value of labour enables them to do so. We may hope in future to find the condition of the peasantry gradually ameliorated by the infusion, through the Incumbered Estates Court, of that yeomanry class, the want of which

has been one great cause of Ireland's misery. Destitute of manufacturing and mining industry (except in the north), the land was the sole support of the rural population. Badly cultivated and badly arranged, it was incapable of supporting more than a certain amount of population, in a condition fit for human beings, or consistent with civilization. If any one is disposed to dispute this assertion, let him account otherwise for the extremely low value of labour, the large amount of it transferred annually to England and Scotland, the miserable fare on which the peasantry subsisted, and the universal mendicancy that prevailed throughout the country. All these evils are disappearing in consequence of the emigration. A mass of humanity has been removed, worse than useless, on account of the constant state of discontent and disaffection which such a condition of misery produced; the Irish labourer now is well paid; the pauperism, which at one period threatened to overwhelm the whole of the landed interest in one common ruin, has disappeared; a spirit of improvement has arisen in the agricultural body; and, if agitation can be held in abeyance, we may yet see Ireland rise from her degradation and calamity, and become, what she is well calculated for—a help instead of a hindrance, a blessing instead of a bane, to her sister England.

Yours truly,

London, March, 1857.

S. C.

## IMPROVEMENTS IN TREATING FLAX, HEMP, &c.

Among the more important novelties in the march of progress which the Chelmsford Meeting of the Royal Agricultural Society of England produced was Burton and Pye's proposition for the manufacture of flax, hemp, and like fibrous products. In all ages of the world the cultivation and first process in the manufacture of the flax plant (*linum usitatissimum*) have engaged the special attention of the agricultural interest; and although in this country much prejudice has existed to its growth, yet of late years, owing to the rapid progress made in agricultural chemistry, that prejudice has been fast giving way, and now the last objection has all but been removed. The discovery merits the special attention of the readers of the *Mark Lane Express*, as the samples of flax and cattle food exhibited in all the stages of manufacture proved.

The proposition has a two fold object—*first*, to obviate the objectionable process of retting; and, *secondly*, to work up the bolls and boon or woody part of the plant into food for cattle; both divisions coming in as an adjunct to Davy's system of separating the boon from the flax by mechanical means without the old method of steeping in water.

It is thus interesting to review the different links in the chain of progress; and to comprehend the real merits of the project before us, it will be necessary to take a retrospective glance at the whole.

Of the old process of steeping in water, spreading on

grass, lifting, drying, breaking, and scutching, we need say little to those who have been engaged in it, it being from first to last objectionable in every sense of the word. At every stage of the process, for example, the waste of flax is incalculable, while manual labour is dirty in the extreme, subjecting the labouring population to filth and slavery of the most degrading kind; while ponds, streamlets, and rivers are so polluted as not only to destroy fish, but to be unfit for being used by cattle, and while the atmosphere of the country during the period in question is pestilential to its whole population.

Among the first improvements from this state of things was that made by M. Schenk, who accelerated the process of fermentation in the separation of the flax from the boon by heated water, the water being gradually heated by steam in large vats, into which the flax is steeped. When removed from them, it (the flax) is dried in a "hydro-extractor" by means of centrifugal force. The hot water, however, reduced the strength of the fibre, while the drying process allowed offensive gummy matter to adhere to it. To obviate these, Mr. Pownall, instead of drying the flax after fermentation, subjected it to mechanical pressure while in a wet state, and the action of a stream of water for removing the deleterious adhesive matter. Mr. Watt followed by a still more successful process of maceration. According to it, "the flax straw is delivered at the works by the producer in a dry state, with the seed on. The seed is

separated from the straw by metal rollers, and afterwards cleaned by fanners. The straw is then placed in cast-iron close chambers, with the exception of two doors, which serve for the purpose of putting in and discharging the straw. The top of these chambers serves for the purpose of a condenser. The straw is laid on a perforated false-bottom of iron, and the doors being closed, and made tight by means of screws, steam is driven in by a pipe round the chambers and between the bottoms, which, penetrating the mass at first, removes certain volatile oils contained in the plant, and afterwards is condensed in the bottom of the iron tank, and descends as a continuous shower of condensed water, saturating the straw. This water is a decoction of extraction matter, to which attach the fibrous and more porous portions. This liquor is run off from time to time, the more concentrated portions being used along with the chaff of the bolls for feeding cattle and pigs. The process is shortened by using a pump, or such an arrangement as rapidly washes the mass, with the water allowed to accumulate. In about eight or twelve hours, varying with the nature of the straw, it is removed from the chambers, and having been robbed of its extraction matter, it is then passed through the rollers, for the purpose of removing the epidermis or skin of the plant, and of discharging the greater part of the water contained in the saturated straw; and while in a wet and swollen state, splitting it up longitudinally. The straw then being free from all products of decomposition, is easily dried, and in a few hours ready for scutching." The Society for the Promotion of the Growth of Flax in Ireland appointed a committee to investigate Watt's process thoroughly by experiment, and their report speaks in the most favourable terms, as the following results show:—

Tons of Fibre.

"100 tons of straw by Schenk's process yielded... 5.90  
 "100 tons of straw by Watt's process yielded... 12.20"

But great as these results are, Mr. Davy, by the mechanical means already stated, greatly shortened the process, increasing at the same time the quantity and quality of the flax. Mr. Davy's process has been so recently discussed in the columns of the *Mark Lane Express*, that we need not enter upon its details.

Lastly, we come to Burton and Pye's improvements specially under investigation.

Under this practice, the flax is harvested under what is technically termed the "Coutrai" system—i. e., after being pulled, it is dried in the field, and then stacked up till the following spring, after which it can be used as required for market. When taken from the stack, the boon is separated from the flax by Davy's machine. The boon usually considered refuse, or waste, is then ground into meal, under the first head of the invention, mixed with linseed, boiled in water, and formed into cakes similar in size and shape to oilcakes, and used in the same manner as they are, for feeding cattle. The patentees believe that ordinary millstones are the best adapted for grinding the boon into meal; and, when found servicable, other substances than those mentioned may be mixed in the compound.

The second part of the project consists of treating the fibrous part of the flax-plant with fuller's-earth. For this purpose, the flax is subjected to the action of water impregnated or combined with this well-known bleaching substance and with steam, and then boiled in water. During this latter process, it is alternately closely pressed together, and allowed to expand. The water being now drawn off, the flax is allowed to stand for a time under pressure, after which it is passed between pressing and crimping-rollers, the process finishing with pressing-rollers, for the purpose of removing the effects of crimping. During these pressing and

crimping processes, the rollers are wiped by felts or cloths. The flax is then ready to be sent to the hackler.

Two kinds of machinery and apparatus are required for effecting these results, under the second head—the former for steeping and boiling, and the latter for pressing and crimping. Both deserve notice.

The first consists of two rectangular vessels, or vats, the one within the other, an open space being between them, for the admission and removal of water and steam. The interior one has a perforated bottom, and into it the flax is placed for being operated upon by the bleaching-water and steam. Above the flax is a compressor, or, as it has technically been termed, a "follower," worked by means of screws, and the necessary machinery in framing over the inner vessel. Between the two vessels pipes for the steam run along both sides and bottom of the interior one for heating the water.

From this description of the apparatus the details of the *modus operandi* may be thus stated: The flax is first put into the vessel, and the follower placed above it. Water is then poured into the empty space between the two vessels until it rises up to the follower through the perforated bottom. Steam is next turned on to heat the water, which is gradually done, raising it to 100° Fahr., at which temperature it is kept until the epidermis of the fibre separates, and as much of the colouring matter and albumen are extracted as such will effect. The water is kept at this temperature by a fresh supply mixed with fullers' earth flowing in at one side, while the dirty water is discharged at the other by the over-flow pipes—thus keeping-up a washing and bleaching process until the outer-skin of the fibre comes off easily by drawing a portion of it through the fingers. When this result has been obtained, the fibres, of course, are boiled up in the liquid. The boiling is accomplished by admitting steam to flow more freely into the lower part of the vessel. During the boiling the follower is kept alternately moving up and down, while a flow of clean water is permitted to run into the vat at the bottom, causing an overflow which carries into the waste pipe all the gummy and other matters pressed-out from the fibres, so that they are not allowed to absorb the impurities again, which they would do were they allowed to remain in the vat. Fine flax fibres do not require boiling, and the temperature need not be raised higher than 130° Fahr.—applying the pressure as it rises to 150° Fahr. After the mass is sufficiently boiled and washed, the water is drawn off—the follower screwed down upon the flax, expressing therefrom the principal portion of the water remaining; and in this compressed state it (the flax) is kept for four hours or more to soften, after which it is ready for the pressing and crushing rollers.

The machinery for this second process is more simple, consisting of five pairs of rollers in a frame, with the necessary gearing to give them motion. Two of these—a pair at each end—are plain for pressing, and the other three pairs fluted for crimping. The flax is fed in to the first pair, and passing on through the second, third, and fourth pairs, comes out from the fifth ready for the hackler.

Such is a very condensed review of the Messrs. Burton and Pye's proposition. The idea of working up the whole of the flax plant into food and clothing is certainly a laudable one; and we hope the project before us, which has this for its object, will meet with what it merits—a most rigid experimental investigation at the hands of flax growers. The samples both of food and flax in every stage of their manufacture were promising in a very high degree. The quantity of fine flax, and the almost entire want of waste tow, require special notice. In point of fact, it may justly be said that the whole goes to the hackler as fine flax, the quantity of tow is so

extremely small. Another consideration also deserves special notice in connexion with the manufacture, for the manufacturer has entire control over the article, being manufactured at any stage of the process; thus ensuring, with proper attention, uniformity of quality—a result which cannot fail to be duly appreciated both in the flax market and subsequent stages of manufacture, as in the spinning and weaving. It was otherwise under the old processes of fermentation and maceration, especially the former; for under it, it was hardly possible to preserve uniformity of quality in the process of retting, fermentation being greater in one place than in another. Now every farmer who has any experience here, must be aware how largely a difference of fermentation adds to the quantity of waste tow, diminishing in a still greater degree the quantity of fine flax. Retting, grassing, and scutching are three distinctive processes, all of which are

avoided by the combination of the systems of Davy, Burton, and Pye. In one respect it falls short of Mr. Watt's process, for in the latter the nutritive matter contained in the steep-water was economized for food, whereas in the former it is lost. A question, therefore, may arise as to whether Watt's process should or should not be added to the combination, and this extractive matter drawn off by steam prior to the admission of water containing fullers' earth. In this liquid from time to time drawn off in Watt's process, the linseed could be boiled, thus making a richer cake for cattle. We throw out this suggestion not by way of finding fault, but, if possible, to advance the interest of the exhibitors. The practical question at issue is probably one of expense, and they are the best qualified to answer this by having recourse to experiment.

### THE DRAINAGE OF LAND AT HINXWORTH.

The works of draining executed by Mr. Bailey Denton, on the estate of Robert Clutterbuck, Esq., at Hinxworth, Herts, were inspected on Saturday last by a party of agriculturists interested in this important subject.

Between 30 and 40 gentlemen were present, including Mr. Francis Pym, the Hon. Capt. Cust, Mr. Harrell, Col. O'Duncombe, M.P., Major Wilkinson, Mr. Bidwell, Mr. Bullock Webster, Mr. Corbet, Mr. St. Quintin, Mr. Morton (of Rugby), Mr. J. N. Foster, the Rev. G. B. Blomfield, Mr. Veasey, Mr. Proctor, Mr. Simpson, Mr. Swift, &c., &c.

The Hinxworth estate lies at the junction of the lower chalk formation with the gault of the greensand. It embraces a considerable portion of mixed porous soil and of stiff gault-clay. The whole was surcharged with water; the former by the outflowing of the water, which, having travelled through the higher chalk region, saturates its lower bed, and the latter by its own naturally absorbent and retentive nature. To effect the perfect and economical drainage of soil, differing so much in character though all equally wet, it was determined to adopt "occasional" drainage—*i. e.*, few and distant drains—for the porous soils, and appropriately close—*i. e.*, the gridiron drainage—for the clay soils.

The extent of land already drained at Hinxworth is 672 A. O. R. 30 P., at an actual cost of £2,674 9s. 10d., which is rather less than £4 per acre. The "occasional" work has cost from £1 15s. 6d. to £3 9s. per acre; the "gridiron" from £4 18s. 6d. to £6 13s. 6d. In the former case some half-dozen drains from 4½ to 7½ feet deep have frequently drained twice as many acres, while in the latter the drains have nearly uniformly been placed 25 feet apart. Mr. Denton showed by a map the position of every drain on the estate, and the line of demarcation between the geological formations referred to was clearly indicated by the different modes of draining the distinctive soils. Thus a glance at the map showed the observer where the green sand outcropped, separating the lower chalk from the gault. It is on this margin that Mr. Denton is raising coprolites in quantity about 250 tons to the acre. These works are quite worth a visit, independently of the drainage.

Mr. Denton has proved the effect of his two modes of draining by a series of observations, commencing on the 1st of October last. These observations, besides giving the daily rainfall and discharge from the drains, include a daily record of the water standing in muddy test-holes dug midway between the drains both in the "occasional" and the "gridiron" work. It is thereby shown that the few drains in the one case and the numerous drains in the other have a like effect in lowering the water in the soil to an ordinary *minimum* depth of 4 feet from the surface. The observations show, however, that the water will rise in all the holes after a fall of rain, and gradually sink with a sympathetic regularity. On Saturday last the test-holes on the drained land showed that the water standing in the soil was on a level with the drains, except in the instance of the most recently drained land, in which the water stood six inches above the drains. In the adjacent undrained land—both the mixed porous soil and gault—the water was stand-

ing, in similar test-holes, within 18 inches of the surface. To judge of the heavier soil the drainer has here had to contend with, and the importance of their improved condition by drainage, we should mention that Professor Way having analyzed several specimens of the gault has shown the proportion of clay (agricultural) to vary from 43 to 63 per cent. A large proportion of carbonate of lime exists, varying from 30 to 35 per cent., which of course favours the passage of water through the soil, and will help to maintain its future disintegration. Mr. Denton's recorded observations show with what rapidity the rain falling on the surface finds its way out of clay soil, by the drains. He gave the following instances. The clay land outlets began to run on the 27th Nov. On Dec. 12th, the outlets were running 3½ gallons per minute; on the 13th they ran 19½ gallons per minute, after a fall of rain of nearly half an inch on the previous day. In January, which was a wet month, and the tubes and pores of the soil were filled, the increase of discharge, resulting from a heavy fall of rain, was much greater. For instance, on the 9th, the outlets were running steadily 3 gallons per minute, and on the 10th, after a rain of more than half an inch, they suddenly increased to above 100 gallons per minute. The land in question had been drained twelve months.

But the most remarkable fact Mr. Denton has recorded, in corroboration of opinions he has before expressed, is that, without any fall of rain on the surface of these clay lands, the outlets have been found to increase their discharge. At such periods of increased discharge, it has been clearly demonstrated that the barometer has suddenly fallen. For instance, Mr. Denton shows that, on the 6th March, after several days without rain, the outlets throughout the estate increased their discharge from 110 gallons per acre *per diem* to 150 gallons; and on that day the barometer exhibited a remarkable fall. These observations require corroboration by repeated instances; and they will afford a singular proof of the sensitive nature of clays 4 feet below the surface.

On the point of temperature of soils, drained and undrained, Mr. Denton's tables also show a remarkable fact, although practically there may be but little value in it. It is this, that whereas the undrained land in January exhibited a temperature as low as 30 degrees at 18 inches below the surface, the drained land never reached so low as freezing point at the same depth, although the temperature of the air above was recorded at 16 degrees below freezing point.

The work was generally pronounced to be particularly well done, while the improvement to the estate promises to be extraordinary. There was, of course, the customary discussion as to the depth really requisite, Mr. Bullock Webster heading an opposition, who still consider three feet in many districts quite enough, Mr. Denton being as determined for nothing under four.

There will be another open day on Saturday next, and considering how easily accessible Hinxworth is, we should recommend all who can spare the time to make so instructive an inspection,

## APPLICATION OF THE SEWERAGE OF TOWNS TO AGRICULTURAL PURPOSES.

BY MR. JAS. D. FERGUSON.

A meeting of the Newcastle-upon-Tyne Farmers' Club was held on the 7th March, 1857, at the Library of the Club, in the Literary and Philosophical Society's Buildings, in Westgate-street, when there was a considerable attendance of members, including Mr. G. H. Ramsay, Mr. Amos, Mr. Dunn, Mr. Chrisp, Mr. Glenton, Mr. Robert Ormston, Mr. Dobson, Mr. J. D. Ferguson, Mr. James Bell, Mr. W. Bell, Mr. Weeks, Mr. Glover, &c., &c. Mr. Ramsay was called to the chair, and said they had met to hear a paper from Mr. Ferguson on the application of the sewage water of towns to agricultural purposes, with reference more especially to that town, and he had no doubt it would be well worthy their attention.

Mr. J. D. Ferguson was then introduced by the Chairman, and read the following paper:—

Mr. Chairman and Gentlemen: In appearing before you for the first time at this club, of which I have lately become a member, I fear it may be thought presumptuous in me to address you on a subject so comprehensive and important as the application of the sewage water of towns, particularly that of Newcastle, to agricultural purposes. Having, however, the pleasure of being acquainted with your respected secretary, he some time ago paid me the compliment of asking me to write a paper on that subject, and, believing that I would have some spare time on my hands, I readily complied with his request. As this matter, gentlemen, is not new to me, I shall, in addressing you, do myself the honour of stating, first, the effect of various experiments which have been made by, and plans which are proposed for, the application of liquid manure, and then point out the method which, in my opinion, might be adopted of applying for agricultural purposes the sewage water of Newcastle. In respect to the drainage of farm steadings, on which I may be permitted to say a word, and applying it to the soil, I have had ample practical experience. I have also often seen, and thoroughly understand, all the plans which have been adopted for irrigation introduced on some farms in Ayrshire, and also on a large farm near Glasgow, by the application of manure in a liquid state; and the effect on the various crops, but particularly on grass lands, was certainly wonderful in all. I myself made several experiments about nine years ago, on a farm near Glasgow, to prove the value of the drainage of a farm steading, which was chiefly composed of the washings of dung-heaps and urine of cows, &c.; and having written a paper on the subject, which I sent to the committee of the Highland and Agricultural Society in Edinburgh, they thought it of so much importance at the time, that they awarded me their gold medal, and the paper was afterwards published in the "Quarterly Journal of Agriculture." We have also abundance of evidence on the continent of the astonishing effect on all kinds of crops by the application of liquid manure. In Holland and Flanders they are fertilizing every year many hundreds of acres of poor worthless soil, which after a time produce the most astonishing crops of all kinds of corn and potatoes. Even the poor labouring men in that country so thoroughly appreciate manure in a liquid state, that if one can keep a cow, and rent, as some of them do, three or four acres of

land, he every morning is seen collecting, with the utmost rare, the urine of his cow, and the night urine of his family, putting both into a small cask, and, filling it up with water, slings it on his back, which he carries to his little field, and irrigates with the utmost patience, day by day, and piece by piece, his scanty crop by a small hose, which is fixed to and hangs from the cask. Mr. Mechi, too, an excellent authority on this subject, and who has done an immense deal for agriculture, has made his farm of Tiptree, which formerly was worth little more than 10s. or 12s. per acre per annum, now produce, by the liberal application of liquid manure on the Ayrshire system, as good crops as can be seen on the best land in England. It is not necessary, I apprehend, to give details of the various methods adopted for applying to the soil the drainage of farm steadings. These, with the results, have been stated again and again in several publications, particularly in the "Journal of the Royal Agricultural Society," and in the "Edinburgh Quarterly Journal of Agriculture," and to those periodicals I beg respectfully to refer you. Now, when we know that the drainage of farm steadings (which is almost wholly disregarded by farmers) is so valuable as food for plants when applied to the soil, we cannot be surprised at the fact of the much greater value of the sewage water of towns, which consist chiefly of the exuvie of the inhabitants. Every person is aware that an immense sum is paid every year by this country for guano, which is gradually getting more expensive, while, at the same time, an incalculable loss is sustained at our very doors, by the total neglect of a manure equally valuable, and which in almost every city and town is allowed to run to waste into the nearest river or stream in the neighbourhood, in place of some means being adopted of applying it to the soil. This subject has more or less engaged my attention for the last ten or twelve years, and the more I have reflected on the immense national loss this country sustains by the total disregard of the sewage water of towns, the more I am convinced of the general practicability of applying it. The question then arises, how is that to be done in the best and most economical manner? Is it by forcing the sewage through pipes, and then throwing it over the soil? or should it be precipitated and deodorized as is done at Leicester, and proposed at other places, and the deposit or silt (which, in truth, is often little else than the detritus of streets) sold to farmers for manure? These are questions of no little importance, and I shall venture to offer my opinion on both systems. Several years ago, when I practised in Glasgow as an agricultural engineer, I took considerable interest in this matter, and was most anxious to get up a company to carry this important improvement in respect to agriculture into effect, by introducing the system of forcing by the power of steam-engines the sewage water through pipes to a considerable distance, and then distributing it over the land by hose and jet. I found, however, very great difficulty in convincing people, particularly commercial gentlemen, who could not be expected to have much practical knowledge on the subject, of the great value of the sewage water of towns, and therefore the scheme of getting up a company at that time was aban-

done. Being, however, somewhat enthusiastic in the matter, and believing that one day or other the subject would be taken up and carried into effect, I proposed to one or two of my friends (being anxious to show to commercial gentlemen especially, by ocular proof, the great value of sewage water) to join me in taking a small farm in the neighbourhood, on which to make experiments. I proposed, after getting the farm made dry by drainage, to manure the fields with nothing but the sewage water from one or two of the city sewers, which was to be carted out every day by water carts. It was to be carefully analyzed once or twice every week, the quantity put on each acre accurately ascertained, the expense per acre, the quantity of corn, &c., sown and reaped, and a correct statement and price of every crop made up at the end of each year; for it was proposed that the farm should be thoroughly cropped for several years before any statement was made public. I am sorry to say, however, that I found my friends to whom I proposed my scheme somewhat sceptical on the subject, for the matter was at that time comparatively new; and having soon thereafter obtained an appointment in this part of the country, the proposition was abandoned, and I have not heard that any experiments were made, or that it has been carried out by any one. In all likelihood I would have experimented myself; but being often engaged and from home, I found that a careful interested person was necessary to superintend these experiments in my absence, and at any rate, in making my calculations, I ascertained that the cartage of the sewage water about two miles into the country in sufficient quantity every day, by five or six water-carts, would have been a serious item of expense, and therefore the scheme was given up. It is worthy of consideration whether or not some such experiment should not be tried here, if doubts are entertained by any one of the value of the sewage water. For a Farmers' Club, the subject I think would be a proper one to encourage, and, in the minds of such persons, would set the matter at rest. With reference to the application of the sewage water of Newcastle to agricultural purposes, in respect to which I have lately been taking a narrow survey, I can see no engineering difficulties whatever but what might be overcome by a spirited public company, because without commercial enterprise the scheme could not be properly carried into effect, as the expense which would necessarily be incurred would be far beyond what any private company or corporation would be willing in which to engage. Before I state my views, however, on this subject in respect to Newcastle, I shall mention some plans and experiments which have been carried out at other places, as well as the method which was proposed ten or twelve years ago in London, of applying part of the sewage water of that city to agricultural purposes. At Edinburgh the sewage water, but in a very concentrated form, is used extensively; and land on the sea-side, which I have seen and travelled over, and formerly was almost worthless, being rented at no more than 3s. or 4s. per acre, now lets at £20 and £30 per acre, and upwards, in consequence of part of the drainage of the city flowing by gravitation over the grass lands. This land is let in portions to the cow-keepers, and it is not uncommon for them to cut the grass six and seven times in one season. In the neighbourhood of Stirling, the late Mr. Smith, of Deanston, tried an experiment with the sewage water of the town. He laid out portions of land of a light loamy soil in equal divisions. The first portion he manured with ashes and farm-yard dung at the rate of twelve tons per acre, which cost 48s. The second portion was done with

compost at sixteen tons per acre, which cost 64s. The third division was manured with two cwt. of guano, which cost 16s. A fourth division with four cwt. of guano, which cost 32s.; and a fifth division was manured with sewage water alone, at the rate of sixteen tons per acre, which, if calculated at 4d. per ton, the expense would be 5s. 4d. The average produce of the first four divisions manured with farm-yard dung, compost, and guano, was at the rate of forty-six bushels per acre of marketable barley. The division dressed with the sewage water alone produced nearly forty-three bushels per acre; and although this division was manured twice with the same quantity (*i. e.*, sixteen tons per acre) which cost little more than 10s., yet the produce was nearly as much as the others at three and four times the cost. At Clitheroe, in Lancashire, Mr. Thomson was induced to try the effect of the sewage water of the village, mixed with the soap-suds of a bleach work in the neighbourhood, on some of his pasture land. He also tried three cwt. of guano; and the divisions being of equal extent, he found on the portion dressed with the sewage very nearly double the quantity of grass than that done by guano. It has been proved that the night urine of two adult persons, mixed with ashes to make it applicable, is sufficient for an acre of land; for an experiment having been tried, it was found, on making the calculation for one year, that one acre would produce 27 tons of turnips, while 4 cwt. of guano applied to the same quantity of land would produce only one ton more, or 28 tons. At the town of Mansfield, the population of which is about 10 or 12,000 inhabitants, very extensive experiments were made some years ago by the late Duke of Portland, and the results were wonderful, as land in the neighbourhood of that town which at one time would not let for more than 5s. or 6s. per acre per annum, now lets at from £12 to £14 per acre, in consequence of the sewage water being diverted by gravitation over the grass lands. About 12 or 13 years ago a company of gentlemen made application to Parliament for a bill to enable them to apply part of the sewage of the city of London to agricultural purposes. Their plan was, I believe, to make a tank or well on the side of the Thames, into which one or two of the principal sewers at the west end of the city were to be discharged. At the side of this tank a powerful steam-engine was to be erected, to force the sewage over a building of considerable elevation, to obtain sufficient altitudinal pressure, so that it would flow ten or twelve miles into the country, along a horizontal main pipe. From this main pipe branch pipes were to be laid in all directions, from which the farms and market-gardens were to be irrigated. A great deal of valuable evidence was collected from some of the most able chemists, engineers, and agriculturists of the day, in reference to this scheme; and as the bill was favourably reported upon and recommended by a select committee of the House of Commons, it was thought, in consequence, that there would be little difficulty in obtaining an act of Parliament to carry it into effect, although, at the time, considerable opposition interposed; but in 1846 and 1847 the extreme panic in the money market completely paralyzed the company; and, there being great difficulty to get gentlemen to go on with the undertaking, the whole thing was abandoned; and, I believe, nothing further has been done. Various schemes are, however, again in agitation in respect to this matter, some gentlemen proposing to carry sewers parallel with, and on each side of, the Thames, to the sea, and there discharge the whole sewage-water of the city of London. Others propose to carry it only fifteen miles

down, and then discharge it into the river; while others, again, maintain that, in a sanitary point of view, the whole sewage ought to be precipitated, and the refuse or insoluble matter dried, and then sold to farmers as manure, the liquid, after precipitation, being allowed again to flow into the river. The two first schemes will not, likely, ever be carried into effect, being scarcely practicable, unless the sewage is used at intervals of every three or four miles, for agricultural purposes; and this could be easily done, by allowing the liquid to flow into large tanks at these places, and then, by the force of powerful steam-engines, carry it in pipes to a distance, and then throw it over the surface. This plan would, no doubt, considerably lessen the expense of such an undertaking, as from 2d. to 3d. per ton would cheerfully be paid by farmers for such manuring, and, consequently, a much lower rate (if, indeed, a rate would be necessary) would suffice to defray the expense in carrying out the scheme. To the precipitating process alone, I fear, great opposition would speedily spring up, because, as it is believed very little profit would arise from the sale of the refuse, a heavy rate would have to be levied to cover the expense of the process. Lately, a Treasury Commission has been issued, appointing several scientific gentlemen to investigate this important matter, and to report on the best means of applying the sewage of towns to beneficial purposes. It may, however, be some months before they make up their report, which, no doubt, will be valuable, when it appears; but, in the meantime, we may form our own opinion on the subject. I can scarcely believe that they will recommend the method by precipitation, unless combined with the irrigating process—*i. e.*, precipitating and deodorizing what may not be wanted by farmers; and this method is what, in my opinion, ought generally to be encouraged and adopted, because, in the end, it would not only be a profitable speculation, but would be equally good, in a sanitary point of view, as if the whole were precipitated and deodorized, as it is done by Mr. Wicksted, at Leicester. In respect to the value of the solid part as manure, there are various opinions, some maintaining that it is worth from 30s. to £2 per ton, while others, again, state that its value is not more than 10s. or 12s. per ton at the works, the process of drying, to make it portable, after being removed from the tanks in a state of sludge, being an expensive undertaking. Professor Anderson, the able chemist of the Highland and Agricultural Society of Scotland, says, after a most careful analysis of some of the Edinburgh sewers, that "little more than one-sixth of the whole value is contained in the insoluble parts of the sewage, the other five-sixths existing in solution; and it is, therefore, obvious that, unless the plans by which the sewerage-water is to be rendered available make use of that part which exists in solution, they must be of little value; and a very little consideration will enable us to see that it is exactly in this respect that all the plans for converting it into a dry and portable manure are defective." He also says, in another place, that "*ammonia*, the most valuable constituent of a manure, cannot be precipitated by any process whatever, except such as are altogether precluded by their expense: still, new patents are constantly being taken for doing *what is impossible*." The same gentleman alludes to the subject again in another paper, in these words: "I have seen no reason to alter the opinion expressed in a previous number—that, if sewage is to be employed at all, it must be used *in toto as liquid manure*." Professor Way, the distinguished chemist of the Royal English Agricultural Society,

confirms the above in every particular, proving, without the shadow of a doubt, that the insoluble or solid part of the sewage of towns is of little value, when compared with the supernatant water, or what is held in solution; and he says, in an essay recently published by him: "in neglecting the liquid, we lose by far the largest proportion of manuring matter; and I think it possible to show that the collection of the solid matter will not, at the price which the product is agriculturally worth, be a *paying speculation*." A Mr. Oliver, a noted farmer near Edinburgh, who tried the solid manure of the sewage as an experiment, after being precipitated, wrote to Dr. Granville in London, some years ago, these words: "I care nothing for the solid—I would not give a fig for all they could give me in Edinburgh; but the water containing the soluble parts is of great value." These are opinions from disinterested parties, founded on facts, and which ought to carry conviction to the most sceptical mind. In respect to Newcastle, on which I now venture to give my opinion, the all-important question arises, How is this manure, which is proved so valuable, to be applied to the soil in an economical manner, in place of polluting, as it does at present, the finest river in the north of England? Had there been a tract of country within moderate distance, on a lower level than the outlet of the sewers, then the application of the sewage-water to the soil, by gravitation, would have been a simple and an easy matter; but the district to be irrigated being on a higher level, it is obvious that mechanical means must be used before the sewage-water can be applied to agricultural purposes. In this, however, I do not apprehend there would be any insurmountable difficulties to encounter. The town, which is exceedingly well situated for house-drainage, is built on a steep, sloping bank, on the N.W. of the Tyne, and at present, it is understood, contains a population of about 90,000 inhabitants; the houses and streets occupying an area, exclusive of the suburbs, of about 860 acres. From this area there will be an annual average flow of sewage-water to the Tyne of nearly 3,000,000 tons, taking London as a guide for my calculation; for it was proved some years ago, by the surveyor of the commissioners of sewers of that city, that, from a population of about 175,000 inhabitants, and an area of 1,753 acres, where the streets are wide, nearly 6,000,000 tons of sewage, including land-drainage, were annually discharged into the Thames. Many of the houses, however, in Newcastle may not as yet have the convenience of water-closets, though these will be gradually increased; and, therefore, looking at the drainage of part of London, I compute the quantity yearly of sewage discharged into the Tyne at only 2,000,000 tons, irrespective of the water used for public works, &c., and which (if this scheme was carried out) ought to be conveyed direct to the Tyne, in drains made for the purpose. This quantity of sewage, I shall show by-and-by, will suffice for thoroughly manuring 13,000 acres of land. From the careful survey which I have lately taken, I am of opinion that this immense quantity of sewage of the town ought to be conveyed to one place; and one feasible method only presents itself of doing it, and that is, by intercepting the sewers near their outlet, by making a large main sewer parallel with, and at ten or twenty yards from, the river, as may be practicable, into which all the others would flow. At present there are eight large sewers, made and to make, which flow into the Tyne, and no less than twenty small ones; and in order that these might be intercepted, I would begin with the head or upper end of

the main sewer, at a point five hundred yards above the Shot-tower, lead it down the street called "The Close," and past the back or south side of the Town's Hall, then down the Quay to a point about two hundred and fifty yards below the confluence of the Ouseburn with the Tyne. There, three large tanks ought to be made, into which this main sewer, which would be three thousand five hundred yards in length, would discharge itself; and at this place a powerful steam-engine would require to be erected, for the purpose of lifting or pumping the sewage up the bank, along an iron pipe, which would be laid under the surface, and which would lead up to Byker Hill. That knoll (only 1,270 yards from the tanks), though of considerable elevation, is not of sufficient altitude to command the district northwards; and therefore the windmill building at that place, which is about fifty or sixty feet in height, and which would answer the purpose admirably, would be bought, on two sides of which pipes of the same size as the main pipe would be fixed. The sewage would be forced up one pipe into a small tank at the top, and then, by its own gravitation, flow down the other, so that sufficient head-pressure would be obtained to deliver it by jet six miles to the north of Newcastle, and, by small pipes diverging right and left, upwards of two miles on each side of the Newcastle and Berwick Railway, along one side of which the main pipe might be laid. The small tank on the top of the windmill-tower would be provided with an overflow-pipe, leading to a waste-pipe, so that, when the sewage was not drawn away, it would flow down into the tanks below, in which there would be sufficient sluices, so that in the time of heavy rains the sewage, when too much diluted, would be made to flow into the river. By this plan, there would at times be considerable waste when the sewage was not freely drawn away, or when repairs were necessary; but that could not be provided against, unless a large reservoir on Byker Hill were made, with an auxiliary engine, to keep the pipes always charged. This certainly would be a great advantage, and would be exceedingly desirable; but, unless arched over, it might be considered a nuisance by the inhabitants in that neighbourhood, and, moreover, would entail considerable additional expense. The distance of six miles into the country, by upwards of four broad, would comprehend an extent of twenty-five square miles, which would be fully more than sufficient to consume all the sewage of Newcastle, according to the present population, allowing annually two hundred tons, in which there would be about eight cwt. of rich manuring matter, to each acre of arable land; but the pipes would be so laid that they could afterwards, when the population increased, be extended to a greater distance. On the service-pipes hydrants or stop-cocks would be fixed, at suitable places, by which the fields could be irrigated by hose and jet; and the tanks would be made in such a way that, at night, when the engine was not going, they would be filled in succession. The first, when full, would overflow into the second; and the second, in like manner, into the third. If the precipitating and deodorizing process was introduced, this method, in conjunction with the irrigating system, would allow one tank to be emptied of its deposit while the others were in use. In the sewage-water of towns there is often a good deal of what I may call brick-bats, as well as flocculent matter, which would be screened or intercepted by vertical gratings, in its way to the tanks, and that would be taken into the company's works (which would be built at the place), and partially dried, and

afterwards put into small vessels on the river, and sent to various places, for sale as manure. From the careful inspection I have made of the country to the north of Byker Hill, and the general equality and flatness of the surface, there would be very little friction in the pipes by the flow of the sewage along them, and, therefore, less fear of derangement and fracture of the pipes than if they were laid in a surface more undulating. For such a scheme as this, the assent and co-operation of the proprietors and farmers of the district proposed to be irrigated would be necessary before anything was done; but there is scarcely a doubt that all would be willing to take a liberal supply at, say at least 2d. or 2½d. per ton; the soil, which is generally of a clayey nature, being very suitable for it; for Professor Way says "that clay soil has the power to remove from solution almost every ingredient which is of any value in agriculture, and the soil, when fully charged with the soluble ingredients of sewage, would, of course, be extremely rich for all purposes of vegetation." I apprehend, therefore, the farmers would soon find it was not only the best, but cheapest manure at that price they could purchase, provided the soil on which it was used was in a dry state. If the gentlemen appointed by the Treasury to report on the best means of applying the sewage of towns to agricultural purposes, recommend the precipitating and deodorizing process alone, in preference to any other method, and in the event of an Act of Parliament being obtained for the sanitary improvement of towns, a heavy rate in many places would require to be levied from the inhabitants, to bear part, if not the whole, of the necessary expense incident to such a plan; and, consequently, opposition to such a bill might be anticipated, for it would appear that from the comparative little value of the solid manure, scarcely any profit would arise from its sale, whereas if the sewage is used in a *liquid form*, the very reverse would be the case, for Professor Way, whom I am glad again to quote, states—"I do not doubt that if the liquid sewage could be properly distributed over the extent of surface which it is capable of fertilizing, a *revenue would be forthcoming towards the reduction of the town rates.*" I am of opinion, however, there could be no difficulty in carrying on both plans simultaneously, by having sufficient works at the place, so that at times the sewage which might not be wanted by the farmers, particularly during the time of snow, might be precipitated and deodorized, and afterwards sold as manure at what it would bring. It is said that this fertilizing but neglected manure, when thrown over the surface, is intolerable from the effluvia which arises from it. This, however, is a very serious mistake, for it is a well-known fact that common farm dung, when laid upon the soil, emits a much more unpleasant odour, and that the sewage of towns, if sufficiently diluted, is not nearly so permanent, as it soon sinks into the soil, which is an excellent deodorizer, and becomes evanescent in a short time. Great objections have often been made to various obstructions in the Tyne, which partially prevent the salmon from getting up to the spawning beds; but we may rest assured that if Newcastle and Gateshead together progress in population and public works in the same ratio for the next thirty or forty years as they have done during that period, the sewage water of both, all the while, running into and polluting the river, we may be certain that not a single salmon or fish of any kind would swim in it, for it would then, when the tides are low, be often little better than a great black ditch churned to and fro by the constant and increasing traffic of steamers, and would be perfectly poisonous to all kinds of fish, as well as



suffocating to the unfortunate inhabitants living on its banks, and compelled to breathe noxious emanations arising from the *debris* left by the tides. Gentlemen, any estimate that I can give of the probable expense which would be incurred by this undertaking must be understood as only an approximation, for without an actual survey and proper plans and specifications it would be scarcely possible to arrive at an exact estimate. The following, however, which I have taken every pains to obtain, may not be far from the truth, viz. :—

Main sewer parallel with the Tyne, 3,500 yards in length, including slight alteration of the present sewers which would flow into it, at £4 per yard at an average .....	£14,000
Three large tanks, each 45 feet in diameter and 40 feet deep, at £1,300 each.....	3,900
Houses, sheds, and works.....	2,300
Steam engines, boilers, and pumps .....	3,100
Windmill tower on Byker Hill for stand pipes, with alterations .....	1,000
Main and distributing pipes, &c , say.....	37,000
Land and house property to be bought, act of Parliament, &c., say .....	5,000
Contingent charges at 5 per cent .....	3,215
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	£69,615

The above is a large sum ; but, I believe, this extensive scheme could not be carried out for less, especially when we consider that proprietors and farmers to the north of the town, occupying an extent of nearly 25 square miles or 16,000 acres, would have the advantage of getting their land liberally dressed with this valuable and fertilizing manure. From that extent, however, I deduct 8,000 acres, which, I assume, may be occupied by plantations and roads, &c., leaving 13,000 acres for the sewage manure ; and suppose each occupier took only, at an average, 200 tons per acre annually for his land and to throw over his dung heaps (that being scarcely one-half which Mr. Smith, of Deanston, reckoned sufficient for grass lands), and calculating that quantity at only 2d. per ton, there would arise the yearly revenue of upwards of £21,600, and that without taking into account the value of the silt or solid manure, which, I assume, may be equivalent in price to the yearly waste of the sewage. The yearly working expenses, however, must be deducted from the above sum, as well as 4 per cent. on the capital. These I estimate as follows, viz. :—

Amount of yearly revenue as above.....	£21,600
Steam engine, fuel, &c. ....	£2,120
General repairs, &c.....	1,700
Attendance and management.....	3,300
Depreciation of works, pipes, and hoses, &c.....	2,200
Rates and taxes, &c. ....	1,200
4 per cent. interest on £69,615 .....	2,784
	<hr/>
	13,304
	<hr/>
	£8,296

It appears, therefore, that the sum of £8,296 would be the clear yearly revenue which would arise from this scheme, which is upwards of 11½ per cent. on the capital, and which by good management I have no doubt after a time might be realized. Were such a project carried into effect, the advantage to the town in a sanitary point of view, and to agriculture, would be reciprocal ; for while the river would be relieved of a great deal of offensive matter which flows into it, and the town made more healthy for the inhabitants, a large district of country in the neighbourhood would be made to yield probably more than double the quantity of produce than it does at present, particularly of grass, sev-

eral heavy cuttings of which might be obtained in one season, and for that in the large and populous towns of Newcastle and Gateshead there will always be a great demand. Like every improvement comparatively new, there would no doubt be many difficulties to encounter and overcome in carrying out such an important scheme as this. One of the greatest would be, to induce the farmers to appreciate and use the sewage freely, which at first many might be scrupulous to do, but were a few of the most enterprising in the different districts to get it without cost for the first year, the whole would very soon find it to be their interest to use it extensively for *every crop*, although many for a time might suppose that the half quantity per acre which I have named would suffice. In the neighbourhood of London, proprietors, farmers, and market gardeners, occupying about 25,000 acres in extent, agreed generally some years ago to take part of the city sewage at 2d. and 3d. per ton ; and the farmers here, who are I believe no less intelligent and enterprising, would I have no doubt very soon appreciate such valuable manure, delivered to them at such a price, and that without any trouble or care. Permit me now, gentlemen, to offer you my sincere thanks for the kind and patient attention you have given me, while stating my views on this important subject.

Mr. Ferguson resumed his seat amid much applause.

The CHAIRMAN having invited discussion on the paper,

Mr. DUNN said he had turned his attention to this subject, but with a different object, and it had reference more especially to the sewage of London. His object was to cleanse the sewers by supplying them with water to take away their contents, so as to prevent them filling up and becoming a nuisance in dry or warm weather. He described the mode of proceeding which he had suggested, and then proceeded to observe that he quite agreed with Mr. Ferguson that if the sewage could be applied to land in a liquid state it would be a great advantage. One of the difficulties would be that it would be constantly altering its condition between wet and dry weather ; but no doubt valuable and fertilizing substances were contained in it.

Mr. Dobson said he had looked through Mr. Ferguson's calculations, and considered them extremely able, and the estimates very correct. He saw no engineering difficulties in the way whatever, and if a company of sufficient enterprise could be formed to get up the scheme, he had every reason to believe it would pay. But this morning he had taken some consideration about the levels of the town, and it appeared to him that Mr. Ferguson's plan might be improved by an addition being made to it in this way. Take the level of Neville-street, and the sewage from that part of the town above it might be conveyed by the side of the railway to Shields and Morpeth, and save a great deal of piping ; this, it struck him, would improve Mr. Ferguson's plan materially, and the sewage thus taken down could only be applied in the form of irrigation. They could not use the jet and hose here. He suggested that Mr. Ferguson should take this feature into consideration, and he considered that, if it were adopted, the scheme would be more likely to succeed. He saw no difficulty in it whatever. And by not taking the sewage above the level of Neville-street down by the main pipe, it would save a great deal of pumping, as the sewage above would be conveyed down by railway through pipes. This addition to Mr. Ferguson's scheme was well worth consideration. He thought if it were gone into carefully it might be done. He would not advise Mr. Ferguson to be disheartened by the cost, for he thought it would be a payable undertaking if it were properly gone into.

The CHAIRMAN—Eleven-and-a-half per cent. was a very good return.

Mr. DOBSON—Six per cent. would do very well. He did not know whether it would be applicable to tillage as well as for grass lands.

Mr. FERGUSON said that sewage water was applicable for tillage as for other purposes; he had several times seen beautiful crops of turnips and corn produced by its application, no other manure having been applied. Among other purposes, it was a capital thing for flowers, and a great many of the nurseries and market gardeners around London had it carted out.

Mr. DUNN—Had it been tried a good deal at Leicester?

Mr. FERGUSON replied in the affirmative, and said that it was kept there in large tanks.

The CHAIRMAN—The land was irrigated at Rugby by pipes on this system.

Mr. AMOS said he could state from his own personal knowledge that the system of irrigation adopted in Scotland had been found to be the most economical and profitable system yet introduced. He knew that near Edinburgh, on Mr. Oliver's farm there, and also on the Craigmillar estate, the land had risen from a state in which it was worth nothing till they could get £25 to £30 an acre for it. That of itself was quite sufficient to recommend it to the agricultural interest of this county, and if they could get a ton of liquid manure for 2d., or even for 6d., it was a mere nothing for the good that would accrue from it either in tillage or grass.

Mr. WEEKS said that at Ushaw, near Durham, they were making a very large tank to receive the liquid manure from the farmyard and irrigate the land in the way now suggested. One of the professors of the Ushaw University had, he said, been down to Scotland inspecting the system, and was so much pleased with it that he determined immediately to have it at Ushaw.

The CHAIRMAN said he felt pretty certain they would all feel impressed in the same way as himself with Mr. Ferguson's very able paper. He was sure the manner in which it was got up, and the candid way which he told where he had got his information, evidently from the best sources in this country, rendered it additionally reliable. The next question was as to the pounds, shillings, and pence part of the affair. He had no doubt of the soundness of Mr. Ferguson's views, and was quite certain, if anything of the kind could be done, it would be advantageous to the agriculture of the district. At Edinburgh and some other places, some very poor lands had risen in value till the grass crops were

most enormous. He did not know that it was of such quality as they would give to their pet animals, but still it would feed a great deal of the run of animals. There was very little difference of opinion as to the value of this manure among various chemists. Mr. Herapath stated that it was from  $2\frac{1}{2}$  to 3 per cent. more valuable than farmyard dung. His opinion was that where sewage could be applied to land of whatever quality, it was the best plan that could be adopted. To show the importance which was attached to the application of fertilizing manures to land, he cited the prize offered by the Royal Agricultural Society for the best artificial manure as a substitute for guano; but this prize was not to be given unless it could be sold in unlimited quantities at £5 per ton. Now, if any man could discover a manure worth that, he would not go to the Agricultural Society, but would make a hundred thousand pounds in another way, and the Society had to withdraw the prize. But it just showed the enormous extent to which fertilizing manures were applied in the cultivation of the land. He had heard it said that the liquid manure in sewers was so weak that it would not pay to take it out; but there was no doubt that if distributed over the land it would be most valuable. There was no doubt that the paper of Mr. Ferguson would make a sensation, and the club would take care that it should be published. He remarked that the scheme had a sanitary as well as an agricultural bearing, and would enable the country to meet the town half way in a work that would tend to cleanse the town and fertilize the land. For his own part, he felt much obliged to Mr. Ferguson, as they must all, and he would ask them to pass a vote of thanks to him for his valuable paper.

The vote of thanks was carried by acclamation, the Chairman observing that he hoped it would not be the last time they should have such papers from him.

Mr. DUNN—It would be very important to ascertain the difference between the sewage of Newcastle, and that of Edinburgh and London.

The CHAIRMAN—Professor Way had said different parts of London produced different kinds of sewage water.

Mr. FERGUSON observed, with respect to this point, that they should, perhaps, analyze it two or three times a week, so that it might not be conveyed to the farmers in a weak state, and the sluices should be opened to let it run into the river when it was in a weak state, or when it happened to be in a weaker state they could take a lower price. He concluded by acknowledging the vote of thanks, and the Club then separated.

## LIQUEFIED MANURES.

The late discussions at the Central Farmers' Club have awakened a lively interest in our several branches of agriculture, and their prospective future for the fuller development of their resources for an increasing population upon the given acreage of our water-bound lands.

Mr. Thomas has called attention to the over-abundance of straw, produced by excessive manurings and high farming, and asks for a remedy. Mr. Baker has given an able paper on farm and artificial manuring; and subsequently the consideration of extending our modern arts to the wild and unreclaimed waste lands of England has been intro-

duced to general notice by Mr. Smith. These are alike both important and interesting subjects in "progressive England"; but there yet remain many other subjects, amongst them that of "liquefied manures."

The collection, distribution, and fertilizing properties of sewage manures have long engaged attention, and remain *in statu quo*; but the liquefying of portable and artificial manures for root crops, top-dressings of seeds, the purposes of irrigation, &c., requires to be better known by the general public, and at once; that the full benefits of liquefaction may be accepted at this difficult

moment as a part substitute for the short importation and enormous price of Peruvian guano. In saying this we speak advisedly, and feel it a duty we owe to our agricultural friends to remind them of the happy effects produced by liquefied manures.

In speaking of these, let it not be understood that we write upon liquid or sewage manures, but *liquefied* portable agents for the purpose of accelerating the quick and easy growth of our green crops, especially roots. Liquid manure is that class of fertilizer which is collected in tanks, from manure heaps, yards, folds, urine, &c., in a fluid form; while liquefied manures are those which are subjected to a process of liquefaction by water, that they may be so diluted and liquefied as to be applied by a water drill or cart for forcing our plants at the earliest stage of their growth. Water is the cause of fluidity in both, and by this combination they are brought into a soluble state for decomposition, never to be separated but by filtration through the soil, or taken up by the *spongioses* of a plant, in search of food (in a soluble state) for the quick structure of the plant. If this be true—and true it is—how essential, then, to aid this natural process, by liquefying our artificial agents before application to the crop! Superphosphate, guano, nitrate of soda, salt, rotten dung, &c., are all readily dissolved, or divided into minute parts, and held in suspension for the plants. In fact, every portable manure, except long dung and lime, may be so converted and applied in a liquefied form, the bulk of water being regulated by local circumstances.

Since the publication of Professor Way's paper "on the power of soil to absorb manures," no fear need be entertained as to the safety of entrusting our manures to admixture with water. The filtration and separation are complete when applied to the land. The liquid in passing through the soil deposits all minute particles held in suspension, and the land imbibes the qualities that are in solution. By this process, no loss by evaporation takes place, as it is immediately confided to the soil, as a store-room for the plants, to be drawn upon as their subsequent growth shall direct.

We now come to the application of liquefied manures to our root crops. Experience by successive experiments has shown that "water drills" have been mainly instrumental in introducing this new process. These experiments afford a striking proof of the advantage of supplying dissolved manures to the growing turnip plants, especially to push them past the fly.

An extract from Mr. Ruston's report contained in the *Mark Lane Express*, in November last, may again be quoted as evidence in support of liquefaction:—

		s.	d.	lbs. dung.	t.	cwt.	st.	lb.
No. 1.	Water drill, 1½ cwt. Lawes superphosp.	11	3	13	18	2	4	0
	Dry drill, do. do.	11	3	13	8	10	5	10
No. 2.	Water drill, do. do.	11	3	13	19	2	6	12
	Dry drill, do. do.	11	3	13	13	15	0	0
No. 3.	Water drill, do. do.	15	0	13	19	2	6	12
	Dry drill, do. do.	15	0	13	12	15	5	10
No. 4.	Water drill, do. do.	11	3	13	27	5	5	10
	Dry drill, do. do.	11	3	13	16	10	0	0
No. 5.	Water drill, do. do.	11	3	10	30	0	0	0
	Dry drill, do. do.	11	3	10	20	13	4	8

To this we may briefly add another experiment, by the late Mr. Pusey:—

Water drill, 6 cwt. superphosphate	13½ tons
Dust drill, ditto ditto	6½

Mr. Pusey then adds, "I cannot account for this enormous difference; I never saw so great a difference before: and after some years' experience of the two drills, I have determined to abandon the use of the dust drill, and to use the water drill only." Mr. Pusey then goes on to say: "There is, firstly, the advantage that you can drill in dry weather at once; secondly, that the manure is better diffused in the soil, for each plant to feed upon; thirdly, that you save the expense of the ashes required by the dry drill; fourthly and lastly, that much less labour of horses and men is required with the water drill."

From these and other practical results, we feel justified in calling attention to so important a branch of our progressive agriculture, feeling a conviction that the use of liquefied manures will become more general as they become better known.

If *liquid* manure from the farmyard or tank is selected for application with the crop, more than ordinary care must be had to its dilution with water before use, or serious consequences may follow, especially if the liquid manure be applied in a too highly concentrated form. There is an interesting paper on this head by Dr. Sprengel in the Royal Agricultural Society's first Journal, which may be consulted to advantage. Sprengel says "that diluted liquid manure contains nearly four times as much ammonia as urine left to putrefy in its natural state."

CAUTION TO FARMERS.—CATTLE POISONED BY SPURIOUS RAPE CAKE.—At the recent County Court at Grantham, Mr. S. Faulkner, of Waleot, sued Mr. Richard Branston, of Spittlegate, for £50. Faulkner bought what was represented as rape-cake (two tons), and gave it to his cattle, on the recommendation of Branston, who sells it for that purpose. He gave a quantity, averaging 2½ lbs. each, to ten beasts, three of which were taken seriously bad, and died within twelve hours. Four of the others were very bad, but recovered, although they had not yet got their flesh. He claimed £14 each for the three beasts, and £5 each for the others but reduced his claim to 50/., to bring it within the jurisdiction of the court. The contents of the stomach of one of the beasts were sent to Mr. Herpath, the eminent chemist, of Bristol. He found black mustard-seed in the stomach, and in the cake, and stated that black mustard-seed is poisonous to cattle. For the defence, witnesses were called to prove that other cattle had eaten the cake without injury; but Mr. Grammit, of Elsthorpe Lodge, proved that he, knowing of the above case, and being a friend of Branston's, gave some of the cake to his beasts cautiously, and in rather smaller quantities, and lost three of them. Verdict for the plaintiff for £42, the value of the three beasts that died.

## DISEASE IN SWEDEN TURNIPS.

SIR,—I fear there is much truth contained in Mr. Pinder's letters in last Thursday's *Guardian*—that there has been a great and serious loss from decay among the roots of Swedish turnips this season (which is undeniable), and that the too free use of guano, or other strong ammoniacal manurial agent, in their production has something to do with it. I have held this opinion for the last two or three years—even to the length that turnip seed, generally speaking, has likewise become deteriorated from being raised from over-stimulated guano-manured bulbs. Every turnip seed grower knows how extensive has been the loss from the decay among the roots intended to be saved for the growing of seed the last two or three seasons; and where there has been such extensive loss, I think it not unreasonable to suppose that the quality of those bulbs that survived to mature their seed may have materially suffered, to the great detriment of it, and so failed to produce seed "good after its kind." To obviate this, I would recommend parties to endeavour to procure sound and healthy seed grown on well-drained strongish clay laud with farm-yard manure, from carefully selected and transplanted bulbs. Both in the animal and vegetable kingdoms we universally find the seed or produce weakened and injured (and even destroyed) by an unnatural forcing of their functions.

I think from the time Liebig first made known the valuable properties of guano, there has been too great an inclination to rely upon it in the growing of roots—more especially Swede turnips—the last few years. As the experiment quoted by your correspondent shows, superphosphate of lime is superior for this purpose, or, at all events, it may be said to be equal to guano in producing weight per acre. (Superphosphate I consider ought only to be employed as a supplementary aid to farm-yard manure, if this latter is to be had—say 4 cwt. of superphosphate of lime to a half dressing of dung). A great many experiments have been tried, both in England and Scotland, and have clearly proved that turnips grown by the aid of dissolved bones are more healthy and robust in constitution, as well as superior in feeding qualities, to those grown with guano.

A most successful grower of turnips—a friend of mine, a large Yorkshire farmer, who generally has from 100 to 150 acres annually—tells me that he never yet has had any serious loss among them; he has been in the habit for many years of using superphosphate of lime and bones to a very large extent, and he is obliged occasionally to use them alone, instead of as an auxiliary to his farm-yard manure, as he prefers and usually practises, finding a better proportionate return from so doing. Here I may be allowed to say—beware of the numerous adulterated samples of superphosphate there are now in the market. Never was the warning of "Caveat emptor!" more needed than at the present time. Let farmers buy with caution, and not without having an intelligible analysis showing what they are getting for their money, otherwise they may easily lose both their money and crop.

My Yorkshire friend (who is very particular about his turnip seed—generally growing his own, but occasionally procuring a change of seed from the north of Scotland, grown on strong clay or "kerse" land), in addition to purchased superphosphate, uses a quantity of home-prepared bones with charred clay, ashes, and other vegetable matter. A heap of the latter is formed, and half-inch bones well saturated with water or liquid

manure placed in the centre of it, well covered up, and left for a few weeks, when the bones are found perfectly dissolved, or rather digested, being reduced to a sort of pulpy powder (easy for assimilation by the organs of the turnip plant); the whole mass is then well mixed together, with the occasional addition of a small quantity of common salt, and drilled in with the seed, or rather under it. This system combined with deep culture (the first ploughing of his fallows being as deep as possible), has always given him good healthy Swedes of an extraordinary weight per acre.

I am not writing against the utility of guano, inasmuch as I consider it a most valuable fertilizer in certain cases and conditions; but, as Ovid says, *Nil enim prodest, quod ledere non possit idem*—there is nothing advantageous which may not be converted to injurious purposes—and I think guano has been in many cases injuriously applied to the turnip crop, by over-stimulating and forcing the growth of certainly large crops, but I fear quantity at the expense of quality, so that should any external influence, atmospheric or otherwise, act upon the crop so as to produce a diseased condition, decomposition of vegetable fibre ensues, and rapid decay takes place, there being no stamina left to fall back upon. Now, although we are unfortunately much in the dark respecting the cause and cure of such disease, it is plain to me there is a remedy to be found somewhere, and that, if we fail in discovering it, it is owing to our being ignorant of the laws regulating the healthy growth of the plant, and of the injurious influences that interfere with the natural and regular operation of these laws, forming that beautiful adjustment of our system, and conducting to the well-doing of every individual that is found in the entire vegetable and animal kingdoms of the world. One thing appears plain, that in the growth of turnips we do not require ammonia so much as we want the inorganic constituents—phosphates (phosphorus) and sulphur—so essential to its perfect development. Now, Peruvian guano contains about 20 per cent. of phosphates, and 16 of ammonia; fresh ground bones contain 60 per cent. of phosphates (sheep bones 70 per cent., horse bones 67, ox bones 58, calf and pig bones 51 per cent.), and about 6 per cent. of ammonia. On the other hand, allow me to observe ammonia is a most essential ingredient in a manure required for plants of the natural order of graminæ, such as wheat, barley, oats, and the pasture grasses, but even here it requires using with care, and it is found guano applied in combination with common salt, or the nitrate of soda, acts more beneficially than when used by itself.

The action of ammonia upon vegetation appears very peculiar, and is, I think, but little understood at the present time. It may, perhaps, be interesting to some of your readers to remark that a valuable paper was a short time ago communicated to the Royal Society by Mons. Ville, of Paris, called "Researches on Vegetation." The author gives a long account of the influence of ammonia on vegetation, which causes the latter to become remarkably active. Besides this effect, Mons. Ville says there are others which are more variable, which depend upon particular conditions, but equally worthy of consideration—that we can, in fact, by means of ammonia not only stimulate vegetation, but, further, we can modify its course, delay the action of certain functions, or enlarge the development of certain organs. The author further remarks that, if its use be ill-directed, it may cause accidents. Those which have occurred

in the course of his experiments appear to him to throw unexpected light on the mechanism of the nutrition of plants—that they have, at least, taught him at the expense of what care ammonia may become an important auxiliary of vegetation, adding that there are periods to be selected for the employment of ammonia during which it produces different effects—that, if we commence its use when several months intervene before the flowering season of plants, it produces no disturbance; they follow the ordinary course of their vegetation—if its use be commenced at the time of flowering, this function is stopped or delayed, the plant covers itself with leaves, and, if the flowering takes place, all the flowers are barren. However

interesting and remarkable the facts arrived at by such able researches may be, I feel I am, as the lawyers say, “travelling out of the record” in some degree, and that it is time to close these lengthened but hastily written “thoughts on turnips,” the growth of which, together with the perusal of this week’s *Guardian*, has served at all events to beguile a couple of hours’ “waiting for the train”—the up-mail at Derby Station this morning—by yours very truly,

C. NICHOLSON, Land Agent.

Nottingham, March 21st, 1857.

—Nottinghamshire Guardian.

## WHY LAMBS DIE WHEN FED UPON COW MILK.

I observed some time ago, in the *North British Agriculturist*, a letter from a correspondent making inquiries regarding the nutritive properties of ewe and cow milk, and the reason why so many lambs die when fed upon the latter. From the analysis of their constituents given in the “*Agriculturist*” of March 4th, it is evident that their feeding qualities very nearly approach each other, and plainly point out that the reasons why lambs do not thrive when fed upon cow milk, and so frequently die when the ewe’s milk has to be supplemented by it, must be sought for apart from any peculiarity in the qualities of the milk itself; and I consider that the remarks given along with the analysis fully embody these reasons, which I shall only attempt to give more at length, as the views there stated are (as far as they go) exactly those which I have adopted after giving the matter all the attention which I was capable of exercising, and for which my occupation as a shepherd has afforded abundant opportunities.

The lamb draws its nourishment from the dam in very small quantities at a time, and receives it at a temperature corresponding to the heat of its own body, and suitable for its tender stomach. Now, when ewes do not yield a sufficient quantity of milk for the support of their lambs, and cow milk has to be resorted to, the lambs are allowed to follow the ewes in the field, and except in cases where the ewe yields very little, they are fed only twice a-day, morning and evening, and at these times are filled as full as they can hold. The milk is given either warm from the cow, or heated upon the fire, and where there is a good number of lambs to feed, the milk is often almost cold before they are all served, while in no case can it be given to them in the exact temperature in which they draw it from their mothers. This has a most injurious effect upon them; as those who have fed lambs in the open air, and even in houses, will have observed that they never fail to tremble for a long time after receiving a full feed of milk. This I consider is occasioned by the withdrawal of so much of the vital heat from the body to the stomach, where it is required to raise the temperature of the large quantity of food which has been poured into it in a state not corresponding with its natural heat. It is easy to conceive the effect of this during cold weather, and especially during cold nights. A part die, and others become lame from swelled joints—a species of rheumatism occasioned by cold, and improper food; and it has often been remarked at the end of a cold lambing season, during which a large quantity of cow milk had been given, and no small labour spent in the giving of it, that it was “all lost.”

The large quantity of milk given to a lamb at one time is even more hurtful than the temperature that it is in. The

stomach sours owing to the quantity of whey upon it at once—the curd hardens, and after death lumps of it may be observed, apparently of different ages; the bowels get inflated with wind, and debility and death ensues. Lambs that are fed entirely upon cow milk, when they get it regularly, and at short intervals, and have room for exercise, thrive much better than those who follow their dams, and are assisted in the manner described. During severe seasons, and when the weather is stormy, there is often a great number of lambs not following ewes, and which have to be fed in the house. These are made up of twins, where one has been taken from the ewe, who often at those times can barely maintain one—those whose mothers die, or have no milk for them. And it is too often the practice to put a number of these into a small confined place, where they have neither light nor exercise, and where the strong trample down the weak. Those who are thus treated die in great numbers, and what survive and are put to ewes when their own lambs die, seldom do much good, at least if they have been kept long in confinement. But the case is very different where lambs are allowed to run about and get milk warm from the cow, and at regular times: then they thrive well—thus clearly indicating that it is the mode of treatment, and not the milk, that causes the difference. It is a great improvement when they are fed from an artificial teat fastened upon the spout of a tea-pot, or other vessel suitable for the purpose, as they not only thrive better in the meantime, but take more readily with a ewe, and do better afterwards than they generally do when fed in the usual manner.

I have all along been taking it for granted that the cow milk with which lambs are fed is good; but this is often not the case, as its suitability for lambs depends not a little upon its age, the kind of food supplied to the cows, and other causes. What I mean by age is from the time of calving; for the newer the milk is, it is all the better for lambs. It is frequently given to them when it is too old in another sense; for it often happens that there is no milk to be had at the shepherd’s house, where the lambs requiring it are collected, and consequently it has to be carried from a distance, and in cases of necessity is sometimes given to them when it is more than twenty-four hours old; while, from being carried, and its qualities changed by the churning which it has undergone, it is otherwise far from being in a fit state for feeding a young and tender animal, and there is no doubt but that numbers of lambs die from this cause, although I consider it no argument against the wholesome nature of cow milk when given to them in a proper state and at proper times.

It is better policy to feed the ewe in place of the lamb. It

is like beginning at the foundation, or filling a fountain head. It is surprising how soon a few feeds of oatmeal porridge or gruel will bring a flow of milk upon a ewe when not entirely reduced in condition, and will enable her to keep her lamb alive without assistance; and whenever a ewe can do this, and the weather moderate, the lamb is better without any cow milk. It is a great improvement to put ewes having weakly lambs that require cow milk under cover during the night, as the lambs are often by this saved from perishing by the cold,

while the milk comes more quickly upon the ewes when they are sheltered from the weather.

Individual cases of lambs requiring to be fed with cow milk will occur in any season, and in any situation; but the demand for it would be greatly lessened, if not altogether superseded, were there a greater extent of cultivated land interspersed throughout the hilly districts.

JAMES COWAN.

Glasgow, March 20, 1857.

## FACTS CONCERNING THE WORKPEOPLE OF EUROPE.

For the adjustment of labour and capital each man has a different theory, according to his temperament. The political economist, who cares rather for law than humanity, proposes entire self-control, the annihilation of all natural instincts, and profound acquiescence in the present state of things, as the labourers' only means of salvation and advancement. The liberal politician trusts to an enlargement of the representative basis, and vote by ballot. The believer in the Divine institution of social *castes* would throw back the workman to the same dependent condition as that in which he lived in the old feudal times.

Whatever difference of opinion may exist in this respect, this we know of a surety—that if morals and christian truth be not at the basis of the social welfare of a nation, all economic expedients will prove to be ineffective.

And we are certain upon this other point: If the accumulation of capital, and consequently of power, has destroyed the spirit of fraternity and the spirit of slavery, the good with the ill that characterised the feudal times—if machinery has changed the character of human labour, and large associations have swamped individual efforts—if all these new phases are in positive existence, then the solution of our present difficulties must be made to agree with our present requirements; we must find a remedy for the existing evil that shall accord with the existing *régime*.

There is no reason why we should stick by the formulas of political economy if they are wrong. It may be difficult to return to better, but the difficulty of the task can never be a valid plea for not attempting it. It is the short-sighted who shirk a less difficulty to incur a greater. Everything which is in opposition to the nature of man, and to the law of God—everything which is contrary to moral order, is more contrary, more prejudicial to external order, than any reformation which should bring men back to the truth, even though it should be by means of a most violent tempest.

Anybody who has studied the social history of England in the sixteenth century must have seen a state of things in which the principles of political economy were consciously or unconsciously contradicted, where an attempt more or less successful was made to bring the production and distribution of wealth under the moral test of right or wrong, and where this law of supply and demand, which we are now taught to regard as immuta-

ble ordinances of Nature, were absorbed and superseded by a higher code.

Though we have reviewed most of the systems in which labour contracts are now made in Europe, and traversed back to those which did regulate our relations of capital and labour in England in times gone by, we have said enough to screen ourselves from the charge of desiring to revert to serfdom. It would be a folly to hold up the sixteenth as a model for the nineteenth century. The population has become too large, and employment too complicated and fluctuating, to admit of such control; while, in default of control, the reliance upon self-interest as the one motive principle is certain to ensue, and when it ensues is absolute in its operation. But, as even with us, these so-called ordinances of Nature in time of war and national danger consent to be suspended, and duty to his country become with every good citizen a higher motive of action than the advantage which he may gain in an enemy's market. So it is not uncheering to look back upon a time when the nation was in a normal condition of militancy against social injustice, when the government was enabled by happy circumstances to pursue into detail a single and serious aim at the wellbeing—wellbeing in its widest sense—of all members of the Commonwealth. There were difficulties and drawbacks at that time as well as this. Of liberty, in the modern sense of the word—of the supposed right of every man "to do what he will with his own," or with himself, there was no idea. To the question, if ever it was asked, "May I not do what I will with my own?" this was the brief answer, "No man may do what is wrong, either with what is his own or with what is another's." The Irishman's *laissez-faire* ideal seems now to be very popular, wherein "every man should do that which was right in the sight of his own eyes—and wrong, too, if he liked." Producers in those times, who were not permitted to drive down their workman's wages by competition, could not sell their goods as cheaply as they might have done, and the consumer paid for the law in an advance of price. Thus the poor were not degraded, and the rich paid a less sum in indirect taxation than they do now in direct taxation.

For our part we do not see much, save the name, in what is called the extension of the workman's liberty. To us it appears that the tendency of overstimulated industrial and commercial enterprise is to degrade and en-

slave the masses more than ever they were enslaved under the law of the guilds. It is true that England has gained the markets of the world; but how? Why, she has undersold all competitors, by loading her labourers with excessive burdens, and reducing their subsistence to the lowest standard of necessity. We abuse the tyranny of feudalism—we look with horror to the vassalage of the Russian serf; but no tyranny is more galling in its exactions than that which is hourly pressing men to pauperism and crime, or more chary of concessions and indulgencies than that of our great manufacturing cities. Why, our poorest population too have borne, like the French *tiers d'état* during the century that preceded the revolution of '89, the heaviest weight of taxation in proportion to their means.

Such a state of things as this calls loudly for remedy; it is discreditable to civilization, and is a practical disproof of our Christianity. The wide gaps that exist between the higher and lower classes; the want of proper sympathy between masters and servants, public charities; poor-laws; large families and sensuality—this is the concrete cause of all our social misery. The isolation cannot be bridged over by the condescending *patronage* of the rich, and whoever knows anything about "charities" abhors them as the source of greater miseries than they cure. They are wrong, because unjust and insufficient—because men who work ought not to need charity—because almsgiving to those who by nature and right ought to be independent of all but their own industry is in itself an engine of demoralization, and the confession of a social wrong. A low range of education is consequent upon a low rate of wages; and a low rate of wages springs from the non-recognition of the Divine truths, that labour has the right of its full reward, and that men have the right to labour. We require to inspire a spirit that shall completely destroy the tendency to regard present social conditions as unchangeable—a spirit that we must even go back to the better forms of feudalism to find, and which "absorbed in a higher code" those principles of political economy which were found not conducive to the interests of the working people. It is strange to see how oblivious we are to truths that appear to wound our self-interest. The history of France furnishes us with an illustration of this fact. The expenses of making and maintaining the king's highways were entirely thrown upon the peasantry. And this strange notion, that the cost of the roads was to be defrayed by the poorest persons, and by those who were the least likely to travel by them, though of recent date, took such root in the minds of those who were to profit by it, that they imagined that the thing could not be done differently.

There is one great fundamental truth that alone would, without difficulty, determine all the doubts and cases in social morality—one that would efficiently regulate all human society: I mean our Saviour's great rule—"Thou shalt love thy neighbour as thyself."

The observance of this rule is quite consistent with a continuance of the two classes, rich and poor—quite consistent with the gradations of rank. To obey another

man, to labour for him, to yield reverence to him or to his place, is not slavery; it is often the best kind of liberty—liberty from care. To yield reverence to another, to hold ourselves and our lives at his disposal, is not slavery; often it is the noblest state in which a man can live in this world. There is, indeed, a reverence which is servile—that is to say, irrational and selfish; but there is a rational, loving reverence, and a man is never so noble as when he is reverent in this kind. And where we see workmen animated by this spirit, we may always know that the master observes the great rule above cited.

We must not return to serfdom, but we must return to humanity. A state of poverty is not inconsistent with perfect contentment. But contentment in poverty very much depends upon the manner in which poverty is regarded by the rich, and the dignity that is attached to wealth. If it is scorned by the upper classes, if the poor are famished, if, above all, they are led to regard the means by which they obtain bread degrading, and so have no pleasure in work, they will be taught to look to wealth as the only means of pleasure. This is a terrible lesson, and one which religion does not teach.

The French Queen who, when told that the poor people must live, replied naively, "I do not see the necessity," did not apparently consider the Scripture rule—"The poor shall ye always have with you." This is a necessity. But the poor wretched is one thing, and the poor happy is another; the poor contented is one thing, and the poor disaffected is another; the poor a broad national rock foundation is one thing, and the poor a rotten pile-driven basis is another. And according as we masters read the scripture rule, so will be the condition of the poor; for God has purposely made a state of poverty consistent with a state of happiness. He has ordained a beneficent law, which equalizes to a degree beyond what most people imagine the happiness of the different classes of mankind. A man in the middle classes, surrounded by luxury, may, judging by his own feeling, consider poverty as the climax of human woe. But the ruder habitations, the coarser fare, the bodily toil of the poor, are not ungrateful to them; and it is only when they drop below their average condition that their sufferings commence. They may, like richer men, be troubled by the cravings of discontent; but their senses are not afflicted by circumstances which custom has rendered natural to them. The effect of custom is well illustrated by the sensations experienced by Captain Ross and his crew when taken on board the *Isabella*, after their Polar wanderings. Accustomed to lie on the frozen rock, the accommodations of a whaler were too luxurious for them, and Captain Ross was obliged to exchange his hammock for a chair.

When, however, the workmen are condemned to suffer from those intense forms of distress and wretchedness which are unfortunately too well known to them in our cities and rural districts, they lose their pleasure in work, and with it the spirit of contentment; and another spirit subversive of all good relations and feeling, subversive of the very instincts of nature, steps in, and agitates the breast with thoughts and purposes antago-

nistic to the weal of the "good estate." Richelieu boldly maintained, by his policy, the idea that the peasantry would not work without the constant stimulus of necessity—an idea which was profitably handled by the aristocracy and middle classes of France for a time. It led to their shifting almost the entire burden of taxation, and the burden of military service, on the peasantry. So great an injustice could not be endured without building up a massive barrier of hate and suspicion between the lower and higher classes. The upper classes thought the peasantry contented because they were comparatively merry. But they were merry only while their calamities seemed inevitable; when they saw a way of escape, they burst through it with relentless fury. M. de Tocqueville says with great truth, upon this subject—"It is always with great difficulty that men belonging to the upper classes succeed in discerning with precision what is passing in the mind of the common people, and especially of the peasantry. The education and the manner of life of the peasantry give them certain views of their own, which remain shut to all other classes; but when the poor and the rich have scarcely any common inter-

ests, common grievances, or common business, the darkness which conceals the mind of the one from the mind of the other becomes impenetrable, and the two classes might live for ever, side by side, without the slightest interpenetration. It is curious to observe in what strange security all those who inhabited the upper or middle story of the social edifice were living, at the very time when the Revolution was beginning, and to mark how ingeniously they discoursed on the virtues of the common people, on their gentleness, on their attachment to themselves, on their innocent diversions; the absurd and terrible contrast of '93 being already beneath their feet."

All history is given to warn and counsel. From the annals of the past we gather weapons and armour for the present. Let us be warned. For the sakes of those lower in the social grade than ourselves, let us be warned; for our own sakes, let us be warned; and girding ourselves as champions against those social wrongs that are at enmity with our domestic peace and national prosperity, let us march forward, with the grand assurance that God will defend the right.

F. R. S.

#### PROFESSOR WAY'S LECTURE ON GUANO.

On the first Wednesday evening in March the first of the series of Lectures for this season was given by Professor Way, at the House of the Royal Agricultural Society, in Hanover Square. Such an opening could not, unfortunately, have been made under more inauspicious circumstances. The whole country was just in the height of a general election. Landlords especially, and tenants in some degree at least, partook of the excitement; and the worthy Professor and his lecture were, no doubt, altogether forgotten by many a man who at any other time would have taken care to make a note of the occasion. The night, too, was stormy and wet, and "the first Wednesday" of the month happened inconveniently for other Societies, which found their first Monday and Tuesday a week further on. The attendance, consequently, was but small; being remarkable for the absence of many Members of Council who could attend the meeting in the morning, but who did not countenance the Lecture of the same evening.

Merely numbers, however, would be about the worst test of a metropolitan meeting of agriculturists. A large or small company, indeed, could have but little effect upon such a man as Professor Way and his course of proceeding. With his material already prepared he might go through his discourse almost as advantageously to "dearly beloved Roger" and the corps of reporters, as even with the sympathy and attention of a crowded audience. It is but fair to say that he performed his duty on as honestly for the benefit of the fourteen or fifteen members present, as if they had come in scores or hundreds. And all this was, remember, for their particular benefit only. The reporters, again, were not admitted, and unless these

fourteen or fifteen enlightened gentlemen tell the story vivâ voce each in his own district, nobody will know what Professor Way thinks of the guano difficulty, or how he would help us out of it.

The lecture, we repeat, was a most useful, and we may add a most encouraging one. It struck in every way against the present monopoly. It leads us to believe and hope that, in the Professor's own words, "we may be in perfect ignorance of large deposits of guano." It teaches us to look to many other, which if not quite rainless regions, might still furnish us with manure "highly valuable for agricultural purposes." It shows us, on the other hand, that, although only so far found in small quantities, there is guano yet better than the Peruvian. Mr. Way supported and illustrated his position with a number of maps of the districts he referred to, as well as by occasional quotation from the many dispatches received on the subject through the Foreign Office. The information so derived, is not, as might be supposed, of a very definite or reliable character. The chief conclusion, indeed, to be drawn from this official correspondence is, that a more diligent investigation should be entered upon by gentlemen better qualified to undertake the duty. Such a search, moreover, says Mr. Way, should not be confined, or merely directed to guano, but might be extended inland for nitrate of soda and nitrate of potash. These communications are so far useful that they may point the way to other possessions, if but properly pursued; while that information they do contain could hardly be made too public. Mr. Fisher Hobbs, at the meeting on Wednesday, suggested that they should be at once published in the Agricultural Journals, instead of being locked up for months in the Society's office,



unhonoured and unknown. So far we only hear that they are "important."

Then, again, though scarcely yet at liberty it would seem to give a full analysis, Professor Way assures us the Kooria Moorla deposits are "very valuable;" while he calls our attention to a kind of petrified guano as something more than a mere curiosity. It contains, in fact, in this state, many valuable properties, not hitherto always appreciated. "That stuff of any use?" asked a merchantman to whom it was shown; "why I have thrown ten thousand tons of it into the sea!"—when he was digging for the softer, or guano proper, beneath it. There is something, surely, of a lesson in this anecdote. With all this to encourage us, and to warrant the pursuit of our inquiries, the Professor dwelt on the increased competition likely to be for what guano there was now in the market, pointing particularly to America as an eager customer.

The discussion which followed, thanks chiefly to Mr. Hudson of Castleacre, was equally interesting. He entered at once on a very vexed question. From Mr. Hudson's own experience farmyard manure, exposed for two or three months on the land, is better for wheat than that of the same quality at once ploughed in. The reason of this is still something of a mystery. At a recent discussion of the Farmers' Club there was quite as much urged against as in favour of the "bleaching" process. Mr. Hudson proceeded from this to two or three questions as to the production of nitrate of soda, stating that if he could obtain it at a third cheaper rate he should use three times as much as he now did. Mr. Fisher Hobbs dwelt on the value of fish as a substitute for guano; and embodied in his remarks, as we have already stated, the desirability of the information possessed by the Society being at once disseminated.

We do not know whether we are liable to any special

indictment for saying what we have. We, however, trust not. There were two or three important facts in Professor Way's lecture that struck us as being particularly cheering, and as such we have ventured to whisper them to our readers. The lecture, we repeat, is another blow against the guano monopoly. The Farmers' Club, as a body of practical men, advises our resisting this by making the most of what we produce. The Royal Agricultural Society, with more sources of information, goes far to assure us "there is as good fish in the sea as ever came out of it;" and that some of these good fish may be landed even elsewhere than in Peru. Remember the captain throwing his thousands of tons away. Ponder over what else, the Professor tells us, we may discover in our researches; and we need not quite despair of getting something more than the Messrs. Gibbs' next consignment.

It is gratifying to see the Society thus usefully employed, and so keenly alive to the passing business of the day. The guano question was not the only one considered on this day. That of the murrain was again entertained, and a decisive and altogether energetic step determined on. Professor Simonds is at once to proceed to the Continent, accompanied by some other professor, who, in the quaint wording of the resolution, "will smooth the difficulties of the German language." There is no question but such a course should have been the first duty of the Government. In default, we can honestly congratulate the Royal Agricultural Society of England on coming so readily to the rescue. The Highland and Irish Societies share in the credit of this resolve, which it is right to say emanated in the first instance with our friends in Ireland. On the first Wednesday in May we hope Mr. Simonds may be able to give us the results of this investigation.

## THE APPREHENDED MURRAIN.

(From the Supplement to the *London Gazette* of Friday, April 3—Saturday, April 4.)

At the Court at Buckingham Palace, the 2nd day of April, 1857. Present, the Queen's Most Excellent Majesty in Council.

Whereas it has been represented to Her Majesty that certain contagious or infectious disorders are now prevalent among cattle in certain countries or places bordering upon the Baltic Sea, and that there is danger of the said disorders being introduced into this country by means of cattle, and horns, hoofs, and raw or wet hides, or skins of cattle, from such countries or places; now, therefore, Her Majesty, by and with the advice of her Privy Council, doth order, and it is hereby ordered, that from and after the date hereof no cattle and no horns, hoofs, or raw or wet hides, or skins of cattle, shall be imported or introduced into the United Kingdom which shall come from or shall have been at any place within those territories of the Emperor of Russia, or of the King of Prussia, or of the Grand

Duke of Mecklenburg-Schwerin, which respectively are in or border upon the Gulf of Finland, or any other part of the Baltic Sea between the Gulf of Finland and the territories of the Free City of Lübeck, or which shall come from or shall have been at any place within the territories of the Free City of Lübeck; and also that, from and after the date hereof, no cattle and no horns, hoofs, or raw or wet hides or skins of cattle, shall be imported or introduced into the United Kingdom which shall be, or shall have been, on board any vessels at the same time with any cattle or horns, hoofs, or raw or wet hides or skins of cattle, which shall have come from or shall have been at any such place as aforesaid.

And Her Majesty, by and with the advice of her Privy Council, doth hereby further order, that all cattle, and all horns, hoofs, and raw or wet hides, or skins of cattle, the importation or introduction whereof is so hereby prohibited as aforesaid, and also all hay, straw, fodder, litter, or manure, being or having been in or on board any vessels at the same time with any such cattle, or horns, hoofs, or raw or wet hides or skins of

cattle as aforesaid, shall, upon their arrival in this country, be destroyed, or otherwise disposed of, as the Commissioners of Her Majesty's Customs may direct.

And the Right Hon. the Lords Commissioners of Her Majesty's Treasury are to give the necessary directions herein accordingly.

C. C. GREVILLE.

The following well-digested article on the subject is from the *Times*, April 6:—

Precautions have at length been taken against the introduction into England of the infectious disease which is destroying the cattle of the Baltic countries. An Order in Council was published on Saturday, prohibiting the importation of cattle, or of horns, hoofs, hides, or skins, from those territories of Russia, Prussia, or Mecklenburg-Schwerin which lie on the Gulf of Finland, or between the Gulf and the city of Lübeck. It cannot be said that this prohibition is too stringent, or comes too early. Certainly an order which limits the supply of human food is a strong measure, but the case admitted neither of compromise nor delay. It was necessary to exclude rigidly and at once anything which could bring on the country so terrible a calamity as a mortality among the animals used for food. The disease which has necessitated these precautions has ravaged Silesia, Mecklenburg, and a part of Helstein for two or three years, and has latterly assumed a type so deadly as to rouse the apprehension of the principal Governments of the continent. The Governments of France, Prussia, and some of the smaller German States have already made regulations for the exclusion of the tainted cattle, or any part of their carcasses. Our insular position gives us greater chance of immunity, but does not free us from the necessity of taking some precautions.

The exclusion of cattle coming from Baltic ports will, no doubt, tend to raise in some degree the price of meat, but this evil is not for a moment to be balanced against the deliverance from the scourge of murrain within these islands. The importations from abroad, though they seem large in returns, form but a very small part of the supply necessary for the population. England and Ireland are pre-eminently grazing countries; the meat they produce is far superior to that of the Continent, and the quantity beyond all comparison greater than anything that the German ports can furnish. In fact this country is, after all, mainly supplied by the produce of its own territory. It is, therefore, sound

economy to take any steps which may tend to preserve our herds and flocks untainted. Temporary dearthness of meat, or leather, or of tallow, is but a small evil compared with the introduction of a malady which may sweep off thousands of our cattle, from Hampshire to the Highlands, and perhaps, after ravaging the country for years together, and by permanently deterioration the various breeds. In our damp climate, where a large supply of animal food is necessary for keeping up health and strength, the consequences of such a calamity as a general destruction of animals can hardly be contemplated without the deepest apprehension. No such event has happened in our own day, or even in the present age, but in former times such disasters were far from uncommon; and in the last century Europe was more than once swept by murrains which destroyed the animal food of entire nations. We think, therefore, that the Government has only done its duty in prohibiting all importations from the infected districts.

But there is probably more to be done than merely to search Baltic traders for cattle or hides. This disease, no doubt, has its causes and its cure, like those of human kind. The words "infectious" and "contagious" are very loosely used. It is probable that this malady is propagated chiefly where the state of the animals is generally unhealthy, or where, through want of proper care, or through insufficient food or shelter, their physical condition is weak. We may further assume that a disease of this sort is epidemic, and likely to break out in more than one place, without any intercommunication. Both these considerations point to the necessity of increased care in the treatment of cattle at home. It is not impossible that the disease arises from natural causes, and cannot be averted solely by quarantine regulations. No doubt, infection from abroad would cause it to assume a still more deadly form, but yet the seed may be already sown among us, and favourable circumstances may cause it to take dimensions of a great national calamity. Our agriculturists and breeders should therefore take their precautions in time. While Government is watching the outports, they should do all that science can suggest to stop the progress of the disease, or remove the causes which may lead to its appearance. If the crowding of cattle-sheds, and the want of ventilation and cleanliness have a tendency to encourage the epidemic, as certainly seems likely enough, no time should be lost in remedying defects which may be productive of such incalculable evil.

## REVIEWS.

### THE CATTLE PLAGUE AND DISEASED MEAT, IN THEIR RELATIONS WITH THE PUBLIC HEALTH AND THE INTERESTS OF AGRICULTURE.

BY MR. GAMGEE.

The rumour of the murrain, beyond the discussion it has given rise to in the House of Commons, at the Royal Agricultural Society, the Farmers' Club, and elsewhere, has also led to the publication of a pamphlet which must command attention, and which should not be without effect. It is called "The Cattle Plague and Diseased Meat, in their Relations with the Public Health and the Interests of Agriculture," addressed to Sir George Grey, and written by Mr. Sampson Gamgee, a gentleman of the medical

profession, who appears to have had very great and varied experience both in his own and the veterinary art. However correct the conclusions he may have arrived at, there can be no question but that he has taken up this subject with immense zeal and industry. We know nothing more of Mr. Gamgee than we gather from the work he has sent us; but we are inclined from this very much to respect his opinions, and at least to appreciate the motives which have led to their publication.

We shall let our readers in some degree judge for themselves, at the same time that we strongly recommend them to procure the work from which we quote. In the first place, as to the evil existing amongst us:—

"It is a publicly notorious fact, repeatedly verified by my

brother, that diseased beasts, in very considerable numbers, are sold in the New Cattle Market at Islington, which I inspected on Monday morning the 16th inst. The live beasts were generally extremely well-conditioned and thoroughly sound; but standing amongst them were three diseased beasts. One of these was emaciated and hide-bound, with abscesses in various parts of the body, particularly over the region of the head and neck. From the clinical observations I made on diseased cattle nine years ago, I believe this case was most probably one of pyæmia following typhoid fever. A second beast was in ill health, viz., thin and feverish, but I could not make a precise diagnosis. The third diseased beast was a fat one; it was lying down, meandering, looking round anxiously at its flanks; pulse, 110; respiration, 45; pleuro-pneumonia."

And again:—

"On Friday, the 20th inst., I several times visited the Islington market, and found in it many diseased beasts. The most remarkable example was a row of twenty-one very small and very old and emaciated cows; several of them bore unmistakable signs of old disease; one of them was moribund; it was standing in the throng, leaning almost its whole weight on the beast near it, striking out its head, panting for breath at the rate of forty times, or more, emitting large volumes of hot vapour from its lungs; its eyes were fixed and staring in the lean and deepened sockets; in the arteries of the extremities the pulse had ceased to beat; and out of two large ulcers the hinder extremities of the hip-bones protruded through the skin, which seemed artificially stretched over and bound down to a lifeless skeleton. From numerous inquiries in the market, I learned that such a state of things is by no means uncommon. In reply to my enquiries, an official in the administrative department made the following statement:—"It is notorious about diseased beasts in the market: never a market without them; often beasts are disgraceful to look at,—certainly unfit for human food: could not say why the inspector did not seize them."

Mr. Gamgee's researches and knowledge led him not only to detect many diseased animals, but yet more diseased in fact. Still confining him to our great Metropolitan Market, he says:

"So far as I have been able to ascertain, the slaughter-houses in the new cattle market are exempt from inspection: the clerk of the market so informed me, and he added that he regarded those establishments as private, inasmuch as though the buildings formed part of the public market, they were let to private individuals. If such be the fact, and I believe it practically is so, a premium is offered to sending diseased beasts to the cattle market; for the inspection of live stock being lax, and the slaughter-house exempt from supervision, the greatest facility is offered for disposing of diseased beasts and preparing their carcasses for the butcher, with all those arts of trimming, dressing, and polishing, which are well known to veil appearances of disease, so as to beguile the inexperienced, to facilitate a commercial fraud, and introduce the seeds of disease, and not unfrequently actual poison, into the unhappy individuals who unconsciously partake of the meat for the sustenance of their lives."

Mr. Gamgee appears to be a bold as well as an energetic man. He not merely denounces the inefficient inspection of our markets and slaughter-houses, but he further traces the abuse to the insufficient state of knowledge on cattle diseases, due, as he declares, in a great measure, to the non-observance of the very wise regulations framed by the founders of the Royal Veterinary College. After, moreover, carefully inspecting in person the great veterinary schools of other countries, he comes to the conclusion, and is prepared to prove, "that whereas England's wealth in animals by very far exceeds that of any other nation, it is very far inferior to all the countries of continental Europe, in knowledge of the diseases of animals, and in means for instruction in that all-important branch of science."

We must by no means be understood as endorsing all Mr. Gamgee's statements and opinions. In this very matter of our veterinary standing we do not go with him. No art has advanced so certainly amongst us of late years as that of veterinary science; while we could point to members of the College who would cope with their brethren from any country. Still nearly every thing Mr. Gamgee advances is suggestive, and it is a grave question whether we make all the use we might of the ability we have amongst us. We advise the members of the Veterinary College, too, not to overlook this pamphlet.

Our extracts have already run to some length, and we must stay our hand at least for the present, with one appropriate to the threatened visitation:—

"A regulation has provided for the sanitary inspection of foreign cattle on landing on our shores, but it is possible beasts and persons may, for the time, be in apparently perfect health, and yet be the bearers of the seeds of contagion. It is established, that the contagious typhus has an incubative stage of several days' duration. Under such circumstances it would appear as if perfect impunity could only be purchased by absolute prohibition of cattle imports, a measure which, however laudable in its aim, would be productive of serious consequences, by necessitating a very considerable rise in the price of animal food. Cheapness of food is manifestly a desideratum of great importance, and no effort should be spared to secure it, consistently with safety to one of the greatest sources of national wealth—the live stock of the agricultural community. I would recommend that no ship should be allowed to land cattle on our shores without producing a clean bill of health, in form of a certificate from the British consul at the port of export, that no epidemic or contagious disease prevailed among the cattle of that neighbourhood. As the Spanish cattle are very good, and there is every reason to believe that the supply could meet a much greater demand, sanitary regulations might render advisable, and economical reasons not oppose, the propriety of prohibiting for a time the importation from Holland and Northern Germany; for certain it is, that thence did the contagious typhus pass over to England in the last century, and that the greatest fears are now to be dreaded from that quarter. The value of these suggestions must depend upon accurate knowledge of the state of the disease all over the continent; which information once acquired, it would be very easy to keep up to the level of the day."

A Minister can scarcely be expected to con over the ineubrations of every pamphleteer who chooses to address him. It would be a hard place if he did. We do trust, though, that Sir George Grey may think and act a little on what Mr. Gamgee has to say.

#### A COLLECTION OF THE CUSTOMS' TARIFFS OF ALL NATIONS.

BY C. N. NEWDEGATE, M.P.

John Murray, Albemarle Street.

A few weeks since we had the pleasure of referring to a gentleman to whom an honourable compliment had been paid by his tenantry, on account of his uniform consistency as a member of the Legislature in support of the agricultural interests, and his liberal conduct and sterling integrity in his private capacity as a landlord and country gentleman. It is an equally pleasing duty to associate his name with one of the most useful commercial works that has been published of late years. We allude to the Book of Tariffs,\* compiled by Mr. C. N. Newdegate, the Member for North Warwick-

shire ; a work which, independent of its great practical utility in a commercial point of view, possesses a more general public interest, as exhibiting the various phases under which commercial intercourse is entertained by the different nations of the world.

The principles of commerce have, of late years, become the subject of universal attention and discussion in all countries, in consequence of the changes that have taken place in the fiscal regulations of the United Kingdom. Whatever differences of opinion may exist amongst the various classes of society, both here and abroad, on that subject, it is of manifest importance that in the community of nations by which the present age is characterized, the most perfect understanding should exist, and the utmost publicity be given, respecting the terms on which each nation thinks proper to conduct its own commercial intercourse with others. Without a knowledge of these, no merchant is safe in proposing to trade with a foreign people ; and such has hitherto been the confusion and intricacy of the fiscal regulations and scales of duties adopted and promulgated by most other nations, and so difficult were they to be ascertained, that it required no small amount of study and tact to render oneself acquainted with them, so as to steer clear of losses and prohibitions, not to say fines and confiscations, from committing breaches of, or infringements upon, custom-house regulations.

It is therefore of no small importance to a merchant to be assured that the information he has hitherto so anxiously wished, but found so difficult to obtain, is to be procured at a comparatively trifling cost ; and that from one volume he may now ascertain the precise terms on which he can conduct his commerce with safety, and dispose of his merchandise in any part of the globe, without danger of loss, so far as fiscal arrangements are concerned. Nor is this Book of Tariffs of less value to the political economist and the member of the Legislature, both of whom must have often felt greatly at a loss, when treating upon commercial affairs, for want of that specific knowledge which Mr. Newdegate's work imparts.

This elaborate compilation does the author the more credit that it has been accomplished without the aid—might we not say, in face of the negative opposition?—of his own Government. The idea, it appears, is no new or undigested one with him. So long ago as 1847, Mr. Newdegate moved in the House of Commons for returns bearing upon the subject ; and not being able to obtain the information he wanted, owing to the indifference and indolence of those whose duty it was to grant it, he began to collect the materials himself ; and as a preliminary (we presume), published in his letters on the balance of trade, the real value of the exports and imports of the United Kingdom. These letters, commenced in 1845, were now continued down to 1851, in the sessions of which year he made an attempt to induce the Government to furnish the House of Commons with a compendium of the tariffs of foreign nations, which they had ample means of procuring through the various British Consuls at the different

ports, &c. But “red tapism,” and a want of interest in the subject, prevented them from making the necessary inquiries ; and the little that was done was just sufficient to exhibit that ignorance of commercial affairs and of practical business for which, as a general rule, men high in office in this country are so notorious. Fortunately, in 1852, a book of Tariffs of all Nations, compiled by M. Otto Hubner, was published by order of the Prussian Government ; and Mr. Newdegate proposed to the respective Governments of Lords John Russell and Derby to have this work translated and published by the Board of Trade, but without success. Nothing therefore remained for him but to do it himself, and to make such alterations and additions to the original as the completion of his design required, bringing it down to the period (1855) at which the work went to press. Thus an important national work, which it was incumbent on the Government to undertake as soon as the necessity for it was made apparent, but which they had neither the tact nor the industry to accomplish, has been effected by the persevering efforts of one man, at a great expense of time, money, labour, and health. The work which is the result stands at once a monument of the indefatigable industry and the talent of the compiler, and a reproach to the Government who refused either to undertake it themselves, or furnish the materials to the man who supplied their deficiencies.

We have gone through the book, and in doing so have felt really astonished at the mass of information it contains, and at the determined perseverance the writer has evinced in the collection and arrangement of dry and multifarious details. We know something of the difficulty of collecting statistics of the same nature, on a small scale, and can fully appreciate the completeness displayed in the execution of Mr. Newdegate's work. With such aid as the work of M. Hubner afforded, and his own untiring industry, he has produced a volume which will prove of inestimable value, as a book of reference, to the merchant, the manufacturer, and the politician. Alterations will of course be required as the policy or the caprice of a government may suggest new tariff regulations ; but the work will still remain as the basis, if not the standard, of universal taxation on imports, until the example of the United Kingdom has met with a reciprocal feeling in other nations.

In glancing over the pages, we could not but notice how far both the commercial and agricultural nations with whom we have intercourse are from reciprocating the principle on which the commerce of the United Kingdom is conducted. France, by turns, prohibits the import or export of corn, according to the exigencies of the country ; or, in ordinary years, lays on a sliding scale of duty on foreign produce ; largely increased on cargoes imported in foreign bottoms. The duty on wool also ranges from 15 to 30 per cent. ad valorem ; whilst all manufactured goods pay heavy, and some of them prohibitory, duties upon importation. The same attempt at virtual exclusion of foreign manufactures prevails in all the continental States, except Sardinia, which has adopted the same commercial prin-

ciples as those of the United Kingdom. The United States of America have a tariff ranging from 15 to 100 per cent. ad valorem, which, at a moderate estimate, gives an average of 25 per cent. It is fortunate for our manufacturers that the abundance of fuel supplied by the coal mines enables them, by the use of machinery, to compete successfully with those of every foreign country, however low may be the rate of hand-labour in the latter. The struggle has been more severe with the agriculturists; but even here, such has been the energy and perseverance displayed in the improved cultivation of the soil, and in calling science to the aid of Nature, that the difficulties which at first appeared

insurmountable have given way, and increased production, encouraged by increased consumption, gives our farmers the advantage over those of every other country.

No one has viewed with more anxiety the changes that have taken place than Mr. Newdegate. No one has been more steadily and consistently the friend of the farmer, as a landlord, or more vigilant an advocate in his capacity as a member of the Legislature. In the work before us he has evinced an equal degree of zeal in promoting the safety and prosperity of commerce, by dispelling the ignorance and uncertainty under which it has hitherto been conducted with foreign nations.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held on Wednesday, the 25th of March. Present: The Rev. LEVESON VERNON HARCOURT, in the Chair; Mr. Beale Browne, Dr. Camps, Mr. Maddison, Mr. Scott, Professor Simonds, Mr. Vines, Professor Way, and Mr. Wrench.

Forty-three candidates were announced as standing for election at the next meeting.

**CATTLE MURRAIN.**—The Earl of Shelburne transmitted from the Foreign Office, by direction of the Earl of Clarendon, the following copy of an extract from the despatch, No. 44, of Lord Howard de Walden, her Majesty's Minister at Brussels:

"On the receipt of your Lordship's despatch, No. 33, of the 14th instant, respecting epidemic disease among horned cattle, I immediately made inquiries as to the existence in Belgium of the disease referred to. I am assured by one of the principal veterinary authorities in the country that at this moment the only complaint which is at all prevalent is an affection of the hoof, which is easily cured by cleanliness and the use of astringents; that the disease called *Peripneumonie*, which at times has caused such ravages among the cattle in Belgium, though occasionally appearing, has not at present anything of the character of an epidemic."

The Council having expressed their thanks for the favour of this communication, remarks were offered to the meeting on the following points, by the Chairman, Prof. Simonds, Prof. Way, Dr. Camps, Mr. Scott, and Mr. Vines:

1. On the importance of the information just received, that the Russian murrain had not passed over from Mecklenburg, whence comparatively few importations of cattle were made for this country, into Belgium, whence our largest supplies were derived.
2. On the fact that, while cows going off their milk were most liable to the attack of pleuro-pneumonia, disease in the London dairies is at the present time not only at its lowest amount, but its results less fatal than ordinary.
3. On the probability that there is no specific remedy for pleuro-pneumonia, and that but few cases occur in which it is profitable to attempt a cure of the malady.
4. On the peculiar condition of the lungs in the animals dying of pleuro-pneumonia, and the advantage of an

early application of the stethoscope for the purpose of ascertaining the first indications of disease.

5. On the probably sound (though less nutritious) condition of the flesh of animals slaughtered while suffering from pleuro-pneumonia, especially after its having been thoroughly cooked.
6. On the absence of any apprehension that the flesh of animals slaughtered while suffering from the Russian murrain *could* be brought into the markets, as rapid decomposition would ensue not only immediately after death, but in many cases even before death had taken place.
7. On the mischievous tendency of attempts made at the present moment to confound *typhoid* forms of disease generally amongst cattle in this country, with the *contagious typhus* now raging among the cattle of the north of Europe.

The Council were also favoured with a communication from Mr. Horsfall, referring to papers he had published in reference to the theory of pleuro-pneumonia and its cure.—Mr. Vines took that opportunity of presenting to the Society copies of his work on the most important Diseases of the Horse, and of his Veterinary and Physiological Essays; which were received with the thanks of the Council.

**POTATO DISEASE.**—Mr. Blanchard transmitted from Guernsey, as the result of his experiments, a statement that a stock of healthy Potatoes could be derived only from planting whole and perfectly sound tubers; while cuttings gave an inferior stock.—Prof. Way referred to some experiments he had made on sound and unsound Potatoes. He found that if fresh slices of Potatoes, in each of these conditions, were placed in separate portions (about a quarter of a pint) of new milk, and kept warm for three or four hours, the milk in which the sound slice had been put would remain perfectly fresh and sweet; while that in which the unsound slice had been put would have become curdled. In many cases it was difficult to detect by the eye a sound potato from an unsound one; whereas this test at once decided the inherent qualities of each. Malt, he remarked, had the same effect on milk; and he attributed the effect of diseased potato on that fluid to the same cause, namely, to the presence of a peculiar fermentative principle.—

The Chairman referred to the effect of diluted sulphuric acid in hardening the substance of the potato; and to the presence of a central cavity in diseased tubers so steeped, containing a liquor of most offensive character. Adjourned to April 1.

A MONTHLY COUNCIL was held on Wednesday, the 1st of April. The following members of Council and governors of the Society were present:—Mr. EVELYN DENISON, M.P., President, in the Chair; Earl Spencer, Lord Walsingham, Lord Feversham, Mr. Raymond Barker, Mr. Cavendish, Mr. Druce, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Hudson (of Castleacre), Mr. Kinder, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Allen Ransome, Mr. Shuttleworth, Professor Simonds, and Mr. Burch Western.

Algernon Perkins, Esq., of Harley-street, Cavendish-square and Hanworth Park, Middlesex, was elected a Governor of the Society.

The following new members were elected:—  
 Atkins, George Caleb, West Ho., Edgbaston, Birmingham  
 Arnold, Lewin, Tormarton, Chippenham, Wilts  
 Barratt, John R., Oakley House, Fallowfield, Manchester  
 Barrington, William, Thorney, Isle of Wight  
 Beale, W., Larking's Farm, Chiddingstone, Edenbridge, Kent  
 Box, John (civil engineer), Brussels, Belgium  
 Braach, J. G., Pelham Place, Brompton, Middlesex  
 Cabrera, Gen. Count Demorella, Wentworth, Virginia-Water  
 Child, William, Burnham Mauor, Andover, Hants  
 Clark, John, The Hague, Chesterfield, Derbyshire  
 Clarke, Henry James, Burley, Oakham, Rutlandshire  
 Cleasby, Thomas M., Wilton Grange, Redcar, Yorkshire  
 Fairbairn, George, Holmes-Chapel, Cheshire  
 Fawcett, Wm., jun., Burton-Salmon, Milford Junction, York  
 Findlay, John, Garnstone, Hereford  
 Forster, Edward, Salisbury Hall, Chingford, Essex  
 Fox, Alfred Lloyd, Falmouth, Cornwall  
 Glenton, Frederick, Bensham, Newcastle-on-Tyne  
 Gregory, John, Shavington Park, Market-Drayton  
 Harris, Wm., Wollaston, Wellingborough, Northamptonshire  
 Holbeach, Rev. Charles William, Farnborough, Oxfordshire  
 Jones, W. Cove, Stratford-on-Avon  
 Kelsey, E. E. Peach, The Close, Salisbury  
 Lowe, John, Wheelock Heath, Sandbach, Cheshire  
 Minton, Curteis, Smithfield, Stratford-on-Avon  
 Petty, W. Edwin, Southampton  
 Plowman, Joseph, Oxford  
 Rea, Thomas, Westonbury, Peterbridge, Herefordshire  
 Shittler, William Rowden, Bishopstone, Salisbury  
 Simpson, Samuel, North-Laith, Rufford, Notts  
 Sockett, Richard, Dagenham, Essex  
 Stanley, Henry, Upton, Shiffnal, Shropshire  
 Tanner, Henry, South Hill Farm, Southamilton, Devon  
 Terry, Rev. Stephen, Dunsmore, Basingstoke  
 Thomas, L. H., Caerfynnon, Harlech, South Wales  
 Thomas, George Treherne, Château-Hard, Thurgovie, Switz.  
 Thomason, William, Barnby Moor, East-Retford  
 Wheatley, John, Neswick, Driffeld, Yorkshire  
 Whithead, Charles, West-Farleigh, Maidstone, Kent  
 Turner, Philip Henry, Shawwick, Bath  
 Tanton, William, Redlyuch, Salisbury  
 Williams, Rev. Walter Jones, Brecon, South-Wales.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, presented to the Council the monthly report on the accounts; from which it appeared that the current cash-balance in the hands of the bankers on the previous day was 1,025*l.* Mr. Barker also presented reports from the House, General Salisbury, and Implement Committees, which were adopted. Mr. Brandreth Gibbs reported the completion of the Andover and Salisbury Railway.

MEMBERS OF COUNCIL.—In the unavoidable absence of Mr. Thompson (High Sheriff for the county of York), Mr. Milward moved, and Mr. Raymond Barker seconded, Mr. Thomson's nomination of Mr. Paget, M.P., of Ruddington Grange, near Nottingham, for the vacancy in the general list of Council occasioned by the transfer of Mr. Bramston, M.P., to the class of trustees. Mr. Paget was duly elected.

CATTLE MURRAIN.—The Earl of Clarendon favoured the Council with the following communications:—

“Foreign Office, February 28, 1857.

“Sir,—With reference to Mr. Hammond's letter of the 12th of June last, I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Council of the Royal Agricultural Society, the accompanying copy of a despatch from the British Vice Consul at Lubeck, stating that the murrain having again broken out at Mecklenburgh, the Lubeck authorities had prohibited the introduction of horned cattle from that state, unless provided with a certificate declaring them to be free from the disease. I am, Sir, your most obedient humble servant,  
 “SHELBUENE.

“James Hudson, Esq.”

“Lubeck, Feb. 20, 1857.

“Sir,—I have to report that in consequence of the murrain described in my despatch of May 30, 1856, having again broken out in Mecklenburgh, the Lubeck Government by a senatorial decree published this day have renewed the decree of May 14, 1856, prohibiting the entry of horned cattle into the Lubeck territory from the Duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz, unless they are certified by the competent authorities to be entirely free from the disease. I have, &c.,  
 (Signed) “J. A. BLACKWELL.

“Colonel Hodges.”

“Foreign Office, March 10, 1857.

Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Trustees of the Agricultural Society, a copy of a despatch from her Majesty's Minister at Berlin, relative to the disease in cattle. I am, Sir, your most obedient servant,  
 “SHELBUENE.

“J. Hudson, Esq., Agricultural Society.”

“Berlin, March 6, 1857.

“My Lord,—Having observed that mention has been made in the House of Commons of the rapid spreading of the cattle disease, I have the honour to report to your lordship that according to the latest accounts received here, it does not appear to have crossed the Russian frontier; but alarm has been caused by its ravages in the neighbourhood of Taurögen. Precautionary measures have been taken by the Prussian authorities to endeavour to arrest its advance into this kingdom. I have, &c.  
 (Signed) “BLOOMFIELD.

“The Earl of Clarendon.”

“Foreign Office, March 23, 1857.

“Sir,—I am directed by the Earl of Clarendon to transmit to you, for the information of the President and Trustees of

the Royal Agricultural Society, an extract of a despatch from her Majesty's Minister at Brussels, relative to epidemic diseases among horned cattle in Belgium. I am, Sir, your most obedient humble servant,

"SHELburnE.

"The Secretary of the Royal Agricultural Society."

"(Extract from Lord Howard de Walden's despatch, No. 44.)

"On receipt of your lordship's despatch, No. 33, of the 14th inst., respecting epidemic disease among horned cattle, I immediately made inquiries as to the existence in Belgium of the disease referred to. I am assured by one of the principal veterinary authorities in the country that at this moment the only complaint which is at all prevalent is an affection of the hoof, which is easily cured by cleanliness and the use of astringents; that the disease called Peripneumonie, which at times has caused such ravages amongst the cattle in Belgium, though occasionally appearing, has not at present anything of the character of an epidemic."

"Brussels, March 27, 1857.

"My Lord,—With reference to my despatch, No. 44, of the 20th inst., in which I transmitted to your lordship a copy of the *Année* of May 22, 1854, I have now the honour to add one of the first copies of a work which has just been printed under the authority of the Department of the Interior, which contains a full recapitulation of all the laws and regulations which bear upon the general veterinary service in regard to sanitary questions connected with the diseases of animals. In respect to the statement I made in my despatch, that no special disease, presenting anything of the character of an epidemic, is now prevalent in Belgium, I have since received full confirmation of the correctness of that information from the Department of the Interior. No law exists under which diseased cattle can be excluded at the frontier; a project of law with a view to such sanitary precaution was presented to the Chambers two years ago, but was rejected; and therefore the only resource lies in the activity of the Burgomasters in frontier localities by enforcing the general regulations in regard to animals while within the range of their jurisdiction. I am, &c. (Signed) HOWARD DE WALDEN & SEAFORD.

"Lord Clarendon."

"Foreign Office, March 28, 1857.

"Sir,—I am directed by the Earl of Clarendon to transmit herewith, for the information of the President and Trustees of the Royal Agricultural Society, a copy of a despatch from her Majesty's Minister at Berlin, reporting the appearance of the cattle disease in the Prussian dominions. I am to add that this information was communicated to the Board of Trade immediately upon its receipt. I am, Sir, your most obedient humble servant,

"E. HAMMOND.

"The Secretary to the Royal Agricultural Society."

"Berlin, March 23, 1857.

"My Lord,—I regret to have to inform your lordship that the cattle disease has appeared in the neighbourhood of Berlin. Every precaution was supposed to have been taken to prevent its arrival in the Prussian States, and measures have now been adopted to endeavour to arrest its progress. Having alluded to the subject this morning in the course of conversation with Baron Manteuffel, his Excellency read to me a communication which he had just received from Monsieur de Raumer, stating that the disease had been traced to some cattle lately arrived from Galicia, and that those which had not died had been killed by order of the magistrates, and that, further, all the cattle known to have been in contact with them had been destroyed. Baron Manteuffel appeared to be under considerable alarm that the

disease would reappear, notwithstanding these precautionary measures and the utmost vigilance of the authorities.

"I have, &c.,

"Earl of Clarendon, K.G." (Signed) "BLOOMFIELD.

"Foreign Office, March 30, 1857.

"Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President of the Royal Agricultural Society, the copy of a despatch from her Majesty's *Chargé d'Affaires* at Hamburg, forwarding a copy and translation of the decree issued by the Lübeck Government on May 14, 1856, relative to diseased cattle.

"I am, sir, your most obedient, humble servant,

"Jas. Hudson, Esq."

"E. HAMMOND.

[TRANSLATION.] No. 14.

"May 14, 1856.

"Notification relative to the pulmonary disease that has broken out among the horned cattle within the Grand Duchy of Mecklenburg-Schwerin, published on May 15, 1856.

"The Senate, being officially informed that several cases of pulmonary disease have occurred among the horned cattle within the Grand Duchy of Mecklenburg-Schwerin, think it proper to republish the regulations directed to be observed by the notification of the 7th of August, 1852, in order to prevent the spreading of this dangerous and contagious disease. 1. Every owner of cattle is required, in case any disease should break out among the same, to separate the diseased from the other cattle. The symptoms of the disease are a hoarse coughing, that increases particularly after the cattle have drunk or moved about; less inclination for food, indifference as to chewing the cud, dullness of the hair, and its rough appearance in particular places, and fever after these symptoms have continued for some time. 2. On the appearance of this disease, or even in cases when it is suspected to exist, the owners of cattle are required, under a penalty of a fine of 20 dollars (about £3 10s.), to give immediate notice to the chief of the police (or to the bailiff at Travemünde), who will take further steps. 3. The bringing in of cattle into the Lübeck territory from the Grand Duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz, shall only be permitted when the cattle are accompanied by satisfactory certificates of their being free from disease. 4. All veterinary surgeons are directed, in case this disease should break out within the Lübeck territory, to adopt the necessary sanitary precautions according to the instructions of the police. The directions of the veterinary surgeons are implicitly to be obeyed under penalty of heavy fines and imprisonment. 5. Finally, all police officers, bailiffs, and *gens d'armes* are hereby directed to give notice to the respective police-offices in case any horned cattle should be attacked with the pulmonary disease, or even in cases where it is suspected to exist. Given at Lübeck in the Assembly of the Senate, this 14th day of May, 1856.

"(Signed) C. TH. OVERBECK, Dr., Secretary."

"Hamburg, March 20, 1857.

"My Lord,—In compliance with the instructions contained in your lordship's despatch, Consular No. 7, of the 14th instant, I have the honour to transmit three copies of original, and translation of the decree of the Lübeck Government, dated the 14th of May, 1856, relative to diseased cattle.

I have, &c.,

"Earl of Clarendon."

"G. LLOYD HODGES.

"Foreign Office, April 1, 1857.

"Sir,—With reference to my letter of the 23rd ult., I

am directed by the Earl of Clarendon to transmit to you for the information of the Council of the Royal Agricultural Society, a copy of a further despatch from her Majesty's Minister at Brussels, containing particulars as to the disease amongst horned cattle. I am, sir, your most obedient humble servant,

"SHELBURNE.

"The Secretary to the Royal Agricultural Society."

"Foreign Office, April 1, 1857.

"Sir,—I am directed by the Earl of Clarendon to state to you, for the information of the President and Trustees of the Royal Agricultural Society, that her Majesty's Minister at Dresden reports, in a despatch received this day, that 'at this moment the only existing cattle disease in Saxony is of the horns; that of the lungs, called in French "Epizootie," does not now exist.' I am, sir, your most obedient, humble servant,

"J. Hudson, Esq."

"SHELBURNE.

"Foreign Office, March 30, 1857.

"Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Committee of the Royal Agricultural Society, copies of telegraphic despatches from her Majesty's Consuls at Danzig and Stettin, stating that the murrain does not exist amongst the cattle in the neighbourhood of those cities. I am, sir, your most obedient, humble servant,

"E. HAMMOND.

"Jas. Hudson, Esq."

"From Consul St. Plaw to the Earl of Clarendon, dated Danzig, March 29, 1857.

"No information to give as to cattle disease has at all appeared in this neighbourhood, it having been confined to East Prussia and Lithuania. The authorities here have in no case been called upon to give any directions or instructions."

"From Consul Blackwell to the Earl of Clarendon, dated Stettin, March 29, 1857.

"Murrain does not prevail here. Regulations against it rescinded. Full account of disease given in my despatch of May 30, 1856.

(Signed) "BLACKWELL."

"Foreign Office, March 30, 1857.

"Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Committee of the Royal Agricultural Society, copies of despatches from her Majesty's consuls at Warsaw and Königsberg, reporting on the cattle disease. I am, sir, your most obedient, humble servant,

"E. HAMMOND.

"Jas. Hudson, Esq."

"Warsaw, March 9, 1857.

"My Lord,—I have the honour to report to your lordship that the cattle disease, which has caused such ravages in the farms of the landholders in this kingdom, is still prevalent, though not, so far as I can understand, so much so as it was during the autumn. Within the last fortnight a gentleman of my acquaintance lost nearly every beast he possessed in the neighbourhood of Warsaw. The infection is so virulent that it is said a farm servant, who has been in attendance on sick cattle, may carry it in his clothes, and impregnate other beasts with the fatal distemper. The measures adopted to stop the spread of the disease are very summary, the most indiscriminate slaughter of the beasts affected being ordered and carried out. In Prussian Poland, where a more stringent execution of these measures has been enforced than has been the case in this country till a late date, it is said that the evil has been nearly, if not wholly overcome. I am not aware whether an

exportation of cattle takes place from Dantzic for the British ports. If there should be such a trade, it might be advisable to subject all beasts imported either from that town or Königsberg to a lengthened quarantine, as there seems to be no doubt that the disease occasionally breaks out in herds some time after they have been domiciled in their new quarters. The disease originally comes from the Steppes of the Ukraine, whence vast numbers of cattle are yearly driven westward. It would appear to commence with violent fever, which rapidly degenerates into acute dysentery, the animal dying in a few days after the first appearance of the disorder, of intestinal ulceration. I have &c.

(Signed) "W. W. MANSFIELD.

"The Earl of Clarendon."

"British Consulate, Königsberg, March 11, 1857.

"My Lord,—I have the honour to acknowledge the receipt of Lord Shelburne's despatch, No. 2, of 7th March, and to report that since 1854 rumours of a murrain or cattle-plague in Volhynia and Podolia were current, and that since that time the disease has been advancing in a northerly and westerly direction, and that most distressing accounts have been received of the ravages amongst the cattle, and of the disease spreading till close upon the Prussian frontiers. The Prussian Government during the years 1855 and 1856 took great precautions to prevent the disease from entering Prussia, by detaching parties of military at all the points of egress from Poland below Thorn. In the autumn of 1856 until now the disease has continued its march, and at last reached Kowno and Taurroggen. The Prussian Government has now enforced most stringent measures all along the borders; and no hides, calf-skins, wool, rags, or any article which is likely to have been in any way connected with cattle, and all Jews and other persons who are in any way suspected of having transactions with cattle or any of those articles, are permitted to cross the borders, and when any such attempt is made the articles are immediately burned. By these means the disease has up to the present time been kept out of Prussia, and the greatest vigilance is observed to destroy and bury any animal when a suspicion of infection exists. The dealers have for some time past avoided the Prussian route, and take their goods to Russian ports, particularly to Liban for shipment; and Russian hides and calf-skins which formerly went through the Prussian ports, all go that way now. I may add that the hide and calf-skin export, which was formerly of great magnitude to Great Britain, has now taken a different channel. The skins go now almost all to Lübeck, and from thence to Frankfort-on-the-Maine, or to Stettin, and from thence to Berlin, &c.; and it is not impossible that the infection may be carried to the heart of Germany by these means, although the precautions of the Prussian Government may have warded it off from the eastern frontiers. I have never heard that live cattle have been shipped from the Baltic ports. The disease is reported to be a violent purging and sudden death. I have, &c.

(Signed) "W. J. HEETSLET.

"The Earl of Clarendon."

"Foreign Office, March 31, 1857.

"Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Committee of the Royal Agricultural Society, copy of a telegraphic despatch from her Majesty's Consul at Memel, reporting the symptoms of the murrain amongst the cattle. I am, sir, your most obedient humble servant,

"E. HAMMOND.

"Jas. Hudson, Esq."

"From Consul Campbell to the Earl of Clarendon, dated Memel, March 30, 1857.

"Animal loses appetite. Body trembles. Gums inflame.



Eye dull with discharge. Food becomes powder in stomach. Severe diarrhoea. No cure discovered. Eight days dead."

" Foreign Office, April 2, 1857.

" Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Committee of the Royal Agricultural Society, copy of a despatch from her Majesty's Chargé d'Affaires at Hamburg, stating that the importation of horned cattle from the Duchy of Holstein into the Duchy of Schleswig has been prohibited. I am, Sir, your most obedient, humble servant,

" SHELburn.

" James Hudson, Esq."

" Hamburg, March 21, 1857.

" My Lord,—In the Hamburg *Nachrichten* of this morning there is a paragraph relating to the pulmonary disease that prevails among the horned cattle in these parts, which may be deserving of your Lordship's notice. This paragraph states that the Minister for the Duchy of Schleswig has issued, under date of the 14th inst., a notification that

" As several cases of a dangerous pulmonary disease among the horned cattle still occur at various places within the Duchy of Holstein, and as the measures directed to be taken in the notification of the 23th of July last have proved insufficient, the importation of horned cattle from the Duchy of Holstein into the Duchy of Schleswig is prohibited till further notice." I have, &c.,

(Signed) " G. LLOYD HODGES.

" The Earl of Clarendon, &c., &c., &c."

" Foreign Office, April 4, 1857.

" Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Committee of the Royal Agricultural Society, copy of a despatch from her Majesty's Consul-General at Warsaw, reporting on the cattle disease in Poland. I am, Sir, your most obedient, humble servant,

" E. HAMMOND.

" James Hudson, Esq."

" Warsaw, March 29, 1857.

" My Lord,—In reply to your Lordship's telegraphic message received this morning, I have the honour to forward the information of which I am in possession regarding the cattle-disease, or murrain, now prevailing in Poland and the contemurcious countries.

" The Inspector-General of Hospitals and Health, in this country, published an official report on the subject in the course of last year.

" I find from this authority that the cause of the disease is contagion. It is carried by farm-servants who may have been employed in tending diseased cattle; by dogs which may have had access to their stalls, or have been used in driving them; in short, by any means which would be suggested by a practical farmer. There is a special dread of old hides and hair.

" The disease was never known to originate in Poland. It has invariably been brought by the herds coming westward from the steppes of Russia. It has been known to break out among cattle which were apparently in good health at the end of their journey.

" The symptoms may be stated as follows, although much variation has been remarked in them:

" Cough, gnashing of the teeth, irritation of the skin, staring coat, great irritability of the back. As the disease advances, a thin matter issues from the nostrils and eyes; the irritability of the back increases to excessive pain when the latter is touched. About eight days after the appearance of the disorder, the animal is affected by violent fever-paroxysms, which recur frequently during the twenty-four hours. Dysentery then sets in, the discharge from the eyes and nose be-

comes thicker, but just before death constipation follows. This last symptom does not always present itself.

" Sometimes the disease lasts for as long a period as three weeks; but an animal rarely dies before the eighth day from the first appearance of the disorder.

" It sometimes happens (but the instances are very rare) that an animal may recover, but such cases do not exceed one per cent.

" After death, the second and third stomachs are found in a most inflamed condition, ulceration is apparent, and the foreign matter discovered is quite dried up.

" I learn from the Official Almanac for 1857, published at Warsaw, that large rewards have been offered by the Governments of Austria, Prussia, and Holland for the discovery of a specific to meet this fatal disorder; but hitherto no success has attended this movement. Nearly every remedy has been tried, including salts of different kinds, antimony, mercury, soda, saltpetre, cold water, nux vomica; but all have failed alike.

" The consequence has been the institution of the most stringent Government measures, as I have already brought to the notice of your Lordship (No. 19, Consular, dated March 9, 1857), for the indiscriminate slaughter of all beasts exhibiting a symptom of murrain.

" I am not acquainted with what has been done in this respect in the provinces of Austria; but in Prussia the regulations have been severe, and most sternly executed.

" By a report this day brought to my notice, I am informed that twenty thousand beasts have been sacrificed in Poland since the regulation was published on the 9th of May, 1856.

" Under certain rules a compensation is allowed by Government for each beast so slaughtered.

" Independent of these measures in the interior of the country, quarantine-stations have been established on the Russo-Polish frontier, where beasts coming from the East are detained for three weeks.

" Fat beasts ready for the market may, however, be passed, as I am told, under certain licenses and supervision, along the road. But with regard to this exceptional rule my information is open to doubt.

" Both in Poland and in the Prussian provinces there is a great disposition to exaggerate the reports showing a decrease of the evil. I observe in the German newspapers articles thrown out, from time to time, with the view to influence both imports and exports.

" It is impossible to be too careful when considering this matter, the more particularly as regards all the ports of the Baltic as well as those of the Black Sea, including Odessa.

" It is probable that hides should be viewed with almost as much suspicion as live beasts coming from the countries infected. So strongly is this point regarded by the Russian and Prussian Governments, that the regulations prescribe the burial of the slaughtered animals, quick-lime being thrown into the pits. I have, &c.,

(Signed) " W. R. MANSFIELD.

" The Earl of Clarendon, &c., &c., &c."

" P.S.—I observe that I have accidentally omitted that one of the symptoms of the disease is the loss of the faculty of rumination."

" Foreign Office, April 4, 1857.

" Sir,—I am directed by the Earl of Clarendon to acknowledge the receipt of your letter of the 2nd instant, acquainting his lordship with the intention of the Council of the Royal Agricultural Society of England, in conjunction with the Societies of Scotland and Ireland, to send Professor Simonds to those districts abroad where the disease among cattle is at

present raging; and I am to enclose a letter which has been addressed, by Lord Clarendon's direction, to the British consular agents in Northern and Central Europe, instructing them to afford to Professor Simonds all the assistance in their power in carrying out the objects of his mission.

"I am, sir, your most obedient, humble servant,

"Jas. Hudson, Esq."

"E. HAMMOND.

"Foreign Office, April 9, 1857.

"Sir,—I am directed by the Earl of Clarendon to transmit to you, for the information of the President and Trustees of the Royal Agricultural Society, the accompanying copies of despatches relative to the cattle disease, which have been received from her Majesty's Ministers at Vienna and Berlin, and from her Majesty's Chargé d'Affaires at Copenhagen.

"I am, sir, your most obedient, humble servant,

"J. Hudson, Esq."

"SHELBURN.

"Vienna, April 1, 1857.

"My Lord,—With a view to avoiding references and to shortening official delays, I have not hesitated to allege the urgency of the case, and to address myself to the Minister of the Interior, with a view to obtaining all the information which his Excellency could afford respecting the nature and treatment of the cattle disease which has exercised such fearful ravages in Germany.

"Baron de Bach entered very kindly into my views, and in great haste caused the collection of papers\* to be made, which I beg to forward to your lordship.

"As days and weeks would be required to translate these documents, I have no alternative but to forward them, with the Minister's letter, as they reached me yesterday evening from his Excellency.

"The attention of the Minister of the Interior having been much turned to the cattle disease, I was eager to converse with him on the subject. The following are the heads of his explanations:

"The disease comes invariably from Bessarabia, where it appears to have its permanent seat. It is in the nature of consumption, is very dangerous, and is in the highest imaginable degree contagious. A man passing from a diseased to a healthy stable would carry the disease with him, though himself in no way affected by it. The same observation applies to any animal, as a dog or cat. They equally would transport an infection which has no influence upon them. Such, indeed, is the disposition of the disease to communicate itself, that it has been ascertained that cattle have become infected from treading, on the high-road, upon the dung of infected beasts which had passed some time previously. The malady is found in a considerable degree amenable to medical treatment; but, in the first instance, the best course appears to be the free use of the knife and hatchet as soon as the disease is perceived at any point. The infected animals should be instantly burnt, as well as despatched, the skin and hair being certain to carry infection with them. If, in despite of precautions, the disease should spread, then, of course, treatment must be substituted for the axe; but, equally, the stables in which the sick animals are placed must be at a distance from all others, and the persons charged with their care not permitted to visit any other. With vigilance, and the adoption of prompt measures in the first instance, Baron de Bach is of opinion that no great anxiety need be felt, even if the disease should be introduced into England.

"I have, &c.,

"(Signed)

G. H. SEYMOUR.

"Earl of Clarendon, K.G."

\* Sent to Board of Trade."

"Vienna, 3rd April, 1857.

"My Lord,—I beg to notice to your Lordship the following statement, which I translate from a newspaper of this date:—

"The murrain which has been introduced into Silesia by means of a diseased herd is confined as yet to the oxen which have been bought from among this herd.

"As the whole of these beasts are put into the strictest quarantine, and as the axe is resorted to as soon as there is any appearance of disease among them, well-grounded hopes exist of its being found possible to destroy the pestilence in the bud? (Keimen).

(Signed)

"I have, &c.,

"G. H. SEYMOUR.

"Lord Clarendon."

"Berlin, April 4, 1857.

"My Lord,—With reference to your Lordship's telegram, recorded in your despatch No. 146, of the 31st instant, I regret to say that, notwithstanding my reiterated endeavours to obtain the detailed information as to the cattle disease, required by her Majesty's Government, I am as yet unable to forward it. It is promised to me shortly, and I hope to receive it in a very few days.

"I cannot learn that any remedy is known against the malady, and am assured that the course here pursued, on its appearance, is to kill all the cattle that have been in contact with the diseased animals, and to bury them 8 feet under ground.

"I have, &c.,

(Signed)

"BLOOMFIELD.

"Lord Clarendon."

"Berlin, April 4, 1857.

"My Lord,—Since addressing to your Lordship my despatch, No. 183, of this day, I have received the enclosed communication from Baron Manteuffel in reply to my pressing demands for information relating to the cattle disease in Prussia.

"His Excellency states that the disease has shown itself in the district of Breslau and of Apolln, but that up to the present moment no case of disease of any sort among horned cattle has occurred in any other Prussian province. His Excellency further states that, as regards the two localities above named, the most effective measures have been taken to arrest the disease, and that, judging from the experience of last year, there is every reason to hope that its propagation will be prevented, and its extinction finally secured.

"In his second note Baron Manteuffel states that, as some time may elapse before he is enabled to furnish me with all the detailed information on the subject which I have requested, his Excellency transmits without delay the official regulations which have been published by the Prussian Government at various periods, for the prevention of the propagation of the disease among cattle, and which have only reached me in original to your Lordship by this messenger.—I have, &c.,

(Signed)

"BLOOMFIELD.

"Lord Clarendon."

(TRANSLATION.)

No. 186 (1).—The Baron Manteuffel to Lord Bloomfield; Berlin, April 4, 1857.

"Your lordship having on the 23rd of last month expressed a desire to obtain for the Board of Health, in London, official information on the contagious diseases which are at the present time raging among the cattle of Prussia, I have the honour to state to your Lordship, in reply to this request, that the epizootic has recently been announced as existing at Fürstenu, a locality within the circle of Neumarkt, in the district of the regency of Breslau, and at Pouischowitz, a village within the circle of Tost-Gleiwitz, in the district of the regency of Oppeln. In no other province of the Prussian

monarchy, as far as is known at the present moment, does there exist any devastating contagious disease among the horned cattle. In reference to the new appearance of the epizootic in the two localities mentioned, the most effective measures have been taken to combat the evil; and, after the experience gained during the past year, there is also every reason to hope that success will continue to attend those measures, and that the propagation of the disease will be prevented."

(TRANSLATION.)

No. 186 (2).—The Baron Manteuffel to Lord B'oomfield, April 4, 1857.

"In referring to my letter of this day, in reply to the one which your Lordship had the goodness to address to me on the 23rd of March, I have the honour to state that your Lordship's communication of the 3rd of March—in which a desire is expressed to be informed of the progress of the epidemic in Prussia, the measures which have been taken against that scourge, and the result with which those measures have been attended—has been enclosed to the Minister of Public Instruction and of Medical Affairs, with a request that he will direct the requisite information to be obtained on the subject of your Lordship's application. As some time, however, must necessarily elapse before this information reaches me, I at once enclose to your Lordship two important documents which have reference to this subject: namely, (1), The Patent of the 2nd of April, 1803, and the Ordinance of the 27th of March, 1836 (which forms a complement to it); and (2), a copy of the Cabinet-order of the 15th of November, 1814, enacting, for wild-breed cattle only, the precautionary measures prescribed by § 14 of the Patent of 1803, for the introduction of horned cattle into Prussia.

"For the purpose of combating the epizootic, the Government has ordered every animal to be at once killed on its being actually attacked by the disease, or suspected only of its having taken it. The carcasses are buried, and covered over with dry lime, after the skin has been cut into pieces in such a manner as to prevent its being used for any ordinary purposes. At the same time all communication with the infected localities is suspended, interdicting even cattle markets to be held in their vicinity, as well as every other kind of cattle sale.

"On the frontiers of Poland, where the epizootic caused great devastation in 1855 and 1856, the Government has established a sanitary *cordon*, authorizing, should the case again recur, the suspension of all intercourse with the infected foreign districts; and a similar *cordon* exists at the present moment in Silesia, for the purpose of isolating the *communes* of Fürstenau and Ponischowitz, the only localities in Silesia where the malady has re-appeared.

"By the aid of these measures, by great circumspection and a constant anxiety on the part of the local authorities, the Government has attained the object of restricting the contagion within narrow limits, and preventing its propagation towards the centre of the kingdom.

"I will not fail, as soon as I shall have received the details I am expecting from M. de Raumer, to communicate them, without delay, to your Lordship."

"Copenhagen, April 3, 1857.

"My Lord,—In compliance with the instructions conveyed to me by your Lordship's telegram of the 23rd ult., relative to any information which might be procurable here respecting the disease among cattle, I have applied to the Government, and the veterinary school of this town, for any data which they might be able to furnish me with; but I am assured on all sides that there are little or none to be obtained on this subject.

"The disease, which is called "*lunge segge*" (pulmonary fever) has only appeared once, and that not to a great extent,

in this part of Denmark, in 1849, and has baffled all attempts to cure it; few if any remedies have been applied, and the most efficacious and the only means of checking the complaint, which is highly contagious, has been immediately to destroy the cattle—not only those attacked, but all those suspected of being under its influence. Dr. Fenger, an eminent medical man of this town, and at the head of the veterinary school, tells me that these preventive measures were considered successful at the period above referred to, when the disease broke out in two large farms on this island; but of course when it becomes widespread and general these measures can scarcely be persevered in. In Holstein, where the disease rages to a greater extent at the present moment, there exists the same ignorance as to any medical remedy to combat it; and so much is this felt to be the case throughout the country, that a law was proposed in the Rigzraad, last year, to make the immediate destruction of cattle attacked compulsory, with an indemnity to be granted to the owners. Dr. Fenger tells me that inoculation has been tried, but with no particularly satisfactory results as yet.

"I have, &c.,

(Signed)

"F. ORME.

"Lord Clarendon."

Communications were then read from Mr. Hall Maxwell, C.B., Secretary of the Highland and Agricultural Society of Scotland, and from Captain Croker, Secretary of the Royal Agricultural Improvement Society of Ireland, expressing their willingness to concur with the Royal Agricultural Society in arrangements for despatching a Veterinary Inspector to districts abroad where the cattle murrain is at present raging. The Council agreed to the following resolution:—

"That it is expedient to send a competent Veterinary Professor to examine into the nature of the cattle murrain on the Continent. That the Society gladly accepts the co-operation of the Highland and Agricultural Society of Scotland and the Royal Agricultural Improvement Society of Ireland in this step. The Society ventures to recommend that Professor Simonds, of the Royal Veterinary College, be commissioned to this task. That he be empowered to take with him a German Veterinary Professor, established in London, quite competent for the business, and who would smooth the difficulties of the German language. It is supposed that about three weeks would be required for a satisfactory examination. That the Highland and Agricultural Society of Scotland be informed that the Royal Agricultural Improvement Society of Ireland propose to share the expense of this mission with the Royal Agricultural Society of England; and that they be asked to join in the same manner."

**POLLED BULL.**—The Council accepted M. Dutrône's offer of a gold medal, to be awarded under the regulations of the Society, as a premium for the best polled bull exhibited at the Salisbury Meeting.

**COUNTRY MEETING OF 1858.**—Mr. Raymond Barker, Mr. Brandreth, Mr. Cavendish, Mr. Brandreth Gibbs, and Mr. Milward, were requested to form an Inspection Committee, for the purpose of visiting the localities proposed for the Society's country Meeting of 1858 in the North-Wales district, and of reporting to the next Monthly Council on their suitability, or otherwise, for that purpose.

**GUANO DEPOSITS.**—In the evening Professor Way, the consulting chemist of the Society, delivered an interesting lecture on the localities where deposits of guano

had been discovered, and on the conditions under which they were found to occur. The lecture was illustrated by numerous physical charts, showing the direction of the winds, the currents of the ocean, and the limits of the rainless regions: on which he pointed out the various districts referred to in the series of important despatches forwarded to the Society from the Foreign Office, through the instructions of the Earl of Clarendon. He exhibited curious specimens of guano in the progress of conversion from an organic into a mineral substance.—On the motion of Lord Walsingham, seconded by Mr. Fisher Hobbs, the best thanks of the meeting were voted to Professor Way for his useful lecture, with a hope that it would call public attention more strongly to its important subject, and produce a full effect in that direction. On the motion of Mr. Druce, seconded by Mr. Ramsay, the best thanks were also offered to Mr. Lawrence, for his kindness in presiding on that occasion.—Mr. Hudson (of Castleacre) called attention to the obscure but important subject of *nitrification*. He found in his own practice, that farm-yard manure exposed on the land for a few months, acquired either from the atmosphere, or from some chemical change going on among its own elements, or from some other source or cause to him unknown, a remarkable addition to its manuring properties, as evidenced by the resulting crop to which it was applied, in comparison with the same manure at once ploughed in without such previous exposure.—Mr. Fisher Hobbs hoped the day was fast arriving when farmers would be more alive to the value of their home-manure, particularly to the importance of fish, especially that from the Irish coasts, applied to the land as manure in a prepared dry state.—Professor Way remarked that guano was only the digested carcasses of fish.

DISCOVERY OF GUANO.—The Earl of Shelburne, by direction of the Earl of Clarendon, transmitted to the Society the following communication:—

“Foreign Office, March 31, 1857.

“Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President and Committee of the Royal Agricultural Society, copy of a despatch from her Majesty's Consul at Porto Rico, reporting the discovery of 25,000 tons of guano in the Island of Mona.

“I am, Sir, your most obedient humble servant,  
“Jas. Hudson, Esq.”

“SHELburne.

“Puerto Rico, Feb. 16, 1857.

“My Lord,—In the Island of Mona, situated about fifty miles nearly due west of the town of Mayaguez, at the western extremity of the Island of Puerto Rico, some deposits of guano have been discovered, and according to the report of the surveyors appointed by this government to inspect the deposits, a copy of which I have obtained, the guano is situated in three caves, and the quantity is said to amount to 23,525 tons. I regret that I am unable to state the proportion per cent. of ammonia contained in this guano, as I have not yet succeeded in procuring a sample, nor have any steps been taken by the government to ascertain this fact, upon which the value of the discovery depends, the samples brought by the surveyors having been forwarded to Madrid. A tolerably correct estimate of its properties, however, may be formed from the circumstance that a cargo taken by the master of a merchant vessel under the flag of the United States, who was the discoverer of these deposits, realized at New York the sum of 20 dollars, or £4 2s. sterling, per ton. The governor of Puerto Rico is awaiting instructions from the authorities at Madrid as to the manner in which he is to dispose of the guano, which in the meanwhile has been protected against further depredations. I have, &c.

(Signed) “LENNOX HUNT.”

ADJOURNMENT.—The Meetings of the Council stand adjourned over Easter week to Wednesday, the 22nd of April.

## THE TURNIP BEETLE.

### LOUGHBOROUGH AGRICULTURAL SOCIETY.

At a meeting of the Loughborough Agricultural Society, at the Plough Inn, on Thursday, April 2, S. B. Wild, Esq., the president, occupied the chair, and there were also present Messrs. T. Allen, Thurmaston; C. Stokes; T. Morris, Bunney; Garton, Cotes; Eaton, Donington; Shepherd, Nottingham; T. Parr, Nottingham; T. B. Miller; W. Humphreys; Rowbottom, Charley; Nicholson, Nottingham; J. Buckley, Normanton; Cumberland, Charley Knoll; T. C. Angrave, East Leake; T. and H. Burrows, Rempstone; Gill, Burton; W. Henson, Hoton; Nuttall, Ragdale; W. H. Briscoe, Broombriggs; W. Hatton, Stanford; T. Marshall, Rempstone; and W. Lowe, Normanton, &c.

On the removal of the cloth, the Chairman proposed the usual loyal toasts, which were duly responded to.

Mr. THOMAS MORRIS, of Bunney Grange, then read a paper on “The Turnip Beetle,” or, what is commonly called, “The Turnip Fly,” with a suggestion as a means for preventing its destroying the young turnip plant. Mr. Morris spoke as follows:—The subject appointed for consideration to-day commands our earnest attention, for I believe it to be of immense importance to all those who may

be interested in the cultivation of the soil; because this troublesome insect in its busy work of destruction has baffled not only practical farmers, but put to silence the theory of scientific men. In opening this discussion it is my intention to cite observations from Messrs. Curtis and Le Keux—who have made entomology their study through life—in order to render us better acquainted with the natural history of the turnip beetle. I shall also make a few remarks upon the habits of this pest, which have come under my own immediate observation, and afterwards suggest a means for preventing its destroying the young turnip plant. According to the entomologist we are instructed that there are at least two species of the turnip beetle, viz., the Striped, and Brassy or Tooth-legged: the latter is not so common as the former, and it appears that scarcely anything is known of the economy of this insect; but it is the striped beetle with which we, as farmers, are so familiar, and upon which I desire more particularly to claim your attention. It has various names in this country, such as the beetle, fly, black-jack, flea, &c., but upon close examination there can be no doubt that it is a beetle, for it has two sets of wings

—the outer ones, like all other beetles—being of a horny nature; and to distinguish it from others of its order, I may observe that its colour is a bright-black, with a light-yellow coloured stripe down each outer wing. Mr. Curtis, who has so ably contributed to the *Journal of the Royal Agricultural Society of England*, in his observations on the natural history of insects affecting the turnip crop, informs us that this beetle belongs to the order *Coleoptera*, from its wings being folded beneath two horny cases; it is included in the family *Chrysomelidæ* or golden beetles, for certain scientific reasons in conformity with its structure, and is one of about one hundred species forming the genus *Altica*, so called from the great powers they have of leaping; it is readily known by the thickness of its thighs, which give it the power of leaping, like fleas, to a prodigious distance, considering its small size. Eighteen inches is about the greatest extent of its leap, which, in a straight line, would be, averaging its stature, two hundred and sixteen times its own length; and, when it is remembered that this leap is performed in a curved line, it must be admitted that a considerably greater distance is achieved. Mr. Le Keux states that “the female, which is larger than the male beetle, lays but few eggs, compared with other insects; and that it requires a period of about thirty days to carry the animal through its various stages up to the time when it becomes a perfect beetle again—viz.: It remains an egg ten days, a maggot six, and a chrysalis thirteen days. The eggs are deposited on the under-side of the turnip-leaf; and when they become maggots, they immediately begin to eat through the lower skin of the leaf, and form winding burrows—as will be seen from the drawings on the table—by feeding on the pulp. They are full fed in about sixteen days, when they desert these burrows, and bury themselves not quite two inches below the surface of the earth, where they become immovable chrysalides, which are brought to maturity in about a fortnight, when the beetle—or fly, as it is called—emerges from its tomb again, to fulfil the laws of Nature.” One pair of these insects produces five or six broods in a season. They are rather long-lived, and are found, during the inclement months of winter, under the bark of trees, and similar sheltered places, in a torpid state. It is a perfect wonder, to the naked eye, how this pest can, in a short space of time, commit such destruction on the turnips, because its dimensions are so small; but when highly magnified, this idea is at once dispelled, for it is then seen that Nature has provided it with formidable weapons, whereby it is enabled to obtain its sustenance. We are told that it is found in most parts of the United Kingdom, and in many countries on the Continent; indeed, I have been informed that it has been known to destroy turnips in North America. The general habits of this beetle appear to me to be most remarkable and eccentric; for when the weather is excessively hot, with a bright sun, it is then in a very lively and active state; and it is at this time that it commits such fearful ravages upon the young turnip-plant. Again, if the weather should change, and become cold, cloudy, or stormy, its activity ceases, it then sheltering itself either under the leaf of the plant, or in the crevices in the ground, where it is found in almost a torpid state; but, upon a burst of sunshine, it quickly returns to its work of destruction. The voracity of this insect is incredible; for in some seasons it has visited the turnip-fields in such countless numbers, that it has been known to entirely destroy a crop of turnips in a few hours. There is a very strong odour proceeds from the young turnip-plant; and, the olfactory

members of these beetles being very acute, they quickly discover the field where they are growing, frequently against the wind. To corroborate this, I will repeat what is recorded by Mr. Le Keux, who states that “in May, 1836, when the thermometer was at 75 degrees in the shade, during a south wind, great numbers were on the wing, and all proceeding southward; and, again, that eight acres, forming the summit of a hill in Devonshire, were sown with turnips, and when the young plants were just rising above the ground, the wind being for more than a week at south-east, wafting the scent to the north-west, they were so destroyed on this side that nearly an acre was bare, whilst the south-east side was not touched until the plants had attained a size to render the attacks of the beetle of little consequence.” This extraordinary insect attacks the turnip plant from the earliest stage of growth, continuing its ravages until the two first leaves are destroyed, leaving only the bare stem; and it is an undisputed fact that when the first-sown turnips are taken, those sown afterwards scarcely ever thrive so well unless the ground undergoes the usual system of ploughing, &c., which in most instances would be impracticable, for it would become so late in the season as to render a crop of swede turnips very uncertain. The turnip is the most expensive crop a farmer cultivates, and I may add the most valuable; yet there is no crop which he produces that is liable to so many enemies (Hear, hear), and amongst these none so destructive as the beetle in question (Hear). It is recorded, on the authority of Arthur Young, that in 1786, in one county alone (Devon) turnips to the value of £100,000 were destroyed by this pest: at the period just named very little was known of the Swedish turnip, and as the culture of this root has increased to a great extent, it would be difficult to estimate the value of turnips destroyed by the beetle at the present day. I believe I may assert, without fear of contradiction, that this insect will attack turnips sown in any part of the summer, sown upon all descriptions of soil, and no matter how highly it may be farmed. Yet there is good reason in having the land in a high state of cultivation; this, with a proper amount of humidity in the atmosphere, is what is most essential for the rapid and healthy growth of the plant (Hear), quickly forcing it into rough leaf, when it would be out of further danger from the beetle; and it is my opinion that turnips sown upon land in bad condition, or not properly drained, scarcely ever recover from the ravages of this insect, because they cannot make that advancement which otherwise in many instances would effect their safety. There are very few farmers whose crops of turnips have not to a greater or less degree suffered from this plague; hence the desirability of consulting together to devise some means for preventing its destroying the young turnip plant. Many and varied have been the attempts made to preserve this plant from the attacks of this insect. I will relate a few which have been tried by others to endeavour to effect this purpose. Some of my friends have steeped the seed, a few hours prior to drilling, in a mixture of the tincture of assafoetida and urine, believing that the plant will be impregnated with the abominable odour proceeding therefrom; but although this has appeared to succeed in some instances, yet I know that there have been seasons when the beetles have entirely destroyed the crop. For my part, I cannot conceive this plan to answer, for if you drill the seed after saturation it will no doubt vegetate; but if the weather should prove dry and the soil likewise—which frequently occurs at this period of the year—it would then cease to grow. I have heard of farmers mixing the turnips with radish seed, expecting the beetle would prefer the latter, and whilst feeding upon it the former slips by into rough leaf and escapes. My opinion is that there is no plant

in cration which the beetle would prefer to the turnip, and as this wary insect is found in most parts of this country, how is it that we do not hear of the radishes being destroyed by them in the gardens, &c.? Some farmers drill every alternate row of swedes with common or white-top turnips, believing the beetle to prefer the common turnip, and, whilst feeding upon them the former would grow out of their way. In advocating this plan it would add expense and trouble, and in my opinion no beneficial result would ensue. Again, others adopt the following: after the plants are up they apply either soot, lime, or chalk; this I do not consider a practicable remedy, for when a heavy thunder-storm comes, these applications would be washed off the plants and the effect forthwith destroyed; and, moreover, either of the before-mentioned, on being sown broadcast, and alighting upon the leaves of the plants, checks the growth of them materially, and we are instructed by Mr. Le Keux "that if the upper portion of the leaves could be poisoned, the beetle would feed on the under side of the same with impunity." In many parts of the country, farmers drill a double, and in some instances a treble quantity of seed; these advocates say "Sow plenty of seed, and you are sure of a crop." I have permission to mention that last season Mr. Thos. Dickens, a very practical farmer, residing at High Oakham, near Mansfield, drilled 4lbs. of seed per acre, and his crop was entirely destroyed by the beetle. I have been informed that last season also, an eminent agriculturist in the neighbourhood of East Retford, whose general practice is of drilling 6lbs. of seed per acre, had his crop destroyed by this insect. The quantity of swede turnip-seed generally sown per acre is about 2½lbs., but 1lb. of clean, good, new seed is ample to produce a fair crop, providing it can be preserved from the enemies which affect that plant. Practical farmers well know the disadvantages attending drilling too much seed; first, the plants always grow weaker, and, being so very thick, it renders the operation of singling them out much more expensive; and secondly, the tap-roots entangling round each other, it is very difficult to cross them properly with the hoe. I will allude to another remedy which is spoken of by Mr. Curtis: he states "that if a field sown with turnips is surrounded by a bed of mangold-wurtzel, the beetles would not fly near the field." I presume that it is supposed by the entomologist that this plant is offensive to the beetle. In reply to this I will give you an illustration of what occurred upon my farm last season. I planted a field with mangold-wurtzel, and found many places where the seed did not vegetate; these I filled up with swede turnip-seed, and when they came up they were as eagerly devoured by the beetles as though the field altogether had been turnips. Scientific and theoretical men cannot be so well acquainted with the practical bearings of agricultural operations as farmers themselves; yet I do not desire to speak disparagingly of theory, but on the contrary wish to award its full value; for in studying that branch of science and applying the information derived therefrom to practice, we are enabled to produce such results as will prove beneficial, not only to ourselves, but to the country at large; for it is science combined with practice that has placed England so prominent amongst the nations of the earth. The suggestion which I propose to introduce to your notice is one which I have the greatest confidence in believing will prevent the beetle from destroying the young turnip plant, and will undertake to say that it shall never fail in having the desired effect if used at a proper time (Hear). The operation consists in propelling a machine—a model of which I have before me—over the turnips as soon as the beetles are discovered, and persevering for a few days, when immense numbers of them would be caught, and the remainder

so disturbed that it would be impossible for them to injure the plants. I have used it with great success upon my turnip crops, when many farmers in the neighbourhood were compelled to sow a second time. It is simple in construction; light, yet durable, and effective in operation. It consists of a frame for the most part made of tubular iron, which may be elevated or depressed by the action of the lever on the centre bar, so as to adapt it to work in turnip fields, either ridged, drilled upon the flat, or sown broadcast. The front part of it is covered with canvas, the under side of which is smeared over with a very adhesive chemical preparation, and by passing the machine over the plants at a proper elevation, upon a bright sunny day myriads of them would be caught, the beetles springing from the turnips and adhering to the preparation, from which it would be impossible for them to extricate themselves. In leaping they jump horizontally, but the height they spring from the plants varies according to the weather. When first I used this machine I had the canvas placed over the whole frame, but where one insect was caught on the hinder part, hundreds were found on the front. The slots and screws at each end of the side bars are for the purpose of keeping the canvas constantly tight; for when the sun is excessively hot, it is apt to expand, when it would come in contact with the soil, thereby at once destroying the effect of the preparation. By passing the machine over the plants nearly all the beetles jump from the turnips; but there are a few, which, being so cager at work, will not stir upon the approach of an enemy. In order to remove the latter and entirely cleanse the plants of them, there is a succession of curtains which waft or brush them off the turnips. I had thought of introducing a revolving cylinder, with flappers, but upon reflection found it would not be so effective as the curtains. The cost of manual labour would not exceed 3s. per acre, presuming that the turnips from the first attack of the beetle would get into the rough leaf in six days. The turnips, as soon as they appear, should be carefully watched, and when the beetles are first discovered, at once apply the machine; but many farmers being engaged at this time of the year in the hay field neglect this important consideration. These machines are made of various widths, suitable for ridges from 20 to 30 inches. And now, having explained the principle and action of my "Beetle Trap," in conclusion I must say that in bringing this subject before you I have been prompted by the feeling of advancing the interest of my brother-farmers.

The PRESIDENT then made some observations complimentary to Mr. Morris, who in acknowledgment took occasion to refer to the benefits which were conferred upon the farmers of England by farmers' clubs, as enabling them to introduce at their meetings questions for discussion which were most intimately connected with their best interests, and which were then brought under full and profitable consideration.

Mr. T. ALLEN (of Thurmaston) observed that he thought they were deeply indebted to Mr. Morris for bringing this subject before them. It was a question upon which very few of them could offer any observations which would be likely to be of advantage to them, from their imperfect knowledge of the habits and operations of the turnip beetle. It came: they scarcely knew when, or where, or how to prevent its ravages. If Mr. Morris had invented an instrument which would really be of essential benefit, the agriculturists, not only of this, but of other kingdoms also, would undoubtedly be deeply indebted to him (Hear, hear). His own turnips had suffered very considerably at different times from the effects of the turnip beetle or fly, and he was inclined to ascertain with what degree of success he might use the roller over them. For one month he completely despaired of success, but he used the

roller with some degree of effect the first time, and, by repeating the operation his labours in this respect were adequately compensated. He intended to pursue the same plan in the event of his turnip crops being again attacked, as in all probability would be the case, and should also very likely try Mr. Morris's plan (Hear, hear). If the two together were to prove effectual in eradicating and destroying those pests, he should certainly feel himself deeply indebted to Mr. Morris for having brought forward his invention (cheers).

Mr. C. STOKES said he was sure that they would all agree with him that the explanation Mr. Morris had given of the turnip fly or beetle was most satisfactory. He could bear testimony to the observations which that gentleman had made as to the ravages the turnip fly had committed, and was convinced that any plan which would enable them in any measure to overcome these ravages, would be a real and essential benefit to the agricultural community at large. He was satisfied that great things might be accomplished by the application of the instrument which Mr. Morris had laid before them in extraordinary seasons, when there was a great deal of sun and the insects attained their full development. At the time when they were likely to destroy the crops, he had no doubt the instrument, if applied, would be of material advantage to ensure their destruction. He concluded by proposing the health of Mr. Briscoe, and expressed a hope that that gentleman would give them some information as to how he obtained so excellent a crop of turnips last year, when many others suffered to such a great extent (cheers).

Mr. BRISCOE returned thanks, and remarked, in answer to Mr. Stokes' request, that he considered deep ploughing, in the first instance, and strong manure, very essential to procure a good crop. His turnip plants were attacked by the fly at one time; and in order to remedy the evil, he inserted into the ground long rods, and attached to them guano bags, which were besmeared with a preparation of assafœtida. This preparation was supplied twice a day until the plants had progressed sufficiently to escape the ravages of the fly.

Mr. STOKES then proposed the health of the president of the association, a gentleman who, he said, was ever ready to support them in their operations, and impart to them valuable information on agricultural subjects. They were exceedingly happy to see him amongst them, and would drink his health with right good-will (cheers).

The PRESIDENT, in acknowledgment of the compliment, said it was always very gratifying to him when these occasions arrived, because they then had an opportunity of meeting together, and engaging in the discussion of questions which deeply affected the vocation with which they were connected; and he was persuaded that it was by discussion, by the interchange of thought, that they were enabled to develop a better practice than that hitherto pursued. He would appeal to their judgment and experience to say whether there had not, even within the limited experience of the youngest person among them, been a degree of improvement and success achieved in their agricultural vocation, which their ancestors had no idea of, and of which consequently they had no record. The soil of this country had produced during late years at least half as much more than it did forty or fifty years ago. He referred particularly to the rotation in cropping, and to the advantages which were secured by the adoption of this system of husbandry. The most important of their crops, according to the system pursued at the present time, was that beginning the rotation, namely, the turnip crop. If they succeeded in getting a good crop of turnips, there was every probability of securing a succession of good crops afterwards. But the great enemy the farmer had to contend with was the turnip fly,

Its natural history was but little known, and therefore it was desirable that they should consult those who had studied it as a science, that they might be the better acquainted with its habits, and, as a natural consequence, the better prepared to meet its ravages. He had therefore since he entered that room requested that a book on "The arrangement of British insects" should be added to the agricultural library, in order that every gentleman might have an opportunity of studying the subject. Mr. Morris had kindly laid before them what would very probably—for he (Mr. Morris) spoke from experience—have the effect of destroying a good many of those insects when they were the most destructive to their crops. He said, and he had "Curtis" for his foundation—a man who had rendered great service to agricultural society—that there was some plan of catching these insects by means which he proposed. Mr. Briscoe had stated that he had used, with great success, an application of assafœtida; but this plan was not, according to Curtis, who spoke from experience, a sure protection. It had also been reported that lime, and soot, and other expedients had been equally successful; but if, by the instrument Mr. Morris had laid before them, they could catch the insect, they were then certain to destroy its power of evil. The president then referred to the natural history of the turnip-fly, and concluded by remarking that, if the implement produced would have the effect of extirpating it, they would have great cause for thankfulness.

The CHAIRMAN then proposed the health of Mr. S. Parr, of Nottingham, who, in returning thanks, testified to the great advantages secured by the use of Mr. Morris's invention, over the plan pursued by Mr. Briscoe, inasmuch as in the former case the insect was destroyed, while in the latter it was only prevented from effecting its ravages by being for a time harassed. One plan was, no doubt, extremely good; but the other was very much better.

The PRESIDENT then proposed the health of the Vice-chairman, Mr. Humphrey (cheers).

In returning thanks, the Vice-chairman observed that he had been very greatly interested by the treatise which Mr. Morris had read before them that day. If Mr. Morris's plan were to be found successful he was sure they would all be still further indebted to him; but he was somewhat at a loss to know how long the adhesive preparation would remain on the canvass in dry dusty weather.

Mr. MORRIS replied that if there were much dust, of course the application would necessarily require to be repeated. There was another thing to be considered—the excessive power of the sun would liquefy the preparation, the expense of which, however, was so very trifling as to be really unworthy of consideration.

Mr. HUMPHREY then expressed his opinion as to the superiority of his plan over that of Mr. Briscoe's on the grounds referred to by Mr. Parr.

Mr. ALLEN then proposed the health of Mr. Augrave.

Mr. ANGRAVE returned thanks. He was of opinion that Mr. Morris's invention was likely to be very useful.

It was then resolved "That the thanks of this meeting be given to Mr. Morris for the able manner in which he had introduced to them the implement for the destruction of the farmer's greatest enemy to his turnip crop, and the explanation he had been pleased to offer in connection therewith."

The proceedings then terminated.

[Mr. Morris elucidated his lecture by a model of the machine.]

## THE WILLOW:

WHO CAN CULTIVATE IT, AND WHAT IT MAY BE USED FOR.

It is generally by comparison that the great mass of us judge, whether of economical results or preliminary processes, either of cultivation or the manufacture of its products. I may be allowed, therefore, to state what I have seen of the osier willow and its handicraft applications in England. This will appear the more judicious, before alluding to what may be done here at home, because we derive not only what knowledge we have of its value, but even the plant itself, from thence.

In England, the willow is manufactured, in a peeled state, into domestic clothes-baskets, rocking-cradles for children, hand-baskets for picking apples, butchers' or meat-baskets, bakers' or bread-baskets, chair-bottoms, children's or small chairs, small hand-baskets for eggs, &c., and a great variety of other purposes which I need not enumerate. The split willow is used principally for toys and ornamental purposes, ladies' baskets, &c.; and it is used in the latter form for enclosing bottles or glass-ware intended for pocket use, and for conveyance in a more secure form to places more or less remote.

It is to purposes for which it can be converted in its natural unpeeled state, and situations in which it can be grown, that I wish particularly to invite the attention of farmers.

So easily cultivated is the willow in England, that they there grow it extensively—as I have seen it in the valley of the Severn, and other places—in cuttings where the top soil has been taken away to form embankments for roads and canals, and where clay has been taken for brick and tile-making, &c. In such situations, the roots of the willow-bed are under water for three months of the year; from which it may be safely inferred that localities in which it can be submerged, or flooded, in the spring, will be most favourable to the rapid growth of some, at least, of the several sorts. Varieties of it can be grown on moist land, anywhere, without flooding; but the same can, without doubt, be raised more rapidly with: and it is, therefore, more appropriate, where such situations can be secured, to use them for the propagation of this simple but useful tree.

I have seen it, in some of its varieties, used for purposes but little thought of here, and cut from trees, but for which, or more useful fixtures (a fence may generally be considered a fixture), it may be applied, especially where fencing material is getting "small by degrees, and beautifully less,"

as in many localities in this great West, with great convenience and advantage: and the rapidity of its growth is a high recommendation to its cultivation, whether for fencing or other purposes. In the districts where what is called the "Worcester hop" is grown—which, notwithstanding the name, is principally in the county of Hereford—the willow is extensively used for hop-poles, which are from fourteen to twenty feet in length; also for hedge-stakes, which are driven into the ground, as well as the hop-pole: and these situations both, in that moist climate and soil, are tests of its durability, the stakes being for the purpose of interlacing the thorn and other hedging material around and between, thus stiffening and strengthening the fence till it becomes an impassable barrier.

Now, if varieties of the willow can there be grown so large, why may it not be grown, in moist localities, where, like the common poplar, elm, black ash, &c., it can elaborate the moisture necessary to its composition with equal facility and advantage, in these States, where so many varieties of soil, moist and dry, are afforded, and where at least several of the smaller varieties have been quite successful?

What is called the "Etheredge willow" is said (I have not seen it in the West) to be a large and quick grower, and is probably a variety of the large kind to which I have alluded; and if so, it can be grown with advantage and economy, and to supply a great necessity for fencing purposes—as middle poles, used under the rider to stop sheep, &c., and for stakes and riders in our common rail-fence, as well as for stakes (which, if put in early in spring—the stakes—would certainly grow), and top poles for sod or ditch-fence in swamps and marshes.

That the willow is durable, is well known by the lasting qualities of the manufactures of its cultivated varieties; and even the wild growth of our swamps is used for, and known to make durable fence-stakes.

I have called a large variety of the willow a "tree." This variety is similar to that which has been described in the papers as growing large enough for hop-poles in two years, and suitable for cradle-handles, &c., &c. This tree variety is grown readily on the margins of streams, stock water-ponds, fish-ponds, lakes (artificial or natural), mill-ponds, and in swampy and springy places; and there is an abundance of such among us, and it flourishes rapidly.



It is propagated by cutting poles two inches and upwards through, and from twelve to fourteen feet long, and inserting them, by means of a bar, from eighteen inches to two feet and a half deep, according to the texture of the soil, and the permanent supply of moisture to the imbedded end of the pole. The poles are cut in winter, before the sap starts, for this purpose, and, in this climate, should be kept from thawing till the frost is out where they are intended to be put, and then set out with a bar, as stated. It is necessary to tie some rough material, as locust brush, old raspberry-bushes, or other brush, to keep stock from rubbing them the first two seasons, when they will have become securely rooted, and thus far out of danger.

It is desirable to leave a few inches of one or more branches, where the pole is cut off at the top, to make a wide-spreading head for the tree. At two or three years from setting out, the pole, or tree-head, is cropped, or cut off as level as can be done (level, to prevent the sap from going too much to the central or leading branches), and the crop, or poles and brush, used for pea-brush, bean-poles, brush-drains, for which it is excellent, and for faggots, or bundles of brush for summer fuel, kindling wood, &c. The smaller branches or twigs of the tree sort, also the osier, are excellent for tying on the protecting material for the poles, and tying up the brush, so that it may be taken, when wanted, with facility and expedition. At this stage of its growth, a head of considerable size and breadth—say from ten to twenty inches, according to the number and spreading of the branches when the pole-head was cut—will have been formed.

Now for the practical benefit or result. At five, seven, and nine years from the first cropping, and in a greatly-increasing proportion from many successive ones, poles large and long enough, strong enough, and durable enough for stakes, hop-poles, top-poles, and riders, and of size sufficient to split for hurdles or portable fence, may be cut in large quantities, and, by a dexterous hand and sharp axe, with all desirable speed, and all with sufficient economy of labour and expense to satisfy every reasonable expectation, and even to gratify the most fastidious.

In addition to the uses I have enumerated, it may be made to subserve those of wind-breakers, and excellent fencing material for our marsh and moist lands, planted on the banks, and constituting a beautiful fringe, which, with rows of trees of the large sort at intervals of twenty feet (they will require this distance at least; for I have seen the solid level head four feet broad after cropping, and the head-growth fifteen feet in diameter), will add variety and beauty to the scenery, and ne-

cessary conveniences and worth and value to the farm.

The osier can be fabricated, unpeeled, here, as it is in England, into a great variety of useful basket-ware and packing-cases, such as fruit, potato, and corn-baskets; crates for packing crockery; vegetable and poultry-baskets of any required size, to be sent to market or other distant places. For fruit and vegetable-baskets, and, in brief, for packing all quickly-decaying substances, requiring access of air, it is admirable; and in the summer season, they would be very convenient for sending perishable goods from the Western States and other distant points to the New York market. For corn-baskets it will be admirable, and very cheap, and also for baskets to feed cut straw, roots, &c., to stock; and the large or small kinds would make a good wattled fence for poultry-yards, &c.

As I have stated, it is extensively used in England, unpeeled; and I think it correct to say that full half the whole growth there is manufactured without peeling; and there is no reason why as large a proportion, besides the addition of the large sort, may not be fabricated in the same state by us.

The proportion in which farmers should plant may be to some extent variable; but I am preparing to set out half-a-rod of willow and Lombardy poplar together, in nursery rows, to every acre of marshy land I have to fence (Yellow Locust I have prepared in the same proportion, for upland fencing material); and I would earnestly urge every farmer to establish these necessary stated points now; for I am confident—having good personal reasons to be so—that, besides willow manufactures, we can mature a system of hedge-fence that will be sufficient for our entire ordinary wants and purposes, with materials already successfully and extensively grown in these States; and if farmers will now set out nursery-plats of the willow, Yellow Locust and Lombardy poplar, they will in two brief seasons have the material with which millions of acres may be enclosed, within four years, with the rudiments of substantial fencing, thus adding value to the soil, beauty and variety to the landscape, increasing the general value of land, and, by saving the needed material of fuel and fencing, realizing the injunction, "Put money in thy pocket."

I need not specify who can manufacture willow-ware, or where it can be done; for it is so simple an art, and so easily performed, that almost every one with any handicraft or skill, and every homestead, are abundantly suited to economical conversion.

J. W. CLARK.

*Marquette, Wisconsin, U.S.*

—The Country Gentleman.

## THE UNIFORM SALE OF CORN BY WEIGHT OR MEASURE, AS CONSIDERED WITH A DECIMAL SYSTEM OF COINAGE.

The attention of agriculturists appears to be very strongly directed at the present moment to the anomalies existing in the practice of selling corn by various quantities, all passing under the denomination of bushels; and to the general question whether it should not be sold in all our markets (as it is in some) by weight, instead of by measure. When we say that attention is now directed to this subject, we should speak with some qualification, for the exciting interest of a general election has probably reached the occupiers as well as the owners of the soil. Whether the interest on the subject will survive the interruption, or will die a natural death, remains to be seen. Should it revive after the return of the writs, it is to be hoped it will take a somewhat wider range, and embrace the general question of a decimal system of weights, measures, and money, both money of account and money of circulation. As to a radical reform by the introduction of the French franc as a substitute for the pound sterling, our present monetary unit, and a general equalization of the weights, measures, and money of Europe, if not of the world, it is one of those projects which, however beautiful in theory, would be too inconvenient in practice. The chief advantages would be gained by the merchants engaged in the foreign trade, to whom the reduction of foreign weights, and measures, and money to their equivalent English denominations, is comparatively easy. The introduction of a decimal coinage and a decimal system of weights and measures would, on the contrary, be an advantage to the humbler classes, by placing them on an equality with those who have had greater educational opportunities. It is to be hoped, therefore, that the agricultural body will join the Decimal Association in agitating for the application of a general decimal system. At all events, it is to be hoped nothing may be done which will hereafter throw impediments in the way of the decimalisation of our weights and measures, as well as of our money. We must begin with our monetary system, and proceed to weights and measures when the public shall have been rendered familiar with decimal arithmetic by a decimal coinage. The first step in decimalising our coinage, will be to complete the decimalisation of our money of circulation, by issuing coins of the respective values of the tenth and hundredth of a florin, and ceasing to reissue the half-crowns as they return to the Bank. When the public shall have become familiar with the decimal money of circulation, the next step will be the establishment of a decimal money of account, banishing the shillings and pence from our day-books and ledgers, though they may still continue in circulation, and substituting for them the decimal divisions of the pound. No alterations would be required in the ruling of them. The shillings column would hold the florins and cents, leaving the pence column for

the mills, or whatever name should be adopted for the new substitute for the farthing. That substitute would only be depreciated 4 per cent.

At present we have halted half-way in our advance towards a decimal coinage, by stopping at the florin. The circulation of that coin in conjunction with the half-crown is fraught with much inconvenience. The alteration in the value of the farthing, as affecting the poor man, is no argument against the decimalisation of the pound sterling. The retention of that important unit, on the contrary, is of the utmost consequence, as being the denomination on which all permanent contracts are founded. It is to the shilling, too, not the farthing, that the weekly wages of the labouring classes have reference; and they would soon perceive that 7, 8, or 9 florins are equal to 14, 16, and 18 shillings respectively.

When the public shall have become familiar with a decimal system of money, it will be time enough to proceed to a decimal system of weights and measures. In the meantime it is to be hoped that nothing will be done in substituting weight for measure in the sale of corn, which shall throw additional impediments in the way of a decimal system of weights and measures: for the full benefit of money decimally divided, in facilitating calculation, cannot be obtained without the accompaniment of weight and measure also decimally divided.

In the introduction of a decimal system of weights and measures, as in the introduction of decimal money, the simplest and most practical plan, and that which will produce the least derangement of existing habits, would be the retention of our most important weights and measures, such as the pound avoirdupois, the yard, and the bushel; adopting decimal divisions and multiples of them. The system might not be so symmetrical as the French system, but its introduction would be adopted by the people with great facility, particularly if they had become familiarized with money decimally divided, which would be their best instructor in decimal arithmetic. In dry measure, for instance, we would make the unit the present imperial bushel, dividing it into tenths and hundredths of a bushel, as a substitute for our present pecks and pints. As to the higher decimals, there appears no practical difficulty in the substitution of ten bushels for the quarter instead of eight. The retention of the quarter is the point of importance, if grain is still to be sold by measure: and if it is to be sold hereafter by weight, the bushel becomes comparatively unimportant. The commodities measured by it, besides corn, according to our old books of arithmetic, are roots, fruits, salt, sand, oysters, and coals. With respect to coals, however, sale by weight has long been substituted for sale by measure—and with manifest advantage. The great impediment to the sale of

corn by weight is, that the quarter has become the basis of the tithes rent-charge, and of corn-rents. This difficulty, however, might be easily obviated, by enacting the weight of each description of grain which should be the legal equivalent of a quarter.

As to the measure for liquids, where would be the inconvenience, provided the imperial gallon be retained, if it were divided into ten pints instead of into eight? With respect to that important question, its effects on the revenue from a diminished or increased consumption of intoxicating liquors, it would, perhaps, lead to an increased consumption. The moderate men would be satisfied, it is true, with one-tenth of a gallon instead of one-eighth; while the toppers would take two, and perhaps four, where they formerly took one, and would justify it as necessary to make up for the shortness of the measure.

As regards our linear measures, if the yard be retained, which is a natural standard derived from the length of the pendulum vibrating seconds in our latitude, what inconvenience could result from dividing it throughout by ten, instead of first by three, then by twelve, and then by eight or ten for the eighths or tenths of an inch of the carpenter?

Many conveniences would arise from the substitution of a complete decimal division, for this, though a better would, perhaps, be that recommended, we believe, by a parliamentary committee, viz.,—to make the unit a new measure of four feet, deduced from the present yard, and to be called the elle, dividing that into tenths, hundredths, and thousandths. Then, again, if the mile be retained, what matters it whether it be divided into ten furlongs instead of eight, and whether

those furlongs again be divided by ten? While, to alter all our lineal dimensions for the sake of assimilating them to those of France and the other nations who have adopted the metrical system, would be to derange all existing contracts and habits which have relations to quantity.

For land measure we cannot do better than adhere to the divisions resulting from those of Gunter's scale, viz., square links and square chains—divisions with which all are familiar who have anything to do with the measuring of land, and who, if they have many calculations to make, in which money is connected with areas, have recourse now to decimals, and to tables exhibiting the decimals of the pound, equivalent to a given number of shillings and pence.

On the whole, therefore, we would again urge upon our agricultural friends, who are agitating for the sale of corn by weight, to consider well the advantages of a decimal system of money of circulation and of accounts, in connection with our present most important measures divided decimally, and to agitate for that, or at least not to urge any alteration in the mode of selling corn which will throw impediments hereafter in the way of a uniform decimal system, accommodated to those important units which have become engrafted on all our contracts and habits. Our present mode of dividing them is disgraceful to a civilized age. It is easy to see at a glance that it originated with the Heptarchy.

It will be found that the vexed question of sale of corn by weight or measure was partially considered at the Farmers' Club on Monday, and that it stands adjourned for another hearing.

## EDUCATION OF FARMER'S BOYS, LABOURERS, &c.

Why is it that all classes of citizens, except farmers, consult their best interest by educating their assistants? Every city, and almost every town in our country, has a mechanic's institute for the educating of apprentices during evenings, and most of the cities have mercantile library associations for the improvement of merchant's clerks. Villages have lyceums and lectures, but do farmers attend them? Are not farmers negligent of education? As a general rule, do they even send their own children to school but a small portion of the time? During spring, summer, and autumn, thousands of farmers keep their children from school, and do not even provide books for their use in the evenings. Do farmers generally make the slightest exertion to assist in educating the children of the poor in their neighbourhood? How often do we find traders in large cities who have all the attributes of success except education, and almost invariably they state that their fathers were farmers, and brought them up without the ne-

cessary education to assist them in the prosecution of any business!

We know that there are many noble exceptions to the above, and that here and there throughout the land we may find instances of farmers who feel the liveliest pleasure in educating their children in the best manner, and the children in turn educate the workmen and their families. Many a family who now feel life almost a burthen, after the toils of the day might be rendered happy by a social evening circle, where one might read for the benefit of the whole. Call in the children who are lolling listlessly about the fire, invite the workman, who would otherwise be around the fire of the kitchen or the tavern, and let the farmer, his wife, or the most intelligent of his children, read to the party for one hour every evening; it will soon become a pleasure, in which all may participate. Select such books at first as will amuse, gradually change to the useful, and rest assured that all will be benefited by such practice. Recollect that one hour each

evening for three years is one thousand hours, and know that one thousand hours' judicious reading will educate any one in many of the useful arts and sciences. At any rate, one thousand hours so disposed of by a farmer and his family would render every one of them capable of earning twice as much on the same farm as could be earned by any uneducated farmer, and the necessary books may be had for less money than would pay for the extra amount of nuts and cyder consumed during one thousand hours of idleness by the same individuals.

Each hour so spent is worth six at an ordinary school, and thus may be made to represent a day's schooling. After the habit is once established and cheerfully continued, it is the privilege of the young to learn, and not their task. Besides all these advantages, the constant habit of such evening meetings begets confidence and intimacy, and fathers and elder brothers would cease to be considered as petty tyrants by younger children; the whole moral tone would rise, and farmers would no longer complain of the difficulty of obtaining *good help*.

In a profession calling for severe bodily exercise, a corresponding exercise of mind becomes necessary to ensure good health—we do not mean mere animal health, for the bones and muscles are not the whole man, but he has a head and heart which follow Nature's laws, and become inert if not exercised. What is there on an old-style farm, with a regular routine of succession of crops, farmed and manured in the same way for the last half century, to exercise the man, or that part of him called brain? He follows the plough or the harrow listlessly, unless some new truth as *mind food* has been received the night before, and is being subjected to *brain analysis*. When he meets the evening circle again with the new thought digested, he can explain it to all, and find himself progressed by so doing; his moral state is elevated by elevating others, and all are improved.

How often do farmers direct their sons and helpers to do what perhaps is necessary without ever giving their reasons for so doing, and thus neglecting to instruct others in what they understand themselves? Is this fair-play? Should they place a son with a mechanic to learn a trade, would they not desire that he might be made to understand all the mysteries of his craft? And why not so with the art of farming? Many things are habitually done on every farm, the reasons for doing which are seldom or never explained. Are there not many farmers who do not themselves know why they plough? They certainly know that their crops are improved by ploughing—but why? If the soil is once loosened, why does it not remain always loose? What has the admission of atmosphere to do with the growth

of plants? Does it benefit them, and how? If aye, should not the subsoil receive the same benefit, and if so, by what means can it be disintegrated? If by the subsoil plough, should it be used in wet as well as in dry soil? and, if not in the former, why? Would under-drainage fit the subsoil so that subsoil ploughing would benefit it, and why? After soils are once thoroughly disturbed by ploughing before planting, should they be disturbed during the growing of row and hill-crops, and why? Why are soils more productive when manured? Are all manures equally efficacious? and if not, why? Thousands of pertinent questions suggest themselves, every one of which, if fairly discussed at an evening circle, would outwork the latent energies of the minds of children and working men, adding the observations derived from practice to be registered truths of books, and thus chastening both into useful certainties.

Brother farmers, arise from your lethargy, and determine that every workman and child in your neighbourhood shall at least be made acquainted with all the truths which have been printed in relation to agriculture. We have tried it, and our greatest pride is now to call the attention of visitors to a friend and gentleman on our farm, who had the germ within him awakened by such an evening circle, and who now has charge of our farm. He is not twenty-one years of age, and is capable of working any farm profitably. We do not use the word gentleman to represent either a wealthy, or scholastically educated puppy, but a *man* in the form of his Maker, whose moral code is beyond reproach, and whose self-procured education renders him capable of comprehending the mind-efforts of other men, and of observing Nature's laws understandingly. This always leads to gentleness and the ability of self-government, and a gentleman is the consequence. Aye, a gentleman farmer, be he rich or poor, be he principal or assistant, he is alike a gentleman, and all around him will feel the influence of his advancement. He alone will fail to observe himself as compared with others, except for the purpose of elevating them to his own plane. Would that every middle-aged man in the community would realize to the fullest extent the value of such a gentleman, and would lend his aid to make all others like himself! We only require to comprehend such a character clearly, and at once we duplicate it. Who should be Nature's gentlemen if not the farmers? They own the greater portion of the wealth, and are numerically much the larger class. They stand between their Maker and the portion of creation requiring to be fed by them. What are the merchants, bankers, and other inhabitants of large cities, but the factors and agents of the farmers? They merely sell his produce,

and import the products of other countries for his use. Cities really live by the smiles of the agricultural community, and nothing but the want of education prevents them from taking the relative rank their vocation and usefulness entitles them to enjoy.—The Working Farmer, N. Y.

## THE LONDON, OR CENTRAL FARMERS' CLUB.

### STACKING AND THRASHING CORN.

The monthly meeting was held at the Club House, Blackfriars, on Monday, April 6, Mr. OWEN WALLIS, of Overstone, presiding—supported by, amongst others, the following members:—Mr. R. Baker, Mr. J. Wood, Mr. H. Trethewey, Mr. G. H. Ramsay, Colonel Roland, Mr. T. Owen, Mr. J. B. Spearing, Mr. B. P. Shearer, Mr. W. Spearing, Mr. J. A. Williams, Mr. H. Cheffins, Mr. J. Tyler, Mr. W. Gray, Mr. J. Bradshaw, Mr. R. Franklin, Mr. L. A. Cousmaker, Mr. John Thomas, Mr. J. G. King, Mr. Spencer Skelton, Mr. G. Fidler, Mr. G. S. Harrison, Mr. Hammond, Mr. J. Trimmer, Mr. S. Sidney, Mr. J. Cressingham, Mr. H. Shotter, Mr. C. J. Brickwell, Mr. J. Whaley, Mr. F. J. Wilson, Mr. H. Gibbons, Mr. W. Heard, Mr. W. Eve, Mr. J. Odams, Mr. C. Hall, Mr. J. C. Morton, Mr. J. Ambrose, Mr. G. Cobb, Mr. J. James, &c. The subject appointed for discussion, and standing in the name of Mr. W. BENNETT, of Cambridge, was “The most convenient and economical mode of stacking and thrashing corn.”

The Chairman having briefly opened the proceedings, Mr. W. BENNETT said: The selection of this somewhat antiquated subject for discussion has doubtless subjected us to some little innocent merriment, if not ridicule. One of my more facetious friends, in fact, said to me the other day, “I meant to go to town the very next time, Bennett, to hear you lecture. But you have selected such a subject, *straw* and *straw stacks*! why, what on earth can you make of them? What! do you mean to say that you farmers have not yet decided the question how best to stack and thrash your corn? that you have not learned the A B C of farming?” But my waggish friend, with all deference, was rather too fast, or else not fast enough. We have passed A B and C. For instance, for our present purpose, A shall represent agrarian, the field; B, the cultivation; and C, the crop. Well, having obtained the crop, surely it is of some importance to know what best can be done with it. This, then, is the subject of inquiry for the evening, and on which I am exceedingly anxious to elicit the sentiments of some of the more eminent and enlightened agriculturists that I have now the honour to address. Sir, no observant man can be ignorant of the fact that within the last 10 or 15 years a great revolution has taken place through a considerable portion of the country, as to the manner of dealing with the crops after they are severed from the land, and which has resulted mainly from the use of the portable steam thrashing machine. Like all other great innovators, it has brought with it its good and its evil results. That steam power is nineteen times out of

twenty the most economical that can be employed in thrashing, there can be no doubt; but to its judicious application in the field, after much experience and observation, I am by no means a convert. I mean not as a rule; in peculiar cases it may be allowable. It must be patent to you, Sir, as well as to all that hear me, that we have had of late years some very extraordinary statements put forth as to the very low price at which corn may be thrashed, the calculation being evidently based upon field thrashing, apart from any other expenses incident thereto. Some of these (strange to say) have issued from the Royal Agricultural Society; and, if I mistake not, from the pen of that late excellent man, Mr. Pusey, than whom British agriculture, I feel bound to say, has never possessed a more sincere or attached friend. On this subject, however, that gentleman was certainly a great enthusiast; his zeal in the early adventures of the portable steam thrasher led him into great errors. Corn was to be thrashed, including every expense, at 8d., and even 6d. per qr. But it so happened that about one-half of the legitimate expenses which ought to have been charged were somehow or other left out of the calculation, a practice which is still far too common by parties when making their calculations on this subject—I mean as to the real cost of field thrashing. I admit most freely, if the simple consideration of beating out the corn at the stack in the field, irrespective of what becomes of the straw, chaff, and offal, is only to be taken into the calculation, it may be done with a first-rate engine at a very low price. But, Sir, I appeal to your sober judgment, is this a fair or proper light in which to view the subject? I see some gentlemen before me who are frequently in the habit of valuing the covenants between an out-going and coming-on tenant. Let me for a moment suppose I had to meet one of you far-seeing gentlemen, as watching the interest of the coming-on tenant, and I, on behalf of the going-off man, show you a number of these beastly straw heaps blowing over the hedges and surrounding lands, and your employer had to fetch up every load of straw he wanted for his cattle as best he might, and sometimes over bad field roads; or, if the sight was not absolutely before you, you were led to understand such was the plight in which your client would have to take to the straw of the farm. I appeal to you, if I were to demand the customary price for the brouse and use of the straw, would you not demur and deem me a maniac and fitted for a county asylum, rather than a valuer of farm covenants, and rather demand some compensation for a breach of covenants? If, then, such would be the state of things as relates to the going-off or coming-on

tenant, must it not be self-evident that the man farming who adopts such a system must be a very imperfect calculator of profit and loss? Such a farmer, irrespective of all other considerations, looking simply to the cost of field thrashing, takes a most limited, not to say an imbecile, view of the matter. Let me not, however, be misunderstood. I make no admission for a moment that field thrashing, with all legitimate charges upon it, is at all less expensive than thrashing at the premises. I believe it to be the exact opposite of this. If I mistake not, Sir, an intelligent business man having grown his crops will look at the subject in all its bearings. There is first the corn to be got to the market in the best possible condition, and with the least risk of injury from adverse weather. There is next the chaff, which, if well gotten, may be used with a portion of the best and sweetest straw, cut up and mixed with other food, beneficially for the cattle. And, lastly, the great bulk of the straw is properly regarded as the raw material out of which the manure for the next year's crops of the farm is to be manufactured. Any more limited view of the matter must be an erroneous one. Who, then, with the least discernment, would unnecessarily expose to damage what may be profitably used for food, or leave the straw in a position the least favourable for converting into manure? To say nothing of the meagre and slovenly appearance of these wretched stacks, alias half-rotten straw heaps, where field thrashing is adopted, and how they tend to beggar the appearance of otherwise well cultivated farms, damaging the whole landscape, I contend from first to last there is neither economy nor convenience in such a practice. If the stack with all it contains must sooner or later be taken to the farm premises, I hold that you can move the sheaves at an infinitely less cost and trouble than after they are broken into endless fragments. I repeat therefore, that, looking at the thing in all its bearings, I am irresistibly brought to the conclusion that to thrash principally where the manure is to be made is far the most cleanly, convenient, and economical system. In prosecuting my task I have to give my views also of the best mode of stacking, and gentlemen may think I should have started there; but the place where, and the manner how, the corn is to be thrashed seemed in my mind to have precedence. I hardly need say it is impossible to lay down any exact rule where the corn should be stacked, or as to the dimensions of the stacks. These things must depend more or less on local circumstances. As a general principle the stacks should not be larger than the capacity of the barn will admit of, or that can be well grappled with in a winter's day. The system of dropping stacks one by one all over the farm where grown I think injudicious, as it requires a continual movement of all the stacking and thatching apparatus. Still more is the system of huddling all the stacks into a pent-up stack-yard at the premises to be condemned. In first raising the corn from the land reference should be paid to its destination, that it may be moved as far as practicable in that direction; and I think to stack in three or four groups of stacks, within a short distance of the premises where the litter is to be used, is the most judicious plan.

It must be admitted, however, to be a very nice art to set up stacks with due regard to safety, and, at the same time, comely neat erections (cheers). The practice varies immensely throughout the kingdom, and of the many, few, very few there are, who may be said to excel in this art. There are no prizes, by-the-by, given for good workmanship by our agricultural societies more deserving of support than those to the best stackers and thatchers, being farm labourers, and it is to be regretted that the difficulty of getting gentlemen who will take the trouble of going through a neighbourhood to adjudicate these prizes, is a great barrier to the extension of the practice, while nothing is more meritorious. In stacking, as in almost everything else, there is a great propensity to extremes; some will set up their stacks in the shape of a common horn lantern, no larger in the girth at the eaves than at the base. The consequence is, that in the event of a driving and long-continued rain, the drip of the eaves, instead of falling to the ground, settles into the butts of the sheaves, damaging often the whole stack. Others will make stacks so portly that you can judge nothing as to the quantity required, or when the stack will be made up, and at length you find yourself involved in about double the quantity of thatching there ought to have been. Here and there you find a man who understands his business as a science. Unhappily, however, such men are few and far between; but when met with, they are a treasure. I had the good fortune to possess one for about 18 years. Everything was done by system. In building his round stack, he kept his cord, as his rule, about two feet longer than he set out the foundation, with a knot within about a foot or 1 foot 6 inches of each end. When the stack was about breast high, its width would be the extreme length of his cord; after that he would build the walls, as nearly perpendicular as possible, relying with mechanical accuracy on the fact that as the weight of the stack increased, the spread below would cause it to go over just about enough to give the eaves a sufficient projection to well clear the stack. The stacking ladder was also marked at a given height, so that stack after stack might be seen varying scarcely an iota either in height or girth round the eaves, and before the roof was commenced the middle would be filled in the shape of a cone. Then, with the butts of the sheaves lying in a dripping direction, a short roof would suffice to keep out almost any ordinary quantity of rain even before the thatch was applied. In an oblong stack he would display the same scientific skill. You will not think I did wrong, sir, in obtaining several golden guineas from the neighbouring agricultural society at different times as a reward for this clever old workman (loud cheers). For stacking I think he nearly always bore away the prize; for the thatching he was not quite so successful, having a fearful competitor at the other end of the parish; but it is proper to say, I have seen no such thatching by agricultural labourers as in the neighbourhood of Luton, Beds, in any part of the United Kingdom. My own opinion is that we ought to have some agricultural diploma with which to reward such real masters of

art, for I believe most sincerely there are in both our learned universities many men bringing away the honourable distinction of M.A., who, as concerns all that is really useful to society, are dolts—mere numskulls, as compared with these excellent scientific workmen (laughter and cheers). From what has already been advanced, you will gather, Sir, that I think a small number of stacks just described should be brought together in contiguity in different groups at the time of harvest, as near the farm premises as is at all convenient, and then stack by stack taken to the machine-barn, as wanted for the purpose of thrashing; when all that is sweet and useful of the offal, for the purpose of feed, may be preserved, the coarser thrown into the yard, and the straw either stacked up or put into the straw-barn for constant use, as the case may be. Now, sir, I presume it does not admit of a question, in the present day, but what steam in 99 instances out of 100 is the most economical; but whether this power shall be portable or fixed must depend somewhat upon the local circumstances of the farm, and whether there is more than one farm homestead. My own predilections are in favour of a fixture, unless the party wishes, in addition to his farming business, to become an itinerant thrasher. In either case farm premises must be very incomplete without a thrashing loft, in which a shaft runs through it, to which may be attached a mill, chaff-cutter, or any other machine. Among so many excellent makers of steam thrashing machines, it would perhaps be invidious to give any very decided preference. I confess, however, I hold it to be far less important how you thrash your corn, so that you do it well, than the place where the operation is performed. I must contend, however, the opportune place is where the pigs and poultry are at hand to pick up the scatter, where the feeding stalls and stables are adjacent, where the litter is daily available, and most of all where you are safe from the obstruction of bad weather. Sir, in conclusion, permit me once more to assure you that, although I have had temerity enough to introduce this subject, I have done so chiefly with the desire of getting the sentiments of this Central Farmers' Club before the public, on the subject of field thrashing, which in many parts of the country is now so largely practised, and which for myself, taking into account all its accompaniments, I cannot regard but as a most expensive and slovenly system, almost approaching to a public nuisance, and as one of the foulest blots on modern agriculture (cheers).

Mr. R. BAKER (of Writtle) was desirous of corroborating the opinions expressed by his friend Mr. Bennett. It had been represented that corn could be thrashed by steam at 10d. or 1s. the quarter, and he must say that the statement had greatly surprised him. For his own part, he had generally taken advantage of the steam-thrashing of others, and certainly the occasions were rare that he had been able to thrash at a less expense than by the flail. But where steam thrashing was carried out in the slovenly manner described, he believed the loss to the farmer in the feeding-value of the straw and stubble was more than equivalent to the thrashing. He held, there-

fore, that all Lent corn, such as oats and barley, was far better thrashed by the flail. It was said that the use of the steam power for thrashing in the field greatly economised time; and undoubtedly it did so. There were few farms, however, on which, when the corn was once placed in the waggon, there was not a sufficient number of horses and drivers to take it to the home-stead. The waggon being loaded, the stackers would be in the homestead instead of the field, and the only difference in the cost was the difference in driving it to one point or another. He confessed unwillingly indeed, that he was one of those who were in such a backward stage of information with reference to agriculture as to think that some of the practices of their forefathers were quite as beneficial in the long run as many of the rapid processes of the present time—at all events so far as steam thrashing was concerned. The difference in the feeding value of the straw was taken at as much as one-third in Essex. The straw belonging to the landlord, and the foddering value to the tenant, whenever corn was thrashed by steam one-third was deducted; and if that one-third were not regarded as an equivalent for the injury done to the incoming tenant by the thrashing machine, the practice would not be allowed. Irrespective, then, of any other consideration, but merely in consideration of the value alone, he held that that practice sufficiently demonstrated that the feeding value of the straw was depreciated at least 33 per cent. Some persons were so sanguine with regard especially to steam power for thrashing, as to imagine that it was to supersede everything else, and that instead of costing anything like the sum now expended, it would not approach it by one-half. So, also, it was said respecting the steam plough. But there was one element that had been altogether lost sight of by those who entertained this opinion. He granted, for instance, that it would be a very great advantage in the autumnal months; but that it could be substituted for ordinary ploughing at a cheaper rate he very much doubted. And even if it could, the fact should not be kept out of view that the only manure produced on some farms was that which was produced by the horses, which were thus a useful auxiliary in converting a great portion of the produce into manure, and returning it to the land in that form. Introduce steam power they would lose this advantage, and deterioration would at once ensue. Granting, therefore, that steam power for the purposes of thrashing would to a certain extent diminish the cost of thrashing, still he held that in proportion as they diminished the cost of thrashing they would lose more in the feeding value of the straw and chaff consumed.

Mr. WOOD (of Ockley, Sussex) had seldom found himself differing so much as he did on that occasion from his friends Mr. Bennett and Mr. Baker. He thought it would have been better if the former gentleman, besides expressing his disgust at the manner in which thrashing in the field was managed in his own district and at the waste which occurred, had entered into some comparison of the cost of thrashing by means of a portable steam-engine, and the cost of providing that spacious building which was indispensable where there

was a fixed steam-engine. It should not be forgotten that a fixed engine must stand still during a great part of the year. It was only on very large farms that such an engine would answer; unless, indeed, the farmer turned miller or cake-maker, which he believed had in some instances been the case. If they examined the cost of thrashing wheat with portable engines—wheat being that species of corn that required most labour, and which was most frequently thrashed by steam—they would find that the thing could not be done so cheaply as had been represented in various publications; but, on the other hand, if they calculated the expense of erecting the buildings necessary for thrashing with a fixed engine, they would be led to the conclusion that it was the cheapest to place the stacks in the field where the corn was grown, provided the situation were convenient for subsequent removal (Hear, hear). The cost of a building, suitable for a fixed engine, would not be less, taking a moderate estimate, than £1,000. The cost of thrashing with a portable engine was, on the average, about 2s. 6d. per quarter, that being, in fact, a low estimate. It required four men to tie up the straw. He did not like to see the heaps of half-rotted straw lying about; and it did not take more men to tie the straw with one band and stack it than to stack it loosely. The only expense which this involved was that of providing bands, which could be made well for 6d. per 100, and at periods, moreover, when the men could do nothing else. As to the cavings and chaff which were alleged to be wasted, he could only say that it did not enter into his system to consume much of that kind of food, because, with the exception of letting the pigs run about the yard, he could not see much advantage in it. He was a fatter of stock, not a starver of it (laughter), and he was not in a position to rear and keep store stock for others to fatten. If wheat could be thrashed with a portable engine for 2s. 6d. a quarter, he thought it would be better in almost all cases to adopt that method than to incur the cost of erecting buildings.

Mr. BAKER: Suppose the buildings are erected?

Mr. WOOD said that would of course alter the case, the buildings would then be used; but in many cases there were no buildings suitable for such a purpose. Mr. Bennett had spoken of the difficulties that attended the removal of the thrashing apparatus. Now those difficulties were very small, the apparatus, consisting of a ladder and prongs and rakes only, and might be carried on the backs of boys with the greatest ease. On the other hand, anyone who calculated the cost of carrying the stacks to the barn, would find it to be very great indeed. His own farm, for example, comprised 700 to 800 acres; and during the last three years he had never carried a single sheaf or pitch of corn into the barn. His beans and peas he had carried, because he did not find it so profitable to thrash them by steam as by flail. As to comparing the expense of thrashing wheat, or even oats or barley, by steam, with the expense of thrashing it with the flail, it was a comparison which he could not at all understand. It must be borne in mind that formerly, when they all thrashed

wheat with the flail, they used to reap it knee-high; whereas now, by mowing or bagging it, they took it close to the ground. If a man were to thrash clean in that way by hand, the expense would not be less than 6s. or 8s. per quarter; and when they could thrash by steam at 2s. 6d. or even 3s. per quarter, to say that thrashing was done as cheap by hand as by steam, was to say what was contrary to the fact.

Mr. BENNETT observed that no one had said so.

Mr. WOOD said he understood Mr. Baker to say that.

Mr. BAKER said his remarks applied to oats or barley.

Mr. WOOD admitted that that altered the case. To his own mind it was manifest that there was very great economy in the use of steam—that was to say, in thrashing corn out in the field and avoiding the expense of carrying it to the barn. He himself never allowed any of the straw heaps of which Mr. Bennett had spoken to accumulate on the farm. If people pitched the straw on one side and then left it there, they of course did what was most objectionable; but because that was done by some slovenly farmers in Mr. Bennett's district, it did not follow that steam-thrashing in the field was in all cases to be condemned. (Hear, hear). Those who acted in such a manner were very unwise, but that must not lead others to form hasty conclusions. As the cavings accumulated, he himself sent large carts or waggons—they all knew that the Sussex waggons were very clumsy (laughter)—to carry them to the pig-yard, and he took care that that was done in a proper manner. Under the system which he pursued there was less expense than was incurred with a fixed engine, even where, as was sometimes the case, noble landowners had provided the most suitable premises; and he certainly would not recommend the agricultural body generally to throw aside portable steam engines and erect premises for fixed engines, as had been done at some great establishments.

Mr. THOMAS (of Bletsoe), having listened very attentively to the discussion, which had resolved itself into the most convenient mode of thrashing, &c., and to a certain extent was necessary to explain the subject, might be allowed to offer a few remarks. With regard to stacking the corn in the fields, there could be no doubt that the practice was a very convenient one, provided the stacks were set up by the side of a road, so as to facilitate the convenience of bringing them to the homestead to be thrashed: but to stack and thrash wheat in the fields where it grew was a practice he condemned, and he would appeal to practical gentlemen present as to whether it was not much easier to take the corn in the sheaf to the barn to be thrashed, than to carry the loose straw to the yards afterwards, where it must go to be converted into manure? There was not a question in his mind, independently of the loss that must arise from such a practice. Mr. Wood had said a great deal in praise of portable thrashing machines, and had condemned the fixed ones. It was well known that without convenient buildings the latter could not be turned to profitable account; but where the homestead was situated in a central position, it was a question in his mind whether the fixed steam-engine were not the most



profitable of the two. Mr. Wood also appeared to consider the chaff and cavings of no value; but he (Mr. T.) was of a different opinion; he considered them of great value, believing that the chaff and cavings, when properly steamed and mixed with other things for store stock, nearly paid for the cost of thrashing. He must also remark, in allusion to an observation of Mr. Wood, that he himself employed a fixed steam engine for other purposes as well as thrashing, though he was neither a miller nor a cake-maker, viz., cutting hay and straw into chaff, steaming the same, grinding corn and cake, and grating or mincing turnips, and various other purposes connected with the feeding of stock. Taking all these things into account, it was a question in his own mind whether, on a large farm, where the land lay pretty well together, a fixed engine were not the preferable one of the two. His plan was to get the greater portion of his corn into his stack-yard, situated close to the thrashing-barn and yards; but what he stacked in the field was placed near a road for the convenience of getting it home, as it was not his practice to have it thrashed in the fields.

Mr. WILLIAMS (of Baydon, Hungerford), like his friend Mr. Wood, differed considerably from Mr. Bennett and Mr. Baker on this question. Mr. Baker appeared to consider that, as a general rule, there were good farm premises conveniently situated for the tenant to work with. He thought that was anything but the rule; generally speaking, there was not one homestall in a hundred throughout the kingdom, that was deserving of the name. (Hear, hear). It was only in a few instances, and that where new buildings had been erected, that the homestall was as it ought to be, at all events in the parishes with which he was most familiar. He might take an illustration which would come home to the minds of many gentlemen present, the parish of East Hsley in Berkshire—the scene of the noted sheep fair—and that, he thought, was a fair specimen of the agricultural parishes generally throughout the country. There were seven or eight farms in the parish, the homestalls of each being situate in the village; and his friend Mr. Owen knew that they all ran to a distant point which was  $2\frac{1}{2}$  miles from the homestall. He had a brother occupying a farm in the parish, and he was satisfied that if that evil were remedied, and a homestall provided in a convenient situation, it would be a saving to him of £100 a-year. His brother was in the habit of bringing home nearly the whole of his corn to be thrashed by a fixed engine. There was the barn, and there was the manufacturing process of manure, &c., going on at an immense distance from a large portion of the farm, and a double expense was incurred owing to the inconvenient situation of the buildings, for remember the corn has not only to be drawn home, but the manure to be taken back again. Now, having a portable engine, they could stack the corn in the most convenient place, and thrash it out there. Every practical man knew that the place where the largest quantity of loads of corn could be stacked in a given time was the field where the corn grew. (Hear, hear). It did not require binding there, as it must do if sent elsewhere; and if it were sent home,

the men would not finish so much by one or two loads an hour. He had known many instances too in which the loads had fallen down on the road; and the consequence was, that the carter had to load it again, involving of course a considerable loss of time. Again, in all probability a piece of sweetdes or turnips were growing adjoining to where the corn grew. Many of the gentlemen present might have noticed at the Chelmsford show last year a portable bullock shed (at all events he remembered calling Mr. Baker's attention to it). It was made very substantial, and could be taken down and drawn to any part of the farm on three waggons, and placed up again for use in less than a day. Now, as regards "the convenience and economy of stacking and thrashing corn," the subject on the card, he thought there could be no question where the corn grew at a long distance from home, to stack it on the piece or near by a field of roots, thrash it out by means of the portable steam engine, give the fodder to cattle or sheep, thus making and leaving the manure where it is wanted, which could be done with such portable buildings he had alluded to. One of the most valuable men on a farm was the man who knew how to stack properly. Stackers were too apt to keep the rick level at the top. He maintained that a rick ought always to be convex at the surface, and that if it were, a week's continuous rain would not descend into it. Some years ago he saw a barley rick constructed on this principle, which had been standing for more than twenty-one years, and on putting his hand in, he found it as dry as when the rick was first made: the wet had not been able to penetrate it; it was so admirably put together, that the rick rotted inch by inch rather than let the wet into its center. That was a practical illustration of the form in which a rick ought to be made. On the subject of economy in the use of steam, he agreed with his friend Mr. Wood, and dissented from the views of Mr. Bennett and Mr. Baker. They had, he maintained, no right to condemn the system of using portable steam engines on account of its abuse. There was one consideration which appeared to him very important in connection with that subject. As regarded land which lay at a great distance from the homestall, it was very questionable whether, when the straw had once been got home, it ever went back again. On that ground he contended that when it was on the spot it ought to be kept there, and that the portable engine should be taken there to thrash it. As Mr. Baker had alluded to the steam plough, perhaps he (Mr. Williams) might venture to make a remark upon it. (Cries of "Question"). Well, he would simply observe, that a week ago previously to, the setting in of wet weather, his six-horse engine was drawing a large cultivator 6 feet 2 inches in width, and 6 to 7 inches deep, completely stirring some strong clay fallows in the most satisfactory manner.

Mr. BRADSHAW (of Knowle, Guildford) thought this subject had been very properly divided into two heads—the stacking of corn, and the thrashing of it; and under the last head was included, he imagined, the proper use of the straw when thrashed. If straw contained feeding properties, these ought of course to be care-

fully preserved; but, although Mr. Baker stated that straw, in passing through a thrashing machine, lost one-third of its value, he did not see why, if it were properly taken care of after passing through the drum of the machine, it should lose more than it would do in passing under the flail (Hear, hear). Perhaps he could not do better than refer to his own practice on the subject; for in such matters practice was far more valuable than theory. As respected the use of straw generally, he regarded all the operations connected with it as mere mercantile operations, the first point being to perform the labour at the least expense, and the next to make the best use of the produce. It was very important to take care and keep the straw in the most convenient place. His buildings were in the centre of a given quantity of land: he had a fixed steam-engine, and he brought the larger portion of the straw home to the buildings, and exercised his judgment in the best manner he could as to the placing of the stacks. He would bring every stack home if he could. Those which he could not bring home he always put in what appeared to him to be the most convenient places, being guided partly by the weather and partly by his available horse-power at the moment. His grand object was to stack the crop with as much promptitude as possible. It was an important point to get the straw near the machine, and, after it had been passed through the drum, to convey it as economically as possible to the place where it was to be used. His straw was landed where it had to be cut with the chaff-machine. On being cut, it fell down into bins, and from these a man could throw it where it was mixed up with the grated food; and there it remained till it was taken in skips and conveyed to the bullocks. What could be more economical than that? We had heard that evening of a dozen or thirteen farm-buildings. He would like to know what distance any part of the farm referred to was from the centre.

Mr. WOOD: Five miles.

Mr. BRADSHAW continued: Well, 640 acres made a square mile, and in ordinary cases the distance from the centre would be only half a mile. His own cavings and chaff fell into a house, and they went into a receptacle three yards distant, to be mixed up with grated swedes or mangold wurzel. During the past winter his store stock had been fed upon cavings and grated food. As to the expense of thrashing under opposite systems, various and conflicting statements had been put forward. They all knew that whether thrashing were done by flail or by machine the cost must depend on various circumstances; they could not come to any exact conclusion on the subject, though there could be no doubt as to the economy of thrashing with the steam-engine. Then, again, as regarded the thrashing-machine, if they had their steam-power centralized, it was a matter of calculation how they should use that power. He never thrashed after 12 o'clock, his hours being from 7 till 12, and as his men went to their regular work after that hour, he then ground meal, crushed oats, pulped swedes, and cut chaff. He did not want to have a large quantity of oat or barley straw thrashed,

with a view to the market, and his plan was to have the thrashing done just as it was required for the feeding of stock. He carried on the thing as a system of manufacture, and if they were to carry on such things to advantage, that was, he conceived, the principle they must all act upon (Hear, hear). A fortnight ago he visited the farm of a friend of his, and saw what Mr. Bennett had described. A man who had got a reputation as a farmer thrashed out and sold every quarter of wheat that he had (a voice—"And very wise too"). Yes, he might be right this year, but he would be wrong every nine years in ten.

Mr. BAKER said he supposed that before thrashing his corn Mr. Bradshaw put it into the barn.

Mr. BRADSHAW said that depended on circumstances.

Mr. BAKER observed that if that were not the case the stack must lie open from day to day.

Mr. BRADSHAW said he was guided by circumstances; the regulation of this matter was in fact part of his farming practice.

In reply to Mr. Wood,

Mr. BRADSHAW said his engine was a fixed one.

Mr. WOOD: Then you must take it to the barn.

Mr. BRADSHAW: No. Sometimes when the weather was fine, and he had plenty of hands, he went on thrashing from the waggons until noon; and in the afternoon carted the remainder of the rick into a bay that he had for unthrashed corn.

Col. ROLAND (of Woolwich) said, the gentleman who talked so much about stacking did not appear to have taken into account rats and mice. Unless the corn were stacked in the neighbourhood of the barn, and stone or iron pillars were used, there must be great loss from that source.

Mr. TRETHERY (of Silsoe, Beds) said, whatever difference of opinion there might be amongst them, they must all agree that Mr. Bennett had succeeded in infusing a considerable degree of novelty into the discussion, which was hardly to have been expected on such a subject (Hear, hear). The question had very naturally resolved itself into that of the comparative advantages of fixed engines and portable ones. That was the turn which the discussion had very properly taken. He could not have conceived that in these days the advantages of steam would for a moment be called in question by any one; and he was, therefore, surprised to hear Mr. Baker say that he could not understand how any system of steam-thrashing could be as economical as the flail.

Mr. BAKER: I said for barley and oats—Lent corn.

Mr. TRETHERY was glad of that correction. He thought that in dealing with this subject they did wrong in looking only at individual cases (Hear hear). The case just instanced by Mr. Williams had really very little to do with the matter. They all knew very well that when a farm was two-and-a-half miles long, and the homestead was at one end of it, the state of things was most inconvenient.

Mr. WILLIAMS begged pardon; he mentioned it as the rule.

Mr. TRETHERY was happy to say, then, that he at

all events lived in a neighbourhood where it was the exception (Hear, hear), and was sorry to hear that there was a district of the country where it was the rule. Whatever advantages a farm might otherwise possess, it was impossible that the best could be made of it under such circumstances. With regard to the stacking, he should dismiss that subject in one or two words, because he conceived that there could not be two opinions upon it. The system described by Mr. Bennett was that generally practised, and was found to be good. So far as they could get their men to carry it out, there was no question as to its utility. As regarded the straw, he might be prejudiced, but he could not conceive that it was so good for cattle after it had been thrashed in the fields, even though the greatest care were taken, as when it was given them fresh day by day. But you might buy gold itself too dear, and the question arose whether for this advantage it was worth while to incur the necessity of thrashing with the flail. Of the two, he had no hesitation in saying that it was better to sacrifice that advantage than to give up the use of the steam-engine.

Colonel ROLAND said, gentlemen who would take the trouble to visit the North of England or Scotland might frequently see the corn-stacks brought up by railway to the farm-yard, and tilted out to the thrashing machine at once.

Mr. SPEARING (of Chilbolton, Stockbridge) observed, that where the farm was four or four-and-a-half miles in length, the buildings not being situated in the centre, it was impossible advantageously to use a fixed steam-engine. He had himself just left a farm of from twelve to thirteen hundred acres, one end of which was four miles from the other; and there, for example, it was impossible to use a fixed engine. At the same time steam power was used on that farm advantageously, and with its assistance the proportion of corn grown on 350 acres at the upper end of the farm had been thrashed, the straw might afterwards converted by sheep into manure. Under this method of proceeding, there was a great saving of expense. It was, of course, very desirable that the ricks should always be made in the most convenient situation. On that point, he concurred in what fell from Mr. Williams. As to size, he thought it should be what an ordinary steam-engine of five or six-horse power could thrash in a single winter's day. He agreed with Mr. Baker that there was very little difference between the expense of thrashing Lent corn by steam and thrashing it by hand; but with respect to wheat, he was decidedly of opinion that thrashing by steam was by far the most economical. In the neighbourhood in which he resided, it was the common practice to mow the wheat instead of reaping it.

Mr. HARRISON (of Clifton Hampden, Berks) said there was one advantage of thrashing by steam, as compared with thrashing by flail, which all the previous speakers had overlooked. They all knew that there were scarcely any greater bugbears to farmers than carpenters' and blacksmiths' bills; and one advantage which attended thrashing by steam was the avoidance of those sources of expense.

Mr. RAMSAY (of Newcastle-on-Tyne) thought that, if he were rightly estimated, he might be considered a rather fast man in relation to improvements, Farmers' Clubs, and other subjects (laughter). He was sorry to be under the necessity of setting up his judgment against that of gentlemen like Mr. Bennett and Mr. Baker, who had both studied agricultural questions so closely and practically, but he could not help thinking that on this question they had rather a jaundiced eye. One thing at least was evident, namely, that Mr. Bennett had met with some slovenly men near Cambridge (laughter); and he hoped that one effect of that discussion would be to bring such persons into better order (renewed laughter). As to the comparative merits of fixed engines and portable ones, persons in the North were perhaps not very good judges, as few of the latter were used. Owing to the unfortunate character of their climate, they were very glad to avail themselves of every means of securing their corn by either getting it into barns, stack-yards, or by stacking it—in short, to do anything whatever to have it dry. The bad weather of the last season had proved very trying; so much so, indeed, that there is a great deal of corn in the North now selling at from 36s. to 40s., in consequence of the injury which it had sustained from the weather. In their mode of stacking corn, their general practice somewhat resembled that of Mr. Williams. The men who make the stacks—and there are no want of such men, no more than of ploughmen—take a cord and fasten it by a stick in the middle of the stack bottom, and then carry it round a circle of whatever diameter is fixed upon, which keeps the stacks all one size if necessary. The great art of making stacks is to keep them well filled in the middle, which gives the sheaves a drooping inclination, and that effectually shoots off the wet. He might observe that the Scotch farmers, although excellent tillers of the earth, and get large crops of everything, yet are rather careless about having neat stacks; they don't bestow much time or money in that way—too little I think. On the largest farms in the north fixed engines are general, but still portable ones are at times useful. Last year I bought a portable engine, which had scarcely been used, for £100, and had it attached to two thrashing machines I have, which were driven by four horses each. The farm-yards being about a mile from each other, it took four horses 100 days to thrash my crops; when I got my locomotive to work I got the work done in far less than half the time, and much better also. I found I had not half work for my engine, and I had it applied to cut wood for my collieries, and believe it has saved me £200 the first year (Hear, hear) by being so employed, and it can still do more work if needful. As to thrashing by the flail, there are few men in my country who will or can thrash, and it is time I think when such antiquated notions should be abandoned; they are quite behind the age we live in. If Mr. Bennett thinks good stackers of corn are so scarce, I would recommend him to found a scholarship at Cambridge, and then he would have no want of candidates (laughter).

Mr. SIDNEY (of Peckham) observed that the subject of the use of steam power was first introduced to the Club by

Mr. Thomas of Lidlington, in 1849; and he regretted that that gentleman was not present, to mark how the lapse of time had converted Mr. Bennett to the views which he (Mr. Thomas) propounded at that period. There was one important point connected with the comparative advantages of fixed engines and portable ones which had been lost sight of that evening—viz., the expense did not end with the buying of the engine; a fixed engine was more powerful, at least twice as durable, and consumed very much less fuel than a portable engine. He might add, as the result of his own observation, that in Scotland, Bedfordshire, Norfolk—wherever, in fact, there was a lease or anything like fixity of tenure, fixed engines prevailed. As the Club laboured to enlighten, not tenants only, but landlords, he thought they should not lay so much stress on exceptional make-shifts in the arrangements of farm buildings, which were often unavoidable in a new system of operations, but should rather lay down the principles adapted for the general guidance of the agricultural community. It would be a waste of time to argue whether or not the use of steam power were desirable. That question was settled by the fact that there were now more than a dozen large manufacturers, who were sending out hundreds of engines per annum. He could not imagine that Mr. Baker was serious in praising the flail, but was rather disposed to think that he wished to say something that would please those friends of his who had not yet got rid of their prejudices against steam machinery.

The CHAIRMAN said he wished to make one or two remarks previous to Mr. Bennett's reply. He thought that if Mr. Bennett had started earlier in the matter under discussion he would have come to a different conclusion. It would have been well, perhaps, had he combined with the operations of stacking and thrashing that of harvesting corn; the three being too intimately connected to be separated. The advantage of stacking and thrashing corn where it grew was, he thought, obvious. Having a fixed thrashing machine, his practice was to carry the loose corn to the stack-yard, but the sheaf corn he kept in the field where it grew, and carted it home as required. Had he not a fixed thrashing machine, he should be inclined to adopt the plan so strongly condemned by Mr. Bennett, that of stacking the corn where it grew, thrashing it in the field, and carting home the straw as he wanted it. There was no reason why that system should not be carried out without being accompanied by the slovenliness of which Mr. Bennett had spoken. As to the cavings and the chaff, they ought, in his opinion, to be carted home at once, and placed in some covered barn or shed, to be used as required. It was not necessary to condemn a principle because some abused it. In stacking he thought the round was preferable to the old-fashioned oblong stack, inasmuch as it required much less roofing. With respect to the thrashing of Lent-corn, as advocated by Mr. Baker, by the flail, there was one feature which had not been taken into account, and that was the very large quantity of corn which was commonly left in the straw when the flail was relied upon. He believed that as much extra corn was secured

by means of a well-constructed thrashing machine, beyond what would be obtained if the thrashing were done by hand, as would defray the cost of thrashing. Some persons condemned stacked straw, and thought that cattle did not do well upon it. His opinion was the reverse of that. He had seen beasts foddered with straw which had been some time under stack, and at the same time with straw fresh from the flail, and they had eaten the former in preference to the latter. That he had observed repeatedly. One gentleman had made a remark as to the necessity of carting corn into a stack-yard with the view of avoiding the ravages of vermin. Now, if any gentleman were to offer him straddles to put his corn upon on the condition that he would use them, he would not accept them. Such things occupied space, and were of no earthly advantage. As to vermin, men went round his neighbourhood after harvest dressed the corn at a shilling a stack, and they scarcely knew what injury from vermin was. He could answer for himself, that he always avoided damage from vermin by means of that precaution (Hear, hear).

Mr. WILLIAMS wished to observe, with regard to straddles, that they completely prevented cats from catching mice in the ricks.

Mr. BAKER: Mice never get into the ricks.

Mr. BENNETT then replied: Notwithstanding, he said, all that he had heard, he was not a whit better satisfied than he was before that thrashing in the field was preferable to thrashing at home. Having had a good deal of experience of the former, he hoped he should never resort to it again, except under very peculiar circumstances. There was often more labour in removing what he might term the offal, to say nothing of the straw, than there would be in removing the whole stack. He had not advocated the conveyance of the whole of the straw to the farm premises; what he contended was, that it should be contiguous to them. What he preferred was the having a group of stacks in three or four different localities, all tending, as it were, towards the homestead. He still maintained that, in nine cases out of ten, field thrashing was a slovenly operation, and that its accompaniments often made it a perfect nuisance.

On the motion of Mr. Owen, seconded by Mr. Spearling, the following resolution was adopted—

“Resolved: That it is desirable, both as respects convenience and economy, to place the corn-stacks of the farm at the time of harvest in groups in different directions, as contiguous to the farm homestead as may be, removing them to the thrashing-barn as wanted.

“That field thrashing, as recently practised, is not to be recommended, except under peculiar circumstances.”

On the motion of Mr. Owen, thanks were voted to Mr. Bennett for the manner in which he had introduced the subject; and on the motion of Mr. Trethewey, a similar compliment was also paid the Chairman.

#### UNIFORM SYSTEM OF WEIGHTS AND MEASURES.

The CHAIRMAN said it would be remembered that,

at the conclusion of the last meeting, he brought briefly under the notice of the Club the very imperfect system on which corn was sold at the present time in the different counties of England, and the evils which arose from this great variety of weights and measures. The whole thing was, as he then remarked, in a state of confusion; and the greatest inconvenience was occasioned both to corn-dealers and to farmers. He had no doubt that many of them had seen a petition on the subject, from Wolverhampton, setting forth the great difficulties which existed in weights and measures, with regard to wheat; and he believed there were the same variations with respect to barley and other kinds of produce. Now he was very anxious to obtain the assistance and co-operation of the Club in endeavouring to remedy this evil. He was aware that the matter was not unattended with difficulties; but he thought the difficulties might be overcome. If they could not agree upon a given weight as a standard, they might then fall back upon the imperial bushel; and if they could only succeed in getting that measure universally established and acted upon, it would surely be a great improvement on the existing state of things. In his own neighbourhood there was a strong feeling gaining ground, that it was much more desirable to sell by weight than by measure, because it was far easier to make correct weight than to make correct measure (Hear, hear). Even under the old system of thrashing and dressing, there was often a considerable difference in the weight of different sacks of corn put up by the same man, however great might be his desire to avoid such a discrepancy. This difficulty had, as they all knew, been increased by the use of the steam-engine; and even Mr. Baker would not contend that they should go back to the flail as regarded wheat. This change enhanced, he thought, the desirability of substituting weight for measure. In his own market it was, in nine cases out of ten, posted up on the cornstands that wheat would be bought only by weight. A corn merchant told him the other day that he had found as much as 7lb. difference in the weight of a sack of corn thrashed the same day and under the same circumstances; and he said that unless the weight was attached to corn he did not know how to carry on his business properly. Wishing to ascertain the feeling of the merchants and farmers of his own neighbourhood on the subject, he ventured to convene a meeting of them at their Corn Exchange on the previous Saturday week, and the meeting was unanimously of opinion that it was more desirable to sell by weight than by measure. As to the precise weight to be adopted, 60lbs. per bushel being taken for the purposes of the Tithe Commutation Act, they thought that weight the most desirable; and he thought those whom he now addressed would agree with him that 60lbs. was a fair representation of a bushel of wheat, taking England throughout. His object in now introducing the subject was to elicit the opinion of the Club as to the course which it was most desirable to pursue in reference to this important matter.

Mr. SKELTON (of Sutton Bridge) thought the real question was whether it was proper and right that corn

should always be sold at its natural value; and, if so, what was the best mode of ascertaining that value? He would not recommend the adoption of 60lbs., or 61lbs., or 62lbs., or any other precise weight, on account of the variation in the seasons. Moreover, farmers must take care not to run counter to the tithe rent-charge, for in that case the clergy as a body would rise in opposition to them. He thought the common-sense principle to adopt generally was that which had been acted upon in his neighbourhood (Wisbeach) for the last twenty years, and which was spreading rapidly in Norfolk, namely, for the farmer, after thrashing and well dressing his wheat, &c., to measure up four imperial bushels into a sack, carefully ascertain the weight of it, then sell it to the merchant, &c., per quarter weighing 16 st. 7 lb., 17 st., 17 st. 7 lb., or what ever weight four imperial bushels had proved on trial to have weighed. Thus the natural weight of four imperial bushels was made to represent the measure, and no dispute need arise about the measure on delivery of his corn to the buyer; and under the operation of that system the farmer had not to deliver more than measure, and the tithe owner and landlord, who received his rent upon corn averages, would be fairly dealt with. As regarded the tithe rent-charge, he did not think the question of having 60lbs. per bushel was introduced by the act; what was specified was the imperial measure. His primary object in rising was to enforce the necessity of corn being sold by its natural value, as represented by its weight per imperial quarter.

Mr. R. BAKER said, his experience was more in favour of measure than weight. They might depend upon it, that as long as the present tithe law stood the legislature would never sanction any deviation from the imperial bushel. All the tithe calculations were based upon it.

Mr. RAMSAY said it should be remembered that the heaviest wheat was not always the most valuable. He thought it well worthy of consideration, whether on the whole measure were not preferable to weight.

Mr. TRETHEWY was strongly of opinion that they must discard weight altogether, and go for measure. The tithe charge, paid to the clergy, was calculated on the bushel; the corn averages of the whole kingdom were taken on the same basis; and the same remark applied to corn rents. Sale by weight would give an unnatural value to many descriptions of wheat.

Mr. BRADSHAW observed, that if the imperial bushel were uniformly enforced throughout the kingdom, farmers would soon discover that it was their interest to weigh their wheat before taking it to market. That would be an equitable arrangement for all parties.

Mr. WOOD would prefer uniform weight. Measure was generally adopted in Sussex, but it gave rise to constant disputes.

Mr. OWEN (of Clapton) was in favour of measure, conceiving that uniform weight would be inconsistent with the variations in the seasons.

Mr. WILLIAMS said there could not be the slightest doubt that the imperial bushel was the law of the land,

and he thought the club should declare it to be their opinion that the adoption of that measure ought to be enforced compulsorily (hear, hear).

After some conversation, and a few additional remarks

from the Chairman, the discussion was adjourned till the first Monday in May, when it will again come on, after the subject on the card for that evening has been disposed of.

## CULTIVATION BY STEAM-POWER, AS NOW IN PRACTICE AT WOOLSTON.

Mr. Smith has very judiciously resolved to further test and publicly illustrate his invention—steam-plough it can hardly be called—on his own farm. In accordance with this determination, he issued a number of invitations for the week before last. It is satisfactory to say these were generally responded to; a company of between three and four hundred practical and scientific men from all parts of England having, on either of the two days selected, witnessed these very interesting experiments. We are enabled to give the names of a few, from which the character of the assemblage may be estimated. It will be found they were nearly all well able to offer a sound and reliable judgment on the proceedings brought before them. They included, amongst others, Lord St. John, Major Lucas, the Hon. Andrew St. John, J. Clode, Esq., W. G. Duncan, Esq., W. Levi, Esq., H. S. Trower, Esq., W. Powell, Esq., Ed. Athawes, Esq., H. Moore, Esq., the Revs. E. Hill, H. W. Smith, G. W. Pierce, and J. Benthall, Messrs. E. Greaves, Elkins, G. Payne, W. Payne, Fairey, G. Scriven, T. Whitworth, W. Whitworth, Scrivener, Wilson, from Buckinghamshire; R. L. Orlebar, Esq., and Messrs. Twitchell, C. Howard, and J. Pain, from Bedfordshire; Wm. Smyth, Esq., Albert Pell, Esq., Captain Sage, E. H. C. Monckton, Esq., and Mr. V. Barford, from Northamptonshire; J. N. Harrison, Esq., and Mr. Gillett, Berkshire; Professor Nesbit, H. H. Fulton, Esq., T. B. Ety, Esq., and F. Hamilton, Esq., Middlesex; Robert Jacobs, Esq., and party from the Isle of Wight; Messrs. Stainton and J. Coe, Norfolk; E. Griffen, Lonsley, and Gay, Oxfordshire; Creese, Gloucestershire; C. G. Clark, and Humphreys, Worcestershire; Rev. J. Linton, Mr. H. Toovey, Cambridgehire; Mr. E. Fisher, Nottinghamshire; E. Campion, Esq., J. Campion, Esq., Messrs. Roby, Bloxson, and J. W. Fane, Leicestershire; Mr. R. W. Wright, C. Byrd, Esq., and Mr. Stanley, Staffordshire; Mr. W. Massey, Shropshire; Messrs. Swinnerton, J. E. Tyser, Hawkes, Walker, W. H. Clare, Warwickshire; Sirett, Suffolk; T. B. Dring Esq., and Mr. Davy, Lincolnshire; W. Ackroyd, Ed. Crane, T. Coulson, Esqs., Yorkshire; Messrs. W. H. Bliss, and S. Denton, Huntingdonshire—altogether, at least three hundred and fifty, from twenty counties in England.

As many of our readers have not yet had the opportunity these gentlemen enjoyed, we may say, in a few words, that the peculiarities of the plan are these:—

The roots and seeds of noxious weeds are kept near the surface, and easily detected and destroyed.

The soil is shattered and disintegrated at once, instead of being rolled over in a lump.

The subsoil is *gradually* raised and mixed with the soil. The value of this arises from the fact that almost all subsoils possess some considerable renovating and fertilizing powers; but, being at the same time deficient in some qualities which are necessary to vegetation, they are frequently injurious when brought up to the surface in large quantities by deep ploughing; while subsoiling, valuable as it is, only gives us the advantage of a greater depth of *porous* soil. Mr. Smith, by his plan, essays to at once render the land porous deeper than ordinary subsoiling, and thereby admit the air deeper, and let in the rain-water more readily, and bring up to the surface small quantities of that which is only valuable in small quantities—viz., the mineral qualities of the subsoil.

These advantages are irrespective of steam.

With steam, there is no pawing of the horses' feet.

The undersoil is left irregular; and thus the water readily percolates to the drains. After a heavy rain, the water does not flow *over* the surface, but is instantly absorbed, as if by a sponge; therefore, there is no drift.

Any reasonable depth—say from 12 to 16 inches—is easily obtained.

Half the horses on a farm may be sold. Mr. Smith himself has sold three for £150, and thus saved £90 a-year (the cost of keeping them) for feeding other stock.

The bean-stubbles may, in their dry and hard state, immediately after harvest, and with great rapidity, be prepared for wheat-seeding; and all the white-crop stubbles may, before winter sets in, be trenched up, subsoiled, and laid dry for a winter clearing. Those at Woolston were all completed last year by the 6th of November, except a little piece reserved for Thursday's and Saturday's meetings.

It is important to observe that the engine-tackle and ropes are the same with which Mr. Smith commenced. There was some doubt expressed as to the length of time the rope would last. It is quite certain that much care is required for the proper use of it, to diminish as much as possible the amount of friction; but this rope has already worked over 180 acres, and is at present, apparently, not much the worse for wear.

It is but justice to say that the work was thought much more of than it was at Woburn, in the autumn last year, when, on the occasion of the meeting of the Bedfordshire Agricultural Society, Mr. Smith was engaged on the Park Farm. Any especial neatness—or, indeed, anything like good ploughing—is never aimed at. Mr. Smith depends on his own peculiar method of breaking up the soil, and the advantages he arrives at

by the system. As far as the proof can be gathered from his own farm, it must be allowed that his wheat-plant looked excellent—amongst some of the best seen this spring—and that the farm altogether was in a very creditable condition.

à la Mr. Mechi, as they accompanied him over the land; while in the hospitality of his arrangements, and the subsequent talk over agricultural topics, he took another leaf from the note-book of the worthy sheriff.

Mr. Smith treated his visitors to peripatetic lectures,

During the day, the following statement was circulated amongst the company:—

MR. SMITH'S SYSTEM OF FARMING BY STEAM.

MIXED GRAVEL AND CLAY LAND, THE WHOLE OF WHICH HAS BEEN UNDER MY SYSTEM FOR FOUR AND SOME FIVE AND SIX YEARS, USING THE PLOUGH ONLY FOR PLOUGHING CLOVER-LEY.

TABLE showing the Cost, Crops, Quantity of Seed, and Produce per Acre, under Steam, using Horses for Scuffling and Subsoiling, to which must be added 1s. 6d. per Acre, for interest, &c.

1856.	Steam-ploughed.	Cost.		Scuffled.	Cost.		Subsoiled.	Cost.		Total.	Crop.	Seed.		Produce.	
		s.	d.		s.	d.		s.	d.			s.	d.		b.
No. 1	1	5	2	3	6	0		11	2		Turnips			Eat by the fly, scuffled up	
5	1	5	2					5	2		Beans	3	0	6 3	
1857.															
No. 1				2	4	0			4	0	Wheat	0	3		
2	1	8	8				1	3	0	11	4	Roots			
3	Clover-ley ploughed with horses.												Wheat	0	3
4	1	8	8				1	3	0	11	4	Beans	3	0	
5	1	5	2	1	2	0				7	2	Wheat	1	1	

Nos. 1 and 5 had some filth in them when they were Steam-ploughed in 1856.

TABLE showing the cropping on heavy land since a fallow.

No.	1857.	1856.	1855.	1854.	1853.	1852.	1851.	1850.	1849.	1848.	1847.
No. 1	Clover	Oats	Beans	Wheat	Fallow						
2	Wheat	Beans	Wheat	Fallow							
3	Barley	Peas	Oats	Beans	Wheat	Clover	Wheat	Beans	Wheat	Fallow	
4	Beans	Wheat	Beans	Oats	Beans	Wheat	Clover	Wheat	Beans	Fallow	Fallow

TABLE showing the Cost of Cultivation, &c., by Steam, to which must be added 1s. 6d. per Acre, for interest, &c.

1856.	Steam-ploughed.	Cost.		Scuffled.	Cost.		Subsoiled.	Cost.		Total.	Crop.	Seed.		Produce.	
		s.	d.		s.	d.		s.	d.			s.	d.		b.
No. 1	1	5	2				2	6	0	11	2	Oats	3	0	9 2
3	2	10	4	1	2	0				12	4	Peas	3	0	5 1
1857.															
No. 1															
2	1	5	2	1	2	0				7	2	Wheat	1	1	
3	1	5	2	2	4	0				6	2	Barley	2	0	
4	1	8	8				2	6	0	14	8	Beans	3	0	

Nos. 3 and 4 became filthy under plough culture, in consequence of eating the clover-off without following them; my system was started upon No. 4 in 1853, and upon No. 3 in 1854; Steam was started upon No. 3 in 1856, and upon No. 4 in 1857. No. 3 is now clean, No. 4 will be in 1858, thereby proving that Steam beats horses upon my system.

The above table proves that cold land under the plough system must have a fallow of some kind every four years; that under my system and steam, if filthy, it will gradually become and remain clean under crop, and that the old plough is the farmer's best filth planter.

Woolston, March 25, 1857.

WILLIAM SMITH.

The following Estimate has since been forwarded to us:—

Estimated produce of an Acre of Clay Land for Six Years on the Old system: Fallow, 0 qr. £0; Wheat, 4 qrs., £10 0s.; Beans, 4 qrs., £6 8s.; Oats, 6 qrs., £7 10s.; Clover, 2½ tons, £7 10s.; Wheat, 4 qrs., £10. Total £41 8s. Now must come a fallow to clean it.

On the New System: Peas, 5 qrs., £8 0s.; Wheat, 5 qrs., £12 10s.; Beans, 5 qrs., £8 0s.; Oats, 9 qrs., £11 5s.; Clover, 3½ tons, £10 10s.; Wheat, 5 qrs., £12 10s. Total, £62 15s.; and the land as clean as a garden.

## THE SEWAGE QUESTION: THE RELATION OF TOWN AND COUNTRY.

There are certain public questions, the importance of which no one affects to deny, but which nevertheless present, in their tardy progress to realization, a marked contrast to that of other questions, not more, if indeed quite so, important in their aspects—civil, political, or commercial. Of this class of slowly-progressive questions, that of “town-sewage” is undoubtedly a marked example. For a long period, now beginning to be reckoned by decades, its importance has become widely recognized: chemists in the laboratory and agriculturists in the field have combined in proving that the “sin and sorrow” of the towns, rightly disposed of, would be to the country a boon and a blessing. Ardent-minded sanitary reformers and enthusiastic engineers have raised their voices in denouncing the woful waste—which if not quite intended is nearly quite uncared for—which year after year goes on, by allowing the refuse of our towns, rich in fertilizing matters, to pass away to pollute our rivers and to waste in the sea. Moralists, too, have not failed to stigmatize the heedlessness—to use the mildest term—which characterizes towns in removing a nuisance from themselves without consulting the effects of its transference upon others. Physicians have also raised their warning voices in reminding the inhabitants of the towns that it is not, or ought not to be, so much a pecuniary question, as one affecting their health; for what properly-disposed of in the country has a “life-giving” value, allowed to decompose in the towns has a “death-dealing danger.” Men, too, with whom the all-absorbing point in every question is, “Will it pay?” point to the folly of our agriculturists, who bring at great cost from distant lands valuable manure, which in another shape may almost be said to lie at their doors; and mourn over the fact that in London alone town-manure with fertilizing matters worth £600,000 a-year is annually thrown away. Yet, notwithstanding all this, the question of town-sewage, and what to do with it, remains very much in the same position it occupied some dozen years ago. Every now and then a little agitation is got up, which shows the existence of some vitality in the question; a paper is read at a farmers’ club or at a learned society; some go-a-head agriculturist is found loudly expressing his praises in favour of the “fertilizing matters of town-sewage,” to quote a favourite form of expression; but in a short time the excitement ceases, and the public drops into its natural condition of apathy and indifference.

Yet, taking a politico-economical view of the matter, it seems strange that the ordinary principle of “supply and demand” does not regulate this as it does other matters, where one party has something valuable to dispose of, and another is in want of this same, and has moreover the wherewithal to pay for it. Not unusual surely is it to see cases where capital—Argus-eyed and Briarean-handed—is eager to rush into speculations which afford even the veriest margin of profit. And, after

all that has been advanced in favour of the paying properties of “town-sewage,” and in view of the glowing pictures which have been drawn of the mine of wealth which only waits the adventurer, to pour a shower of gold into his lap as a reward for his toil in the matter, one truly is much disposed to be of opinion that there must have been some over-statement of the “value” and of the extent of this “mine,” since we see little or no anxiety in the pack of capitalists—not usually men of modest mien or quite dead to pecuniary sensations—to test the one, or avail themselves of the riches of the other. A thing *per se* may be valuable—highly so; but, nevertheless, it may be connected with other circumstances which render it impossible, in a paying sense, to avail oneself of its valuable properties. We may buy gold too dear. We may crush the quartz which contains it, and find that we have expended more in the operation than we obtain as a result. Something of this sort we think obtains with reference to the sewage question. That the refuse of our towns does contain fertilizing matters of value to our farmers no one denies; but while admitting this, it by no means follows that we admit of its paying those who undertake to convey it from town to country. There are a variety of points to be considered before this can be affirmed; what these are, we propose hereafter to glance at, in the meantime noting what appears very obvious, and yet not by any means admitted by those who sneer continually at the “agricultural interest,” that if agriculturists could have a really good manure presented to them at a price consistent with its worth, they would most gladly avail themselves of it, and would in no-wise trouble themselves as to whether it was foreign or domestic manure, the fact of its fertilizing value being to them the all-important point.

Not altogether generous or truthful is the statement that agriculturists are so prejudiced in the matter that they will not use town sewage, so long as they can procure foreign guano. They have no interest, as some would seem to think they have, in preferring one before the other; and it is by no means “English fair-play” to blame the agricultural community for not using their sewage, when it is clearly evident that in the first place it must be taken to them before they can use it. With the “agricultural interest” the question is simply a commercial one—a mere matter of pounds, shillings, and pence. With the “town interest,” on the contrary, the question must be viewed in two aspects: sanitary and commercial. We say, *must*, for they cannot be separated; and of the two, the sanitary point of view is of primary importance. On this point we venture to present a few remarks taken from an article\* which we contributed some short time ago to the “Journal

\* “Our modern Town Drainage System: is it right or wrong? The question considered with reference to its Connexion with Agriculture.”



of Agriculture" (Blackwood; No. 52): — "The paying point is not the only one to be considered; the social, the sanitary one, must not, cannot justly or safely be ignored. It is the duty of every people to get rid of that which is proved beyond a doubt to be the cause of great disease; nay, more, it is their wisest policy and truest interest. We know that the refuse-matters of our towns have a value in the country, and are dreaded while present in the town; we must therefore, as communities dwelling in towns, make up our minds to take them to the country at whatever cost, placing what we receive for it—no matter how much or how little—against the cost of transmission. Should there be, which with a proper system there might, a balance in favour of the town, so far so good; if against, let them not grumble, but on the contrary perform the duty, and be thankful that they get something for that which (viewing the matter rightly) is a nuisance, and which they should be glad to get rid of at any cost."

This view of the matter, we are glad to say, is fast being taken by many. At a recent meeting of the Society of Arts, in the discussion which followed the reading of Mr. Fothergill Cooke's paper "On the utilisation of town sewage by the deodorising process," Mr. Wilkinson, a member of the metropolitan board of sewage, "contended that they had nothing to do with the commercial consideration of the question. The question was, how they could most efficiently, in a sanitary point of view, effect the complete drainage of the metropolis. \* \* He dissented from the opinion just expressed, that because the products were not commercially valuable, the deodorising principle ought not on that account to be considered by the metropolitan board." It evidently must thus come to be considered by towns. They have a double interest in the matter, and these must be worked harmoniously before beneficial results can be obtained. With agriculturists it is simply a matter of business policy whether they shall or shall not use this town sewage matter, whenever they can get a regular supply of it presented to them; and this its value will at once decide. Right gladly will they avail themselves of it, if it is worth the money asked for it; if not, it will only remain for the town to lower its price—glad, as we said, to find that what near their dwellings is a source of disease, and a continual drain upon their health and purses, taken to the country becomes a source of revenue, no matter how small in amount.

It will be interesting, then, to glance at the prospects of the question viewed in this double light—sanitary and commercial. Taking it for granted that the sanitary importance of the question is undoubted, and that it is an absolute necessity on the part of the town to attend to it, it will be unnecessary to take up space by dwelling on the point; proceeding to consider what prospect there is of the "town sewage" being conveyed to the country, and supplied to the farmer at a price which will repay, in some measure, the cost of conveyance.

In glancing at the various points connected with this interesting question, it will economize space to divide our remarks into two classes: 1st, The fertilizing value of town sewage; 2nd, The methods by which it is

proposed to make it available for agricultural purposes.

The description of the composition of London sewage, as given by Mr. Fothergill Cooke in his recent lecture, will apply pretty closely to that of all large towns. "Sewage contains the debris of every description of animal and vegetable matter, mixed with some valuable mineral substances. The refuse from our abodes unquestionably forms the greater and more valuable portion. Every kitchen-sink also supplies a large quantity of animal refuse or waste. Each falling shower washes into the sewers impurities of the air, quantities of soot, finely triturated mineral matters, as well as potash from the decomposed granite of the streets. Manufacturers add many other substances to the foregoing, and tons of soap increase the richness of the stream. These miscellaneous matters, dissolved and broken-down in the waste water, unite to form the sewage of London, which, unless stained by some bright dye, generally offers a nearly uniform blackish-grey mixture. Very little solid matter except chips or shavings of wood, or feathers, ever make their appearance." But we take it for granted, that of all those miscellaneous matters which make up the bulk of town sewage, the most valuable, as containing the largest proportion of fertilizing matter, is the "excrements of our population." All authorities agree on this. To estimate, then, the value of the excreta of our town population, a variety of experiments and analyses have been instituted. Of the various writers who have treated on the subject, perhaps Mr. J. B. Lawes has gone most fully into its details. In his admirable paper, read before the Society of Arts, "On the Sewage of London," March 7th, 1855, a vast amount of information was given on the above point, from which the following was deduced. The total amount of real dry substance voided by each individual of the population of London during the twenty-four hours is 2 ounces, or 46 lbs. per annum. Of this, 10½ lbs. is mineral matter, of which 2-5ths are phosphates, or the phosphates will be equal in amount to nearly one-tenth of the whole dry substance. The carbon is equal to nearly 17 lbs. per annum, or 3-4ths of an ounce per day; of nitrogen there is nearly 1-3rd of an ounce per day, or about 8 lbs. per annum—"and these amounts of nitrogen are equal to .42 of an ounce per day, and nearly 10 lbs. per annum of ammonia. The amount of the constituents voided by the total population (of London) in one year, if entirely freed from water, is said to be 51,286½ tons. Of this about 1-5th is mineral matter, and the nitrogen it contains amounts to about 1-6th of the whole—namely, 8,859½ tons, which is equal to 10,758½ tons of ammonia. Now, little more than ½ a cwt. of ammonia is the usual artificial dressing for an acre of cereal grain, and it might be calculated to yield an increase of crop of 10 to 12 bushels of wheat, or these 10,758½ tons of ammonia would afford a produce of about 600,000 quarters, if it could be conveniently applied for such a purpose. The intrinsic value of the sewage of London considered in this merely chemical point of view is therefore enormous. Indeed, according to the above supposition, it would return to the metro-

polis nearly one-third of the wheat consumed by its population." As corroborative of the truth of Mr. Lawes' estimate, Professor Way stated that after investigating the matter by a process altogether different from that of Mr. Lawes, he found the solid matter voided by each of the population in 24 hours to be 2½ ounces against Mr. Lawes' 2 ounces, and the amount of nitrogen 36-100ths of an ounce against Mr. Lawes 3½-10ths. Mr. Fothergill Cooke estimates the amount of nitrogen consumed by the inhabitants of London "in maintaining their vitality" at 12,000 tons annually, equal to 15,000 tons of ammonia—10,000 tons of which are carried off by the sewers—the phosphates amounting to 6,000 tons. Comparing this with guano, which contains 16 per cent. on an average of ammonia, and of which 450 lbs. or 4 cwt. is considered a good dressing for an acre, this quantity containing 72 lbs. of ammonia, it appears that the same quantity would be given by the application of the sewage of the metropolis to 320,000 acres, or 500 square miles—the quantity of ammonia thus supplied being equal in money-value to £600,000 (£60 per ton). So much, then, for the value of the town sewage, of which it is unnecessary, we think, here to offer further proof. We therefore leave this department of our subject, and hasten to the consideration of the second division—namely, the modes proposed to utilize this sewage.

These may be classed as two—the liquid and the solid methods. On the former plan the sewage is proposed to be taken in its liquid form, and applied to the land, either after the plan of irrigated or water-meadow, or pumped with steam through pipes laid in various directions in the fields, and finally distributed over these by means of flexible hose and nozzles. In the latter plan, the sewage liquid is treated in such a manner as to cause its solid particles to be deposited, these only being made available for agricultural purposes, and applied in the same way as other manures of this class.

Of these two, the "liquid manure" plan has met with the greatest number of advocates—and this for a variety of reasons, two only of which, however, we propose to glance at; namely, (first) the comparative ease with which the fertilizing matter can be conveyed to any distance through the medium of water—this acting either by the natural power of gravitation, or pumped up by steam engines and forced through a series of pipes, after the manner of our water-supply system: this may be called the *engineering* point in its favour; (secondly), the higher value of the sewage in its liquid form as compared with its solid deposited matter—a large proportion of its fertilizing matter being held in solution, which no plan of deposition can make available: this may be the *agricultural* point in favour of the liquid manure plan; to which may be added another, that the valuable constituents are in the best possible condition to be quickly assimilated by the plants, or to be sucked in by the absorbent power of the soil. But while in consideration of these points the "liquid" system meets with more favour than the "solid," many conflicting opinions are held as to its paying capabilities—some asserting roundly that it can be conveyed from the towns and distributed

over the lands of the country at a rate which will be remunerative to all concerned; while others as roundly assert that this cannot be done, and certainly experience points to the latter opinion as being the most correct, for we confess to have a difficulty to understand how it is that capital, ever eager to have an outlet for its power, should be so indifferent to this great question, if it really is such a paying matter. And there is little doubt, if farmers could have a regular supply of liquid sewage containing a useful amount of fertilizing matter, that they would gladly avail themselves of it.

Unfortunately the apparent sanitary requirements are antagonistic to the agricultural ones of the question. For if it is correct, that in order to ensure the speedy removal of the foul refuse of towns from the neighbourhood of our dwellings, a large supply of water is necessary to act as a vehicle of conveyance through the ramifications of the drains and sewers, it is evident that in proportion as the amount of water is increased so is the value of the sewage as a fertilizer decreased. And this objection leads us to another, and a very forcible one, against the liquid manure system as altogether a paying one—namely, the high price of transmission or conveyance of the liquid sewage in this diluted state. The importance of this "cartage" or conveyance, cannot be overrated; indeed, the cost of conveying some manures would be greater than their value as fertilizers. The cheaper the manure per ton the higher this percentage of conveyance charges. Thus, if to convey a manure 10 per cent. of its value was charged, a manure one-fifth of the price would be mulcted with 50 per cent. of its value. Mr. Chadwick, who may be taken as *the* advocate of the liquid system, states that where it costs 15s. to convey a ton of solid manure, by his plan of liquid carriage transmission through pipes, 72 tons of liquid sewage can be conveyed for the same money. But, on the other hand, Mr. Lawes very pointedly remarks that in the state of dilution in which the sewage would be sent to the farmer, the 72 tons of it would only contain about 7-8ths of the average mineral excrete of one person; this being valued (and liberally) at 6s. would thus show a charge of 10s. for the conveyance of so much water. This is, indeed, the point upon which this part of the question turns: it is not the quantity of sewage which can be conveyed to so great a distance for so much money, but its value as a fertilizer, when supplied to the farmer. At no distant date, the amount of water supplied to the Metropolis will be equal to 50 gallons per head per day, which, according to the estimate already given of 46lbs. of solid matter obtained from manure from each individual, will only give to it 9 ounces of this fertilizing or solid matter.

But another point of view yet remains to be noticed—the usefulness of the sewage as a manure adapted to all crops. The question stands thus: To apply it in the way deemed best by the advocates of the system, it is necessary to go to considerable expense in laying down pipes, which, ramifying throughout the farm, enable the sewage to be applied at any desired part of its surface. This "plant," as it may be called, is permanent; and the

"interest" of the outlay is equally the same, whether the apparatus be used seldom or frequently, or used at all. Now, if the sewage so obtainable can only be used at certain seasons, and applied to certain crops, those limited applications must be so valuable as to pay a fair remunerative per-centage on the outlay required for the carrying out of the system. Now, in view of the fact that the great majority of agriculturists hold that the liquid manure cannot with advantage be applied to all crops, green and cereal, it certainly is an unfortunate matter that all the estimates of "cost" and "income" made by the advocates of the liquid system proceed on the supposition that the sewage *can* be applied with advantage to *all* crops, and that, consequently, an almost-continual demand will be made on the "pipe" system for a supply. But, even admitting this, which, we see, is a disputed point amongst agriculturists—namely, the applicability of the sewage to all crops—it is, further, an unfortunate matter that the estimates of "cost" of carrying out the system furnished by its advocates are considered by nearly every practical man who has investigated them as altogether too low.

Having thus stated the principal objections which have been brought forward against the liquid system, to prove that it cannot be carried out remuneratively, we proceed to notice very briefly the other method proposed—namely, the "solid or deposit system."

While there are many points in favour of the liquid system, the value of which is acknowledged by nearly all agriculturists and chemists, it is to be remarked that few have expressed a favourable opinion of its rival, or the "solid" system. We have already pointed out one great objection to the solid deposit of liquid sewage—namely, that it arrests only the least, allowing the most, valuable portion to pass away. Professor Way, a high authority, has stated "unhesitatingly that any existing plan for the production of solid manure from sewage-water would be a failure. He said this from a knowledge of the fact that, of the valuable matter contained in sewage-water, nine-tenths exist in a liquid state, and these could not be separated by any known process of filtration, nor could they be precipitated by any substance which they had at command." It need not be said, however, that there are others who take a different view of the solid system. Mr. F. Cooke, the exponent of Mr. Wicksteed's patent plan for deodorizing liquid sewage, and obtaining thus a solid manure, says, in his recent paper already alluded to: "I am not going to describe solid sewage as an English guano, worth £4 or £5 per ton, but as a substance containing ingredients especially valuable on heavy soils, and available near the place of its production. . . . It must be remembered that the great mass of farmers do not look alone to manures rich in nitrogenous matters. . . . Plants do not live principally upon nitrogenous food, not even those which most abound with it when harvested. Who ever thinks of giving his clover a nitrogenized manure? Gypsum or ashes are the most energetic stimulants to the growth of clover. Yet a crop of clover contains three times as much nitrogen as a crop of wheat. . . . Again, the clover-plant, after carrying off with it so large a quantity of

nitrogen, is one of the best preparers for a crop of wheat, which delights in nitrogenous manures. Solid sewage manure, therefore, should not be valued solely by the nitrogen it contains: nevertheless, it contains more nitrogenous matter than farmyard manure, besides many other substances which roots can seize upon during the gradual progress of decomposition." So much for the agricultural opinion in favour of the solid sewage manure of Mr. Wicksteed. As to a chemical opinion in its favour, we give part of Messrs. Aikin and Taylor's (Professors of Chemistry in Guy's Hospital) certificate: "We can state, from our knowledge and from our own experiments, that by your process the nitrogenous organic matter, as well as the phosphoric acids, dissolved or undissolved, would go down, and be returned in the solid deposit, while the water, after the precipitation is completed, will be discharged in a limpid state, and free from the offensive matter which it previously contained." The process, according to the same authorities, "furnishes to the agriculturist a cheap and useful manure." Mr. Wicksteed's process, which is apparently the most valuable and successful now before the public, is very simple, and manufactures the manure at a cheap rate. It consists in mixing the liquid sewage with a cream or hydrate of lime, in varying proportions, and drying the resulting solid deposit by centrifugal machines. The manure is then formed into bricks or slabs, which emit no smell. The resulting water is also odourless and colourless. There are various opinions as to the value of this manure. Mr. Lawes brought forward, at the recent meeting, an analysis which gave it a very low value; while Mr. Cooke stated that it was selling well, and at a remunerative price.

We have said little in favour of the liquid system; for, although various opinions are held as to its capabilities of being remuneratively conveyed to the country, and also as to its adaptability to all crops, it is acknowledged on all hands that it produces astonishing results when applied liberally to certain crops, as Italian ryegrass; and not a few of our agriculturists hold that the same results are witnessed when applied to the cereal crops. Of this, at all events, there is little doubt—that the sewage of our towns possesses a certain value as a fertilizing material; and that, whether applied in the liquid or solid form, a certain return can be relied upon. But, as we before pointed out, this "return" the towns, in getting rid of their refuse matter, should not look upon as essential. The primary point is the sanitary one. In any case, the duty is, to get rid of that which causes so much disease. To do this at a large expense would pay them in another sense, however, than an agricultural one: to get it done for nothing—that is, to receive an agricultural return for the fertilizing matter equal to the cost of its conveyance from the towns—would be still more advantageous, and would be doubly paying. That some return can be got, there can be no doubt. All experience goes to prove the truth of this: witness the amazing cultural results obtained by the use of sewage-water in the neighbourhoods of Milan and of Edinburgh. In view of what has been, and what chemists and agriculturists have shown

can be done, it seems worse than folly to inaugurate vast schemes of town-purification, which have for their ultimate aim the complete loss of the valuable matters.

"These would, under wiser and more provident treat-

ment, restore, through the intervention of vegetable life, in the succeeding year, a bounteous supply of the bread, 'the staff of life,' to the cottage of the poor, and every luxury of the season to the mansions of the rich."

## HOW TO FARM PROFITABLY.—THE LATEST ADVICES.

For the last few months agriculture has lost sight of Mr. Meehi. Even Tiptree itself, we should fancy, has but rarely been gladdened with his presence; while his usual seat at the Farmers' Club and other congenial trysting places has long known him not. And no wonder. There are few posts of honour associated with more downright hard labour than that he has lately been so energetically fulfilling. The never-ceasing round of dinners to begin with—that grave item in a City magnate's operations—the dinners with my Lord Mayor at the Mansion House; with the Judges at the Old Bailey; and with almost every Company or Association that can find just cause enough to have a dinner. How the worthy Sheriff must long by this for the beans and bacon of rural life! And, then, again add on to the customary routine of Sheriff duty the elections—the marchings and counter-marchings from London to Brentford, and from Brentford to London; the nominations and declarations in Guildhall and elsewhere. No wonder if the old love be forgotten, or only for the moment brought to mind, as some full-fed citizen dwells on what their worthy Chairman has done for the agriculture of his country!

But she is not forgotten, either. The agriculture of his country, indeed, has arrived at a remarkable epoch. Let it stand on the record, that within this last week, a work has been published telling farmers "how to farm profitably," and that this guide-book is written by one of the Sheriffs of London! It teaches, too, with all the decision and authority of the author's own experience—of one who "for several years has been deriving a most gratifying return from his expenditure." "How to Farm Profitably," in a word, is some further history of Tiptree, with its owner's general opinions of, and increasing acquaintance with agricultural matters. It is the annual balance-sheet paper of the Society of Arts, only without the balance-sheet. We gather, to be sure, everywhere that the farm is a most prosperous speculation:—"Our lands might support all our population, seeing my own farm is a practical illustration of the fact." "I sternly ejaculate that whatever does not pay in agriculture is not an improvement." "It would be happy for the bulk of our heavy-land agriculturists if they could raise their produce at as low a cost as I do mine." "I annex a list of what I pay for my work, and imagine it will make some of my practical friends scratch their heads." "If I find a heavy land farm properly divided, free from unnecessary fences, with good covered yards centrally placed, and proper and modern machinery—if I find it free from weeds, and above all know that 200lbs. of meat is made per acre per annum, the

result must be a certain profit." "The mass of mankind do not adopt my practice, else it would be impossible that such miserable and unprofitable discrepancies could exist in agriculture;" and, in short, "having proved my case."

This case is a very simple one. Question put—"How to farm profitably?" Answer arrived at—"As I do at Tiptree." We reach this, however, by rather a roundabout road. There are pages of figures to tell us how much is paid for labour, and yet more on the whole cost of a crop. There are pleasant details on feeding stock, managing horses, draining land, and making manure—all of which must tend to "a certain profit." But we are left still in a very uncertain state as to what this certain profit actually is. Let us cull what we can:—"The fact is that for several years I have been deriving a most gratifying return from my expenditure, and it is of a very enduring and continuous character; but the world does not believe it." "The difference in my produce and that of many others is from £5 to £10 per acre, at the recent liberal prices." "The average yield of my crops for several years has been, wheat over 5 quarters, barley 7 quarters, oats 11 quarters, and other things in proportion. My mangel wurzel are always good, varying from 25 to 40 tons per acre." "I often cut or feed Italian rye-grass four or five times during the season." "The original rental of my farm was a little over twenty shillings per acre. It is now more than double that sum, the excess being interest on improvements: now, instead of £1 per acre difference in the crops, as compared with what they used to be, fourteen years' experience has taught me that the difference is from £3 to £5 per acre, and in some crops £7 to £9 per acre. The average yield of the crops now and before the improvements may be represented as five to three at the very least." This last sentence is the most tangible of all we can deduce from the receipt side of the account. Now, will five to three pay for all the money laid out on Tiptree? Mr. Meehi's last pamphlet is evidently intended to be taken as a triumphant reply in the affirmative. Unfortunately we do not see it. It may, or it may not be. If, though, the result is so very satisfactory, it would have been far better, with the business-like accounts it appears that are kept, if the fact had been put a little more clearly before us.

The essay, indeed, throughout is very loosely put together. Mr. Meehi generally speaks with far better effect than he writes. There is a certain engaging manner and cheerfulness about him as an orator that we miss altogether in these more studied effusions. We

regret, moreover, to notice what we had hoped by this had died away—mistaken bitterness and ill-conceived animosity towards the practical farmer, that never have, and never can do any good. If he wishes to bring the farmers of England to his halloo, let it be with a cheer, and not with a rate. Let him remember, too, what he told us all to bear in mind at only his last summer gathering—how different it sounds to the tone of this pamphlet—“Recollect, you cannot do away with the farmers of England; and you cannot keep them humble. Every day their increasing intelligence and opportunities of intercommunication give them increased power,” and so forth. This is somewhat in contrast with the “agricultural lethargy and disbelief,” the “ignorance and prejudice,” and the “gross mismanagement,” of the present publication.

The chief interest of the work is centred in two tables—the one of questions, the other of maxims on agricultural matters. These are the questions to which Mr. Mechi “demands” answer:—

“Does drainage pay?—Does deeper cultivation pay?—Does economy of manure pay?—Does efficient shelter for stock pay?—Do large, well-squared fields, good roads, and good buildings pay?—Do ample manuring and more cleanly cultivation pay?—Does a larger employment of labour pay?—Does the employment of steam-power, improved machinery, implements, &c., pay?”

Of course, the answers here may be very varied and much qualified. Nothing, for instance, pays better than drainage, if it is well done; and nothing worse if it is not. Has every system tried at Tiptree paid? It is possible, again, to have too much even of deep cultivation; and the *real* economy of manure is a nice open question, which is still susceptible of some definition. To be armed at all points, let the reader ponder over the companion catalogue, the “**ESSENTIAL PRELIMINARIES TO PROFITABLE FARMING**”:—

“A thorough knowledge of your business, practical and theoretical.—Ability to buy in the cheapest, and sell in the dearest market.—To select the most able workmen of industrious and honest habits.—To choose as your bailiff a man of forethought, integrity, and firmness, combined with great industry and keen perceptive powers.—To apportion rightly your land and capital.—To maintain in economical efficiency the motive power, whether horse or steam.—Deep, frequent, and clean cultivation.—Drainage of land not naturally filtrative.—Shelter for stock.—Efficient machinery and farm implements.—Ample use of purchased food and manures.—Rigidly correct farm accounts, posted daily from the cash-book and journal.—Estimates of the cost and return of each crop in detail.”

Capital dieta are these, especially the first. Remember, all of you, young and old, what the cultivator of Tiptree tells you, and don't begin farming until you have “*a thorough knowledge of your business.*” And then buy the cheapest, sell the dearest, employ good workmen, drain your land, shelter your stock, have efficient machinery, and embark your capital in various other novel ways for farming profitably. It is very good advice, certainly; but we are half afraid there is not much of it will sound very new, even to the ignorant and prejudiced “practical man.”

In all that is so self-satisfactory and encouraging, we come only on one sad sentence, and that is the last. The Tiptree lesson will be taught no more—“In conclusion, having proved my case, and exposed my farm for many years to public inspection, it is now my intention to sit down quietly, and enjoy the privacy of agricultural peace and plenty.”

As a public man, then, as an agricultural authority, that is, we suppose we have to bid Mr. Mechi adieu. In doing so we are quite willing to give him credit for much good intention. He has marred, however, his own efforts by two serious mistakes—the assumption that he came ready-made to a business that time and experience could alone make him competent to carry out, combined with a certain sort of contempt for those who knew far more than he could teach.

### CORN GROWN IN ENGLAND DOUBLY ADVANTAGEOUS.

SIR,—In your journal, which is doing wonders towards the improvement in agriculture by adding science to practice, I beg to state that corn grown in England has a double advantage. As a proof, suppose an English farmer makes an exchange with a foreign manufacturer with £500 worth of corn for £500 worth of goods, half the commodities are raised by British industry and capital, and half by foreign industry and capital, therefore one-half goes to promote English industry and capital, and half to promote foreign industry and capital; but if an English farmer makes an exchange with an English manufacturer for £500 worth of goods of £500 worth of corn, all the commodities are raised by British industry and capital, and all is retained at home to support British industry and capital, which is doubly advantageous.

Is not the high price of meat, say mutton at 9d. per lb., under free, &c., enough to arouse our English statesmen from their lethargy in agriculture, and to forthwith bring our waste improvable land into high cultivation? Let them consider that Ireland contains about 19,500,000 acres of land, out of which there are 6,000,000 acres of waste land; out of the said waste land there are 4,000,000 acres admitted to be improvable, and out of the said waste improvable land there are 2,330,000 acres of bogs, all drainable, all improvable. Why not drain them, as they have drained the fens and bogs in Lincolnshire, and let the 4,000,000 acres of waste improvable land in Ireland be farmed upon the four-course system? There would be 1,000,000 acres sown yearly with wheat, which with high and good farming would produce yearly 4,000,000 quarters of wheat; this would be sufficient for bread and flour for 4,000,000 souls; 1,000,000 acres to be sown with other grain, 1,000,000 acres for clover and seeds, and 1,000,000 acres for root crops, all of which would produce a vast quantity of bread and meat, as food for man, and by British labour instead of foreign labour.

The great wildernesses in Great Britain and Ireland now are a disgrace to our country. Where are and have been the farmers' friends? as they have not given the heavily-taxed British farmers a North Lincolnshire tenant-right, *alias* equity between landlord and tenant for unexhausted improvements. Compensation is wise, just, and reasonable. The *Mark Lane Express* has said more in favour of tenant-right than all the other journals. I hope the new parliament will be more just, generous, and favourable towards the British farmers, for the great benefit of the lords of the soil, as common sense says their estates would be greatly improved by tenant equity; North Lincolnshire to witness.

Your obedient servant,

13, Norfolk-street, Hyde-Park.

SAMUEL ARNSBY.

## THE MOST ECONOMICAL MODE OF THRASHING CORN.

The various opinions that continually arise upon the most simple operations of farming processes were never more fully exemplified than upon the last discussion of the London Farmers' Club. The cause is obvious. Farmers from every district of almost every county in England are brought together, each expressing an opinion upon one subject, under the different circumstances of time, place, and population—of deficiency or supply of labour—of farm home-stalls centrally situated, with thrashing-floors in plenty, or without them altogether. In upland situations without hard roads, or in those more favoured where good roads approach almost every field. Added to these we are sure to be favoured with the dicta of others who have resided in towns during their whole lives, the would-be professors of agriculture, who read and talk of farming with the utmost gravity and importance, and even estimate the opinions of the practical and experienced with such an over-weening confidence as to leave the latter in some amusing doubt whether their experience stands for anything or nothing.

The question, as discussed, resolves itself into a very narrow compass, the cost of carrying out the operation of thrashing with the least waste of grain or injury to the straw being the pith of the question. This must ever depend upon circumstances of an external character, of which the chief would be whether labour was abundant or deficient—if convenient buildings for the conversion of the grain were at hand—or whether the quantity of straw produced was proportionately small or great for the requirements of the farm.

So far as experiments have been made, the cost of the operation is about 25 per cent. in favour of steam-thrashing upon wheat crops, and about 15 per cent. upon oats and barley. In districts where, on the one hand, labourers are plentiful; and, on the other, portable engines can be hired for the occasion at the customary prices, which are said to leave but a small margin of profit for the owners.

We have calculations before us, from experienced persons upon the subject, that, upon investigation, show the difference of cost is about that already stated; while we presume the observations of Mr. Bennett, the proposer of the subject, were made rather to show the occasional drawback of steam-thrashing, by the slovenly and wasteful manner in which it is carried out in his district, than to discuss its utility, an abuse, which, in our opinion, is fully corroborated by the practice in other portions of the kingdom. Indeed, we happen to know a case that ended in an action at law, in which it was proved, and substantiated before a competent arbitrator, that the waste that occurred by the thrashing-out a whole crop immediately after harvest by steam

power was such as to inflict a large amount of damage to the in-coming tenant. It was observed by Mr. Baker at the meeting, that the damage sustained by such a process was, in his opinion, as well as in that of other practical men in the eastern counties, equivalent to, in many instances, the whole cost of the thrashing, and at all times equal to one-third of the value of the straw for feeding purposes. And, although this was contradicted by others who followed, we are inclined to infer from the resolution adopted that his assertion deserved its full share of attention, corroborated, as he stated it was, by the practice of the valuers in the districts referred to. Wherever convenient homestalls are erected centrally upon farms, as stated by Mr. Bradshaw, the least expensive mode would be to carry home the whole crop in the first instance, and this for two reasons:—that it never can be compressed again after thrashing into the same bulk, and that the extra cartage and waste by stacking and thrashing in the fields would more than amount to any difference of value or convenience supposed to be gained by harvesting on the spot.

Upon many large arable farms the value of straw is but little appreciated. It too frequently is treated in the most wasteful manner, being looked upon in such cases as an article not worth the care of the farmer; whilst upon other farms, where many roots are produced, and large numbers of cattle are kept, the utmost economy of it is requisite, so as to afford a regular supply of fodder and bedding for the cattle from the early part of November until the end of April. In such cases the practice adverted to by Mr. Baker, of thrashing out the wheat by machinery, and the Lent-corn by flail, would to a certain extent become requisite to produce that degree of economy and supply necessary to effect the object.

As regards some of the other statements, we must differ from Mr. Williams in his assumption of economy by erecting farm homestalls at the various spots where the crops of grain and turnips are produced. Such a division of labour during winter, with the expense of constructing and putting-up temporary buildings, supplying them with water, &c., would far outweigh all other advantages to be derived by such a process of management. Assuming that from every acre of grain the straw would produce from two to three tons of manure, ten acres of wheat-straw would produce thirty tons, the expense of carting which back would not in most cases exceed three shillings per acre, or in all thirty shillings. Allowing, again, half an acre of roots to be consumed with each acre of straw, say eight tons, the whole price for carting them home would not exceed one shilling per ton for carrying them the extra distance, altogether amounting to about eleven shillings

per acre, or upon each ten acres of wheat, the quantity usually contained in a single stack. This calculation is sufficiently near to convince every one that a direct loss would ensue by any attempt to set up buildings and feeding apparatus, with sufficient room and attendance, for the occasion year by year as it might arise. Circumstances must always govern the rule of practice best calculated to secure to the farmer the utmost advantage; while if such matters were duly considered, and the results estimated before-hand, we should not hear of discrepancies that appear but too frequently to be given in a spirit of opposition that scarcely accords with the more important considerations of seeking for and demonstrating the truth and soundness of the principles involved.

### STEVENS' METHOD OF BREAD MAKING.

On Tuesday a number of scientific gentlemen, physicians, &c., were invited to the Polytechnic Institution, to witness the results of the improved system of fermenting and making pure bread, as practised by Mr. C. Stevens, at his bakery in the Cambridge-road, near the Eastern Counties Railway station. Mr. Pepper undertook to explain the chemistry of bread-making, and to show the different stages of the process as conducted by Mr. Stevens, and by London bakers. He pointed out, in the first place, the chemical constituents of flour and of bread. Good unadulterated bread contains the large proportion of 78 parts of water in every hundred, so that even when bread is pure it does not contain more than 22 parts of nutritive matter, and the adulterated article frequently contains very much less. There are different modes of adulteration commonly practised, some of which have for their objects to improve the appearance of the bread when it is made with coarse or with mixed flour; and other modes of adulteration increase the quantity, by causing a larger absorption of water. Mr. Pepper alluded to the plan of bread-making which was introduced into this country, a few years ago, by some French chemists, who professed to be able to make a much larger quantity of bread from a given weight of flour than had been before done. Their plan was put in operation at Marylebone Workhouse, where, from a sack of flour, they made double its weight of bread. The process was conducted secretly; but Mr. Pepper, who was requested by the workhouse authorities to analyze the bread, discovered that the effect was produced by the addition of boiled rice and a small quantity of alum. By this means the dough acquires greatly increased power of absorbing water, and, by using the same agents, Mr. Pepper said he had succeeded in making even a larger proportion of bread from a given weight of flour than the French chemists. Bread of that kind is not unwholesome, but as it contains a smaller proportion of nutriment, it is unfair to sell it as wheat bread. The proportion of rice which Mr. Pepper employed was 1½ lbs. to 1½ lbs. of flour. Mr. Stevens, for the purpose of showing the effect of rice when thus introduced, had brought to the institution a large pile of loaves, which he had made from 1½ lbs. of flour, with the addition of rice. It presented the appearance of very good bread, and was

well tasted, and it possessed the property also of not becoming so dry as ordinary bread. Mr. Pepper then noticed the more objectionable adulterations to which some bakers have recourse, even to the introduction of sulphate of copper, a few grains of which in a sack of flour produces great effect in the working of the dough, and in the appearance of the bread. The common process of bread-making, as adopted by bakers in general, was then noticed, and samples of the yeast and of the dough in its various stages were placed on the lecture table for illustration, together with a number of loaves that had been purchased from cheap bakers, to contrast with the pure bread made by Mr. Stevens. The process adopted by the latter was then described, and illustrated in the same manner by a variety of samples. The chief difference between Mr. Stevens' system of fermenting the dough and that of other bakers consists in a previous mixture of the yeast into a thin batter with flour and water. The yeast he uses is obtained from pale-ale breweries, and the mixture of it with the flour is allowed to ferment for 24 hours. He then uses it as bakers usually employ the unmixed yeast, and he finds that the fermentation with the diluted yeast is more diffused and effective, and there is less risk of the bread tasting bitter. The specimens of dough undergoing fermentation certainly showed great activity in the process. The purity of Mr. Stevens' bread depends much on the care he takes to obtain unadulterated flour, and the results were proved most satisfactorily by specimen loaves of the bread, which were distributed among the company. The taste of the bread was enough to prove its purity, and was, for practical purposes, better evidence of its excellence than the microscopical tests to which it was subjected by Dr. Hassall. Diagrams of the appearance of flour and its adulterations, as magnified by a powerful microscope, as taken by Dr. Hassall, were exhibited, and there were also shown numerous specimens of meal and flour in different stages of progress. The lecture formed altogether a very interesting exposition of the subject of bread-making and its adulterations.

### FARMERS' BOYS.

Out in every tempest, out in every gale,  
 Buffeting the weather, wind, and storm, and hail;  
 In the meadow mowing, in the shady wood,  
 Letting in the sunlight where the tall oaks stood.  
 Every fitting moment each skilful hand employs—  
 Bless me! were there ever things like farmers' boys?

Though the palm be callous, holding fast the plough,  
 The round cheek is ruddy, and the open brow  
 Has no lines and furrows wrought by evil hours,  
 For that heart keeps wholesome, trained in nature's bowers.  
 Healthy, hearty pastime the spirit never cloys;  
 Heaven bless the manly, honest farmers' boys

At the merry husking, at the apple tree,  
 How their hearts run over with genial harmless glee!  
 How the country maidens blush with conscious bliss  
 At the love-word whispered with a parting kiss!  
 Then the winter evenings with their social joys—  
 Bless me! they are pleasant, spent with farmers' boys.  
 —*Merry's Museum.*

## IMPORTANT SALES OF SHORTHORN STOCK.

However great the political agitation in which the country has been placed since the dissolution of parliament, it is remarkable to note how insignificant its influence has been upon the breeders and fanciers of Shorthorns. On Thursday, April 2, on the occasion of Mr. Ambler's sale at Watkinson Hall, Halifax, the attendance of buyers included gentlemen from all parts of the United Kingdom, as well as from France, Germany, the United States, and Australia. These came not merely as idle spectators, but bid against each other with a determination almost unprecedented, to possess themselves of some of this celebrated breed. On the following day Mr. Strafford, the same auctioneer, sold off the herd of the Rev. T. Cator, at Skelbrook Park, Doncaster, and again ran his lots up to very good prices. We attended these meetings with a view of judging for ourselves of the importance in which these herds were held by the Shorthorn world. Without advancing anything in disparagement of those important sales which already form a page in our agricultural history, we must say that we never witnessed so large and at the same time so select a company, or one more really in earnest, than we did on Wednesday, April 1. The world-wide celebrity that Mr. Ambler as a breeder has for many years obtained, would naturally, under ordinary circumstances, create a sensation when such a herd was announced for sale. When, however, our readers are informed that fifty animals, many of them young calves, one only two days old, realized an average of about £84 per head, they will be enabled to form some idea of the determined competition and thorough appreciation this celebrated herd has maintained to its dissolution. The proceeds of the sale amounted to the extraordinary sum of four thousand one hundred and sixty four pounds, being a slight advance per head on that realized by Sir Charles Knightley in the spring of last year.

It has often been declared that the best blood of this country has been reduced by the constant export of our highest bred animals to our colonies, the "States," and the continent. But here, at least, it will be seen, that buyers from those distant regions had to succumb to the spirited enterprise of our own countrymen; while it is, further, highly satisfactory to note that it was not England and Ireland alone in the market, but that the same active spirit of improvement in breeding has extended itself in a most remarkable manner both to Scotland and Wales. Many of the best animals were knocked down to noblemen and gentlemen resident in those quarters.

Amongst others were Sir Robert Pigot, F. Crossley, Esq., M.P., E. Akroyd, Esq., M.P., Colonel Pollard, Dr. Wright, Dr. Paley, Rev. W. Gillmor,

Illingworth; J. Appleyard, Esq., J. Whiteley, Esq., M. Stooks, Esq., Catherine Slack; G. Haigh, Esq., J. Bould, Esq., F. Harcastle, Esq., W. Posgate, Esq., Skircoat; T. Turney, Esq., T. Milne, Esq., Warley; James Aked, Esq., Kershaw House; Wm. Holland, Esq., Lightcliffe; T. Edleston, Esq., Halifax; W. Edleston, Esq., Sowerby Bridge; W. Murgatroyd, Esq., Luddenden; D. Carter, Esq., Lightcliffe; J. Ambler, Esq., Peel House; J. Charlesworth, Esq., Thornhill Lees; James Douglas, Esq., Athelstaneford, Edinburgh; M. S. Stewart, Esq., Southwick; Jas. Martin, Esq., Clayton West; R. Booth, Esq., Warlaby; G. Bland, Esq., Lincolnshire; J. Thompson, Esq., near Hull; — Goldthorpe, Esq., Cleckheaton; William Torr, Esq., Aylesby Manor, Lincolnshire; H. Smith, Esq., S. E. Bolden, Esq., J. Brook, Esq., Brighouse; W. Verner, Esq., Ireland; A. H. W. Farrell, Esq., Lanarkshire; A. Young, Esq., Perthshire; D. Peacock, Esq., near Harrogate; J. Jolly, Esq., James Sutcliffe, Esq., Great Alderley, Chester; J. Brigham, Esq., near Malton; C. Taylor, Esq., Cumberland; W. Hetherington, Esq., Brampton, Cumberland; A. Wood, Esq., Wigan; G. P. Tuxford, Esq., London; F. Holroyde, Esq., steward for Miss Clara Thornhill; Wm. Wetherell, Esq.; J. Woods, agent for the Earl of Balcarres; J. Scott, agent for F. H. Fawkes, Esq., Farnley Hall; W. Carr, Esq., Settle; Thomas Chrisp, Esq., Alnwick; J. Atkinson, Esq., Newcastle; — Brodie, Esq., Australia; Mr. Wood, Halifax; and Mr. Roper, Halifax.

We dwell with more than common interest upon this, illustrative as it is of the growing intelligence of the age in which we live. When we consider the increasing millions of our population, and the enormous amount of animal food essential to their very existence, we hesitate not to say that no man who has the welfare of his country at heart can do better than by disseminating such specimens of well-bred animals. Furthermore, we believe that no gentleman, however elevated his position, can set any example to his fellowman, tenant or otherwise, that is better calculated to elevate him in public estimation, than by thus devoting his means, and affording his support.

It would be not well to pass over the gratification we realized on looking over the stock and premises of Mr. Ambler. Of the former we have already spoken. The premises are constructed of stone; and better buildings, whether in design or arrangement, it has rarely been our fortune to inspect. We believe Mr. Ambler was his own architect; and certainly the premises do him the highest credit.

The successful competitors included the following noblemen and gentlemen:—Mr. G. Townsend, Hinckley; Mr. J. Wood, Wigan; Mr. James Sutcliffe, Great



Alderley, Chester; Mr. Foljambe, Osberton, Retford; Mr. George Bland, Colby, Lincolnshire; Mr. John Peel; Mr. W. Hetherington, Middle Farm, Brampton, Cumberland; Mr. W. G. Jolly, agent for the Duke of Montrose; Mr. C. Taylor, Crosshill, Wigton, Cumberland; Hon. Col. Pennant; Mr. Torr; Duke of Montrose; Mr. D. Peacock, near Harrogate; Mr. Campbell, Aberdeen; Sir Robert Pigot, Cambridgeshire; Wm. Stirling, Esq., M.P. for Perthshire; the agents of the Illinois Agricultural Company, United States; Alfred H. W. Farrell, Esq., Lawrencekirk; D. S. Wemyss, Esq.; Mr. Charlesworth; Mr. John Yorke, near Ripon; Mr. Carter; Mr. Ferrand; Mr. Metcalfe, York; Mr. Vermer, Vermer's Bridge, Armagh; Mr. James Douglass; the Earl of Burlington; Mr. Abbott, Newark; Mr. Thorne, Thorndale, New York; Mr. James Dickenson, Leeds; Mr. Mark S. Stewart; Edward Akroyd, Esq., M.P., Denton Park; Mr. Armstrong, Chesterfield; Mr. Brigham, Slingsby, Malton. Mr. Torr, of Aylesby, was the purchaser of the highest-priced cow "Britannia," which realized 270 guineas; and Mr. Thorne, of the United States, the celebrated bull, "Grand Turk," for 300 g.

On the following day the herd of the Rev. Thomas Cator, of Skelbrook Park, near Doncaster, were also

submitted to competition by Mr. Strafford. The weather was extremely unpropitious; the company was, however, large, and withstood throughout the whole of the sale the pelting rain, which continued without intermission. The number of animals offered for sale amounted to 58, out of which 57 were sold at prices averaging about £56 each. Mr. Eaton bought the highest-priced cow for 100 guineas, and Mr. Townshend the next highest for 85 guineas. The bull "Duke of Cambridge" was knocked down at 180 guineas, to Mr. Holland; and "Schamyl Bey" was purchased by Mr. Wentworth at 135 guineas; "Duke of Wellington," by Mr. Bell, for 105 guineas.

In concluding our remarks, we have to congratulate the breeders of short-horned stock upon the result of these sales; evidencing as they do the increasing value of this breed of animal, and which cannot fail, in our opinion, to stimulate the owner of every herd in the United Kingdom to improve as far as possible, by judicious care and crossing, his own tribe. It is due to Mr. Strafford to state that he discharged the onerous duties of his office in an able and gentlemanly manner, which ensured for him general approval; giving satisfaction alike to those who employed and those who supported him.

## THE AGRICULTURAL COMMERCE BETWEEN ENGLAND AND FRANCE.

We have long stood on very fair give-and-take terms with our friends over the water. We have learnt to appreciate to the full the excellences of each other. Here we prize French cooks, French wines, and French milliners. There they delight in English horses, English hounds, English grooms, and all the English customs of the course and the chase. We have gradually got even further than this. If France supplies cooks England supplies meats; and so we can still extend our exchange and barter, and still, too, with mutual advantage. Within this year or two Monsieur has had many a cut at a well-fed haunch or noble sirloin; gradually, with his increasing experience, becoming reconciled to that once-terrible sight to a Frenchman's vision, "the gravy that followed the knife." Our agriculturists, on the other hand, who have supplied these prime pieces, have improved wonderfully in matters of taste since their sojourn in Paris. They incline now to bœuf "à la sauce piquante," with pommes-de-terre "à la deuced good;" suggest omelette and cotelette at market ordinaries, and prefer sparkling Moselle to home-brewed beer. We know one who has been able to face nothing heavier than hock or claret since his summer of 'fifty-six. Indeed, if this kind of thing goes on, it will be all "au naturel" in France, and all "à la carte" in England.

And we really see no reason why it should not. In

fact, it is going on. We are not merely helping our French friends to breed good stock, but we are showing them how to feed them. Now, feeding stock in France is even less understood than the more important science of producing it. The sauce piquante has rendered our neighbours indifferent to really good meat. An artistè who could manufacture three or four famous dishes out of a pair of old boots would never be very particular about his matériel. With the command of good stock, however, they will come to appreciate good beef; and a few years hence the very Parisians who shuddered last summer at the fat "monsters" brought over, will be fattening and prizing such "monsters" themselves.

It would be idle to suppose that the French and English International Fat Cattle Show is likely to become an annual exhibition. We regard that just celebrated as something of a first lesson for France, which she should at once get off by heart. It could never pay our breeders and feeders to send stock so far. As it is, our own correspondent records the meeting as a very successful one; although we confess we miss many a name, amongst the English exhibitors especially, that we had thought might have been well represented. The time of year, to be sure, is rather against a fat stock show; while highly fed animals are very ticklish goods to hazard on a rough journey by land and by

water. We repeat, the experiment is a laudable and an interesting one; at the same time that it would be worse than folly to persuade either ourselves or our allies that its success can be ensured hereafter. To be mutually advantageous, the exportation of stock from this country to France must be in breeding animals, and not with fat cattle. It will then remain with our customer to decide whether his Shorthorn cross shall appear before him as *bœuf à la mode*, or, trusting simply to its own merits, as roast or boiled.

There will be some rare quality at any rate to begin with. Three or four of the most distinguished visitors at Poissy have already been equally distinguished in England. There was Mr. Stratton's white short-horn, the gold-medal beast at Birmingham; Mr. Heath's Devon, the selected at Smithfield; Lord Hatherton's Hereford; the Duke of Beaufort's short-horn, and other as noble animals from over the Border. One test of the Poissy show will be the prices the stock fetch as butcher's meat. We have only to hope that none of ours will be allowed to return. They have many of them been far too long in the stall as it is; and would no doubt have been slaughtered for Christmas beef but for the announcement of this spring meeting. Let them now by all means fulfil their mission. Indeed, when we come to reflect on "early maturity," "return for outlay," and other farmers' questions, one gets rather tired of seeing a full aged, full fed animal at a succession of fat stock shows. "Confound you!" said the dandy to the sponge-cake elephant, that he knew by a notch in his tail as having had the pleasure of meeting on many previous occasions. "Confound you!"—and here he smashed his head with a spoon—"I suppose you are meant to be eaten as well as looked at." When one finds Mr. Stratton's or Mr. Heath's fat cattle at Gloucester, Birmingham, Smithfield, and Poissy, we begin to question with the exquisite, whether they are really meant to be eaten, or only looked at.

We shall leave our correspondent to tell his own story. We may, however, draw a deduction or so from the facts he reports, and these must bear chiefly on the exhibition of native stock. They would appear to have been of the most primitive kind. That is, they were of all sorts and sizes, bred with but little care, and showing few characteristics to be depended upon. Still, from all this chaos we gather some satisfactory evidence of the progress France has already made. In doing so we once more raise a good genius that is now continually appearing before us—a calm, mild-eyed beauty that looks like a modern personification of the

Goddess of Plenty. For these last few years past more especially, there has been nothing so highly praised as the short-horn. People are perpetually declaiming on its virtues, and we ourselves, perhaps, amongst the first open to an indictment. Fortunately, however, and strangely too, it would seem worthy of all that has been said of it—and that is saying something. What the short-horn has done for America or what it may do for Australia, it is not our purpose here to discuss. Let our correspondent declare its influence in France:—"By the side of these numerous breeds, one was pleased to observe throughout all the regions a large proportion of animals which, although they still possessed some faint characteristics of the breed from which they sprung, yet manifested betrayed the blood of their sire, namely, the Durham. It is indeed a pleasing and especially a hopeful fact to record, that all the cross-bred animals exhibited had, more or less, the Durham element in their blood; and whilst so large a share in the prizes was given to the local breeds of the various districts in which the show is divided, no less than 53 Durham or cross-bred Durhams were exhibited by the French—about one-fourth of the whole exhibition. This fact plainly shows that French breeders not only are on the right track, but, by the generally excellent quality of the stock thus improved, it proves also that they have made rapid strides in the arduous way of progress."

We may take a very practical comment from this. It is now some twelve years ago that the Minister of the Interior of France spoke at a cattle show held at this same Poissy. In his remarks apropos to the occasion, he said, that although the French agriculturists had imported the best bulls and cows from England, they were obliged to keep up the supply of imports, as otherwise the stock again deteriorated in three generations, and he attributed this greatly to the bad pasturage. There was evidently a desponding tone at that time, which exists no longer. The Shorthorn has outlived the three generations, and the seeds of the breed are now diffused through various parts of France. As our reporter says, "the French breeders are on the right track," while there is every encouragement for them to persevere. Let them but continue to cross with our pure-bred animals, and they must continue to progress. There is even a chance now of the pasturage being improved; and the day is not far distant when they may leave the sauce piquante to Jonas Webb and Brandreth Gibbs, proudly content themselves with the plain joint of Merino mutton, or Shorthorn beef.

## THE POISSY FAT CATTLE SHOW.

PARIS, April 9th, 1857.

It is often an arduous task to report an agricultural meeting to agricultural readers. The object of these celebrations being always the same—prizes, things exhibited, show-yards, the individuals who make it their business or pastime to be present, the speeches delivered, and so forth, bear such analogy with those of similar occasion, that one has frequently enough to do to interest the keenest of readers upon such topics.

We are, however, relieved of any such difficulty on the auspicious occasion of the Poissy Show. Its novelty and vast importance as regards the future intercourse of our agriculture with that of France, are suggestive of so many reflections—have given rise to so many incidents, that our narrative, however imperfect it may be, cannot fail to command some interest and attention.

Let us premise by saying that England and Scotland have come forward in a manner worthy of both to sustain the character of those breeds of animals which are their pride and their boast, and which, by means of a comparison as complete as it was splendid, have established in the eyes of the world that pre-eminence in the art of agriculture the great Paris Show of last year rendered so manifest, either for breeding animals or agricultural implements.

England contributed at Poissy 4 specimens of short-horns, 7 of Devons, 8 of Hereford, 6 of Scotch breeds, and 1 of the Hereford and shorthorn cross breed: in all 26 heads of cattle. Our Scotch neighbours had of our breeds only 2 shorthorns; but they came out strong and gloriously in their own races. They contributed 11 heads of polled cattle, 9 of West Highlanders, and 9 of cross breeds: in all 31 heads of cattle. In the sheep classes we had 4 pens of Cotswold, 2 of Southdown, 2 of Cheviots, and 3 of cross breeds: in all 11 pens. Scotland had sent 1 pen of Southdowns, 3 of Cheviots, 2 of black-faced, and 3 of cross breeds: in all 9 pens of sheep. Thus the English and Scotch contributions to the great Poissy Show comprised in all 57 heads of cattle, and 20 pens of sheep.

Before we speak of the respective merits of these animals, and chronicle the impression their portly appearance has made upon the French agriculturists, and other visitors, who crowded around them to criticise and to admire, let us retrace our steps a little, and give a short narrative of the journey to Poissy.

The village of Poissy—for we can hardly give the name of town to the dirty enclosure of crooked streets and uneven, dingy-looking habitations, in which the Show took place—is situate on the Paris and Havre line, about 21 miles distant from the French capital. It lies at the western extremity of the picturesque and beautiful forest of St. Germain, and the immediate

neighbourhood by which Poissy is encircled greatly contrasts by its charms and beauty with the filthy interior and wretched houses of the town.

Poissy being a station on the Havre railway, it was evident that the shortest and altogether the most eligible route to reach it with cattle was by way of Southampton and Havre; and it was by that route that the bulk of the English exhibition travelled.

On Friday morning, 3rd of April, a steamer, especially hired for the purpose, embarked the beasts in the Southampton-docks, where they had been detained one day by the stormy weather that prevailed all the week in the Channel, and were safely landed at Havre, where they arrived the same evening, after a beautiful passage of about 12 hours, early on Saturday morning. By the evening of the same day they were snugly consigned to the stables which had been prepared at Poissy by the French Government; thus accomplishing a safe and comfortable journey from Southampton to Poissy in little more than 30 hours.

Owing to the special arrangements which had been carefully made at Havre, the steamer was enabled to reach the eastern extremity of the docks, and to discharge her precious cargo within a few yards of the railway goods' station; thus sparing the cattle a fatiguing, nay impossible, walk of nearly three miles. The Scotch animals had arrived in London so early as the middle of the previous week, and selected the route *via* Newhaven and Dieppe, where they experienced a safe but stormy passage. Another small lot of English arrivals crossed by the more fashionable, but we must say less expeditious and more dangerous passage for fat cattle, of Folkestone and Boulogne, and had to come round by way of Paris.

At all events, with the exception of one or two sheep lost on the way by an exhibitor who went from London-bridge to Calais in a perfect storm, all the cattle, their owners, and attendants, reached Poissy in safety. So that on Monday last, when the signal for bringing the cattle into the Show-yard was given, Old England drew up by the side of her allied and friendly hosts, under a profusion of tricoloured flags, in the maze of which we were rather disappointed not to observe the blue waves of the union-jack. Such a glorious sight of beef and mutton never before greeted the marvelling eyes of a Frenchman.

The show was held in the market-place, Poissy being the Smithfield of Paris. Canvas canopies had been erected over the pens; and we could not help remarking that the cattle, with plenty of air, plenty of light, and plenty of space, looked to infinitely greater advantage than when collected beneath the dingy galleries of the Bazaar in Baker-street. Although this season of the

year is by no means a favourable one for holding a show of fat stock, it was noticed by everybody how fresh and well the animals looked, notwithstanding the never-ceasing poking and handling of the Paris butchers, who attended in crowds.

The operations of the judges lasted two days, during which, through the kindness of M. de Ste. Marie, the Commissioner-General of the show, we were enabled, in company with several other representatives of the English Press, to take a quiet survey of the whole exhibition before it was thrown open to the public.

The French exhibition was divided into *regions*—that is, districts of the country comprising a certain number of departments competing among themselves. Thus the first region embraces the Northern departments and the neighbourhood of Paris, the second comprises the Western districts, the third the Central and South-Western, the fourth the Central proper, the fifth the Central and Eastern, and the sixth the whole of the South.

Each region is divided into *categories*, the first embracing animals of all breeds, and the other the respective breeds only peculiar to each region. Besides these divisions, there are also prizes offered to what are called *bandes de bœufs*—that is, lots of four bullocks; and then, as is the case in our English exhibitions, there is a prize of honour given to the best animal in the bovine, ovine, and porcine races, respectively.

There were exhibited in the first region 25 oxen, 45 in the second, 45 in the third, 12 in the fourth, 16 in the fifth, and 24 in the 6th—in all, 167. There were, besides, 48 oxen in lots of four, and 16 fat calves—making a total of 231 head of cattle of various breeds.

In glancing over the catalogue, one was forcibly struck with the diversity and numerous varieties of the French breeds of cattle; and in looking over the show-yard, this diversity was fully borne out by the alternations of character, colour, and shape, typified in the most unmistakable manner. By the side of these numerous breeds, one was pleased to observe throughout all the regions a large proportion of animals which, although they still possessed some faint characteristics of the breed from which they sprang, yet manifestly betrayed the blood of their sire, namely, the Durham. It is indeed a pleasing and especially a hopeful fact to record, that all the cross-bred animals exhibited had, more or less, the Durham element in their blood; and whilst so large a share in the prizes was given to the local breeds of the various districts in which the show is divided, no less than 53 Durham or cross-bred Durhams were exhibited by the French—about one-fourth of the whole exhibition. This fact plainly shows that French breeders not only are on the right track, but by the generally excellent quality of the stock thus improved, it proves also that they have made rapid strides in the arduous way of progress. But at the same time we cannot conceal from ourselves, and we think it our

duty to tell them, that they are still far behind in the improvement of their stock, and the comparison they have had so happy an opportunity of making between their breeds and ours, between their modes of fattening and ours, between the results of their skill and ours, must have plainly and forcibly reminded them of their marked inferiority in those respects.

We can scarcely think that the encouragement apparently given by the French Government for the preservation of their many breeds of cattle in all their native purity can be conducive to progress—with the exception only of a few which might be easily improved, such as the beautiful Charalais and the picturesque Cotentin, so remarkable for their milking qualities—and perhaps one or two others. The generality of the French breeds of cattle are incapable of improvement while kept to themselves. Their characteristic peculiarities are essentially bad, and so strongly typified, that they must of all necessity reproduce themselves in the offspring, however comparatively good the genitors may be. In England we have reduced our principal breeds to three—the Shorthorns, the Hereford, and the Devon; and by thus concentrating skill and patient perseverance upon these breeds we have been enabled to bring them to the very acme of animal perfection. With the advantage of our experience and knowledge, we cannot but think that the French might do likewise; they have in their Government a strong and powerful lever which can centre the efforts of all towards any given aim, while it is only by such a united effort towards the same end that success can be secured.

If the cattle portion of the French Exhibition was far from being remarkable, and powerfully contrasted with our own, we feel in justice bound to say that their sheep beat ours in condition and quality, although decidedly inferior in symmetry. The cross between the Merino and the Leicester sheep was beautifully represented by the pens exhibited by Messrs. Fournier and Pilat, the latter of whom was most deservedly honoured with the silver cup. That gentleman purchased last year at the Great Paris Exhibition one of the best tegs entered by Mr. Sanday, of Holme Pierrepont. So spirited a breeder justly deserves the success he has obtained. May he find many imitators in this country!

Among the French cattle we observed some very good shorthorns. One lot of four, exhibited by the Comte de Torey (who gained also the prize of honour for a shorthorn) was very remarkable, and clearly showed what improvement can be attained by a judicious crossing.

We now come to the appreciation of our own exhibition, and the award of prizes. Among the shorthorns exhibited the Duke of Beaufort gained the first prize for oxen under three years old, and also the prize of honour—a gold medal in his Grace's case; as not being the breeder of the ox he exhibited, the 120-guinea cup could not be awarded to him. The animal was indeed a worthy offspring of the celebrated Oxford

tribe, from which he is descended by his sire, the Fourth Duke, and was highly admired by the French breeders for his quality and symmetry. He was sold to one of the principal butchers of Paris for £80.

The second and third prizes in the same class were gained by Messrs. Beveridge and Gulland, for two excellent beasts, which, however, did not sell quite so well.

The first prize in the older class was awarded to Mr. Richard Stratton, of Broad Hinton, for the same white ox that obtained a similar distinction at the late Smithfield Club Show. This ox, already well known to most of our readers, was subsequently sold for £68. The second prize was awarded to Lord Leigh for an ox four years and two months old, which fetched £56; and the third prize to Mr. Tuck, of Strumpshaw, Norfolk, for a five-year-old ox, which was sold for £64.

In the Devon classes the Earl of Leicester exhibited four very beautiful animals, three of which gained prizes. Mr. Heath, so well known by his success at our own exhibitions, sent two oxen of that breed, which gained a first and a second prize respectively. The Gold-medal Ox of last year's Smithfield Show was also exhibited at Poissy by its present owner, Mr. Potter, of Witton, and, as a matter of course, gained the first prize of its class. A mistake occurred in the sale of that beautiful animal through the imperfect pronunciation of the French interpreter employed by Mr. Potter, an error which implied no less a difference than £36 in the alleged amount of the purchase. Mr. Potter thought he had sold it for £65, and the buyer being under the impression that he had bought it for £29: the bargain was of course cancelled, and the ox sent back to England.

The Hereford classes were as well represented as the most enthusiastic admirer of that beautiful breed could wish. On the occasion of the Paris Exhibition of last year, we exclaimed, What have the Hereford men been about? The scanty number of animals in that class were actually lower than the number of prizes offered. The excuse some of our correspondents gave was a good one. In the year previous, their best animals were discarded and disqualified for showing too manifestly their tendency to fatten. The Poissy Show was a favourable opportunity for them to redeem their character, and triumphantly establish the excellence of their breed, which a hasty judgment had somewhat underrated in 1855. We must say that the eight animals exhibited in that class, and particularly those entered by Lord Hatherton, which gained the first prize in the young class, and by Messrs. Heath, Powell, Naylor, and Shaw, who divided the other awards, were as good specimens as have been produced in any English show. The selling price of those that were sold was exceedingly good, and showed how highly they were esteemed by the Paris butchers.

The Scot breeds were most numerous and admirably represented at Poissy. Our readers will recollect how the foreign breeders and visitors to the Paris Show

of last year were taken with the black-poll'd cattle, and how readily they were disposed of by their owners. At Poissy they were not less admired; and we think that Messrs. Mc Combie and Stewart have every reason to be pleased both with their success and the price they obtained for their animals. These two gentlemen divided the rewards in both classes. Here, however, it is our painful duty to notice a most unpleasant incident which occurred about the award of prize<sup>7</sup> in the young class of the Black Scot breed. Mr. Heath had exhibited a very perfect animal, to which the judges awarded the second prize. An objection was raised, however, as to the purity of its blood, and letters were put in, one of which, written by the breeder, positively stating that not only that the ox exhibited by Mr. Heath was the produce of a cross between a Shorthorn bull and a black polled cow, but that Mr. Heath having written to him to ascertain the age of the animal, he had in his reply plainly stated the fact of its not being a pure-bred Angus; thus implying that Mr. Heath had wilfully made a false entry. So serious a charge could not well remain without being fully investigated. Upon informing Mr. Heath of what had occurred, he indignantly denied having ever been told that his ox was by a Shorthorn bull. He had bought it on the London market, and had merely written to the breeder to ascertain its exact age, but in the reply no allusion whatever was made as to the purity of its breed. We cannot help thinking that the protest came in rather late; and that it would have been more according to the rules of fair play to have protested before. It is quite possible a mistake may have occurred. Mr. Heath thought he had bought a thorough-bred Scot; and every one with whom we have spoken upon the subject has assured us that to all appearances he is as pure-bred as any they ever saw. Yet as the breeder declares it is descended from a Shorthorn bull, his assertion, of course, must be at once received. It is right to say that Mr. Heath duly received the other prizes he gained; whereas, if he had been convicted of a wilfully false entry, he would have been disqualified altogether. The question now rests between him and the breeder; and Mr. Heath must produce the letter he received in answer to his inquiries about the age of the animal, in which reply the breeder declares he duly informed Mr. Heath of the fact that his ox was by a short-horn bull.

In the West Highland classes, Mr. Knowles was awarded the first and second prizes for oxen under four years old, and the Duke of Beaufort the first prize for oxen above that age. The animal exhibited by his Grace was certainly one of the most perfect animals we have ever seen, both in symmetry and quality: it was sold for the table of the Emperor for £45, and weighed alive sixteen cwt. and a quarter.

The principal object which the French Government had in view in inviting specimens of our breeds to their country, was avowedly to compare their quality, and

the net produce of their carcass as compared with their live weight. A strict regulation was published, binding both sellers and buyers to make it a condition of the bargain that the prize animal should be slaughtered at the abattoir Du Roule, in order that the committee of Rendement, as it is called, whose object is to ascertain the returns in meat and offal, might have every opportunity and facility for their operations. These returns will be highly important and particularly interesting, and we shall not omit, in another communication, to give to our readers a full report of those returns, as well as of those of the French prize animals of various breeds.

In the sheep classes the prize takers were Mrs. Sarah West, who gained the first prize for Cotswolds, and the prize of honour, a silver cup worth £50, for the best pen of sheep in the show. Mr. King Tombs gained the second, and Mr. John Tombs the third. In the South-down classes Lord Walsingham took the first and second prizes; and Mr. Sandbach first and second in the Cheviot. In the cross breeds Messrs. Joseph Druce first prize, King Tombs second.

In order to decide to whom the prize of honour should be awarded, by the direction of Mr. Fisher Hobbs, who acted as English judge, all the sheep were placed together, and, as we have stated, Mrs. Sarah West's Cotswold's were unanimously selected as the best. They were subsequently sold for £4 12s. a head.

The English and Scotch judges were Mr. William Torr and Mr. Harvey (N.B.) for the cattle, and Mr. Fisher Hobbs and Mr. C. Stevenson (Edinburgh) for the sheep and pigs. More conscientious judges could not have been selected; and, when we consider that, with the integrity of men of honour they possess that keen appreciation and sound judgment as to the merits of animals which a long and continuous practical experience alone can give, we cannot wonder at the satisfaction they seem to have given to all parties, and the deference with which their opinions were listened to by their numerous colleagues, even when they had to judge animals of foreign breeds.

On Wednesday, the 8th of April, the show-yard was thrown open freely to the public, and first and foremost a crowd of butchers literally invaded the stalls, and commenced probing, handling, and pinching their unconscious victims. On that day the sales of prize animals were brisk, and liberal prices freely given. In our returns hereafter we shall state the price the animal was sold at, and all the other interesting data connected with the operations of the French committee.

The Minister arrived about eleven, and, surrounded with a guard of honour, who kept the way clear from the crowd, he minutely inspected the animals exhibited, attended by the Judges, who gave him every information he desired. At one o'clock, the inspection being ended, the distribution of the prizes took place. The Market House had been decorated for that purpose, and long before the hour appointed every avail-

able seat was occupied. The Minister was accompanied by the Prefect of the department of Seine and Oise, the Mayor of Poissy, M. Lefebvre de Ste. Marie, Inspector-General of Agriculture, M. de Monny de Moiray, Chief Director of the Agricultural Department, Mr. Wm. Fisher Hobbs, and the other members of the jury. The band of the 1st Regiment of the Cuirassiers of the Guard were in attendance, and enlivened the proceedings by their performances.

M. ROULIER, the Minister, rose, and delivered an excellent address, a translation of which we shall publish hereafter. The prizes being all distributed, the Minister withdrew; and thus ended a celebration, the remembrance of which will long live in the memory of those who witnessed it, and the consequences of which can hardly be appreciated, so important are the results that are likely to be derived from this international show of fat stock.

The crisis which now exists in the meat trade, when important sources of importation have been closed, from fear of that dreadful scourge which is now inflicting such a devastation in Central Europe, invests this meeting with an additional interest. The question of food is now the question of the day, and the peaceable battle which is fought in the arena of an agricultural show is not merely a question of merit and pride between breeders, but one of a much more serious import; for on its solution greatly depends the well-being and prosperity of many communities.

Beyond a purely agricultural interest, the Poissy show evinced another very great feature, which we cannot overlook, and that was the genuine good feeling shown towards English exhibitors. At the close of the Minister's speech, by his special directions the excellent band of the 1st Regiment of Cuirassiers played the national anthem, "God save the Queen," the whole of the immense assemblage standing—a compliment to our national custom which the Minister elicited by his own example.

On the same evening an agricultural banquet reunited, in one of the rooms of M. Champeaux, in the Place de la Bourse, all the leading agricultural celebrities of the continent. This banquet was given by the writers of the "Journal d'Agriculture Pratique," and was presided over by Monsieur Gareau, who acted as a French judge at the late show at Chelmsford. On his left sat Mr. Stephenson, who had acted as a judge at the Poissy Show, and on his right that well-known friend of agriculture, Mr. Fisher Hobbs, who, in one of the happiest speeches we have heard, worthily expressed those sentiments of good-will and sympathising interest which English agriculturists sincerely feel for their French brethren struggling in the cause of agricultural progress—a progress identical with that of morals and civilization. The compliment paid to England by the worthy president was delicate and feeling in the extreme; and it is not saying too much to state that Mr. Fisher Hobbs responded to it in a manner

that reflected credit to himself, and imparted delight and enthusiasm to his audience. M. de la Trehonnais, who was also present, repeated in French what had so eloquently fallen from the lips of Mr. Hobbs in English. Those who know M. de la Trehonnais will readily conclude that he did it well, and conscientiously.

A mournful incident had, to a certain extent, marred the pleasures of this event: one of Mr. M'Combie's Scotch servants was taken ill at Poissy, and died there on Thursday morning.

It is not often that the Parisian butchers have had the opportunity of decorating their stalls with such a display of beef and mutton as they have done this week. Wreaths of laurels adorned with small, tri-coloured flags, plates bearing the description of the prize gained by the slaughtered animals, are everywhere conspicuous; and the gourmets of the fashionable restaurants never fail to order an "entre-côte" or a "filet" of the "bœuf Anglaise." One fact is certain—that, however prejudiced French graziers and butchers may be—and we have taken some trouble to ascertain their sentiments—they unanimously express their unqualified admiration of the oxen we have exhibited, and readily acknowledge not only their superiority as to symmetry and perfection of fattening, but also the excellence of the meat they have produced.

We did not fail to visit the Abattoir du Roule, where all the prize animals were taken first, to be photographed and then slaughtered, under the immediate inspection of gentlemen especially appointed by the Government to have every part of the carcase carefully weighed, and make a return according to breeds and ages of the prize beasts.

Considering the great importance which the production of meat is daily assuming, from increasing consumption and gradual rise in the price of the supply, such returns will be highly interesting.

The French minister, M. Rouher, in his excellent speech at the distribution of prizes, spoke at some length upon this subject. Knowing that a translation of that speech will be highly interesting, we condense so much of it as bears upon topics possessing importance to English agriculturists:—

"Gentlemen,—The general exhibition of fat stock for the year 1857 opens a new sphere to your studies, and points out a new aim to your efforts.

"Last year we gathered together, in the Pal of Industry, the most varied races of breeding animals; and that agricultural festival has propagated and diffused the best instruction. On this day, in this place, prepared by a municipal administration ever hospitable, we have been enabled to invite to a new celebration those whose progress we had for a long time watched from so great a distance.

"For the first time, we can subject to a comparative examination the animals prepared for the French markets, and those fattened for English consumption. This comparison will produce some information, and a useful emulation. We must, then, thank the breeders of Great Britain for their cordial readiness to respond to our invitation. They have already seen with what

admiration, free from envy, we have examined the magnificent specimens of their beautiful rages: we shall soon give them a new proof of our sympathies, with our hearty cheers when they come to receive the legitimate rewards which have been awarded them by the jury.

"Let us be permitted to think that they have also rendered justice to the spirit of our efforts, the rapidity of our progress, and the beauty of our races. . . .

"The consumption of meat in Paris, which in 1846 was 1,240,000 cwts., in 1851, 1,410,000 cwts., had risen in 1856 to 1,680,000 cwts. The period of the last five years, as compared with the five preceding years, presents an increase of consumption of 21 per cent. for Paris; and the individual consumption, allowing for the increase of population during the same periods, has risen from 136lbs. to 160lbs., that is from 16 to 17 per cent. . . .

"These statistical data are an element to re-unite to so many others, in order to quiet that uneasiness awakened by the last census, and refute the assertions, erroneous as they are, and tainted with ingratitude, of certain passionate and unjust party-men. Although certain grievous but purely accidental causes have slackened the increase of population; although the activity of our great public works has caused a displacement of labourers; although certain districts have undergone the temporary excitement of the spirit of emigration; nevertheless the movement of agricultural production has not ceased to be progressive.

"In this community, all the strength of which is put in motion, interests may experience rapid transformations, but they cannot long remain in a state of depression. If agricultural labour became more scarce, inanimate instruments would soon be substituted for animated ones. Do not already agricultural implements occupy an important place in our cultivation? Capital seems to be exclusively invested in industrial undertakings; but if public credit, which diffuses through our country so much vitality and riches, has its preferences, do not think it guilty of blind injustice. Industry, by developing the floating riches of a country, is the most powerful auxiliary of agriculture. Wherever capital becomes abundant, it is not long before it seeks, by its incorporation with the land, the best conditions of stability. It is capital which will stop in our country the excessive parcelling out of the soil, and will gradually, and in a useful measure, reconstitute large properties. Look to England, and see all that which the prodigious prosperity of her industry has enabled her to do for the prosperity of her agriculture. Look nearer to us: are not the most perfect cultures to be seen in the immediate vicinity of great industrial centres of population?

"The mission of the government placed at the head of that prosperous nation, has been defined with one word by the Chief of the State, 'Enlighten and direct; behold its duty,' said the Emperor. Thus it has appeared useful to the Government to judge the different methods, not only by their produce, but still by inquiring what care, skill, and expense they have required.

"Expensive successes would never succeed in promoting abundance. It is then necessary to examine the

operations from their beginning, and in all their details, to know thoroughly the means employed, to open at last a grand inquest about the most commendable agricultural undertakings. I have endeavoured to achieve this by granting important premiums to those agriculturists who have distinguished themselves by their success.

"A large production is, no doubt, the first cause of cheapness; but it is not the only one. The facility of transport might also concur in it. A bad commercial system might render it impossible. These considerations have brought me to submit to a new study the questions relative to meat taxation, and to the organization of the Paris meat trade, about which I spoke to you last year. The Council of State are deliberating upon the question. They will weigh the advantages and inconveniences of liberty—the advantages and inconveniences of restriction: they will examine all the systems in their full independence, without any preconceived idea—without any arbitrary theory—in aiding themselves with the data of experience, and the facts established by time. They will allow for the diverse, but not contradictory, interests of the breeders, intermediaries, and consumers, and will prepare the most prudent solutions with the profound sagacity that presides over their deliberations.

"By prescribing these investigations, the Government of the Emperor has only one aim, which is also yours, because it is that of all good citizens—to prevent or alleviate sufferings—to insure to all intelligent labourers and honest men that comfort which they would demand in vain from barren agitations, but which they must obtain by labour and honesty.

"This end shall be attained, gentlemen, be certain of it. The chief of the State has placed your interests under the direct protection of his vigilance and his genius, when he said at the opening of the last Legislative Session, 'The progress of agriculture must be one of the objects of our constant solicitude, for its progress or decline determines the prosperity or the fall of empires.'"

We have thus given at some length this remarkable speech, because it will remain as a test and a declaration of principles, the sincerity of which will be further tried in futurity. We say *futurity* advisedly, for the present state of things is in direct opposition with all these high-flown declarations. French agriculture, incited by our example, is making the noblest efforts to emancipate herself from the trammels of routine and ignorance. During our stay here we have visited farms which, by their excellent management, would do honour to the best of our agricultural districts, and leave far behind the average skill of some farmers. But would anyone believe, after speeches of the Emperor and his ministers, that the greatest obstacles to agricultural progress come from the Government themselves? No one in England can have a conception of the vexatious obstacles which beset an agriculturist who wishes to avail himself of the means which science, by its precious discoveries, puts at his disposal. We all know that salt, for instance, has become one of the most important auxiliaries of good farming. We lately advised a French agriculturist, who complained to us that

he lost full one-third of his cereal crops yearly by the lodging of his corn, to use salt, assuring him that it was a never-failing remedy; but the difficulties to obtain the quantity he wants from a monopolizing Government are such that he must either give it up altogether, or else buy it at the Government price, fixed by a monopoly, which would be ruinous. We advised another to try superphosphate mixed with salt for his mangolds. The superphosphate was sent from England, but stopped at the Custom House on its arrival at Havre, and notwithstanding the most strenuous efforts to obtain its free admission, it is still in the clutches of the officials, where it is likely to remain until it goes back to England. The same gentleman applied also for salt; but owing to similar vexatious and senseless formalities, he had been obliged to give it up in despair. Our readers are aware, besides, at what difficulties and expense English implements are admitted into France. Let our readers add to all these drawbacks the heavy duty on iron, which keeps up the price of the material so extensively used in agriculture almost to that of a luxury, and they will come with us to the conclusion that before we can give credit to the French Government for the sincerity of their good intentions, so grandiloquently expressed, we must witness a complete reversal of the policy of their fiscal laws and regulations concerning the raw materials of agricultural production.

We omitted in our report to mention an interesting feature of the banquet which took place after the show. On the right of M. Barral sat a Russian gentleman, the owner of the very ground upon which the allied armies pitched their tents and unfurled their glorious banners before Sebastopol. The gory fields where Inkermann, Balaklava, and Traskir were fought, the bloodstained trenches where so many of our countrymen found a shroudless grave, and the mournful enclosure on Cathcart hill, beneath the surface of which so many heroes sleep the sleep of death, are his. His numerous herds and flocks are now peaceably grazing the green turf which Nature, heedless of men's strife, silently lays over the ruins now restored to peace and solitude.

## CATTLE-BREEDING IN FRANCE AND ENGLAND.

(From the *Siccle*.)

In both countries an equal number of sheep is bred; this number is about 35,000,000 head. The 35,000,000 in the United Kingdom live on 31,000,000 hectares (2½ acres), while the 35,000,000 in France live on 53,000,000 hectares. It therefore results that on an equal extent of territory the English breed two sheep where we only breed one. This is not the sole difference. In many of our departments the production of fine wool has been encouraged to the detriment of the production of meat. The English have sent their fine merinos to Australia, where they prosper admirably, and their whole attention is devoted to the production of meat. It thence results that the 35,000,000 French sheep produce annually 60,000,000 kilogrammes (2 lbs.) of wool, and 144,000,000 kilogrammes of meat; while the 35,000,000 English sheep produce



annually 60,000,000 kilogrammes of wool, and 360,000,000 kilogrammes of meat. The proportion of mutton produced in France and England exists in the very disproportionate figures of 144 to 360. And in these figures we have compared France with the British isles, thus comprising the hilly regions and moors of Scotland, as, likewise, the poorer districts of Ireland. Were we to confine ourselves to England proper, the contrast would be even greater. England breeds two sheep per hectare against two-thirds of a sheep bred by France; the produce of an English sheep is more than double that of a French one. So much for the ovine race. In England the consumption of milk is considerable, and cheese forms an important article of food. The county of Cheshire alone supplies cheese of the annual value of £1,000,000 sterling. Milk is sold dearer in England than in France. Our cows produce 1,000,000,000 litres of milk, which is sold at an average price of 10 cents, the litre; the English cows produce double the quantity, which is sold at double the price—consequently the English agriculturists derive a profit four times larger than the French farmers. The English breed 8,000,000 head of cattle on 31,000,000 hectares; the French breed 10,000,000 on 53,000,000 hectares. Therefore the English, on an equal surface given, possess more cattle than the French. The butchers' trade of France slaughters annually 4,000,000 head of cattle, which produce 500,000,000 kilogrammes (2lbs.) of meat. The English slaughter annually 2,000,000 head, and yet obtain above a quarter more meat than the French. Whence proceeds this immense difference? In England very little veal is eaten; it is not considered as meat in proper condition to be slaughtered, and the farmers are aware that in killing a calf a source of capital is destroyed. In France, out of 4,000,000 head of cattle slaughtered, calves figure for 2,500,000. Veal is a poor article of food, but we do not possess sufficient forage to allow our calves to reach their maturity. In England oxen never work in the fields, and they attain considerable fatness. In France cattle are slaughtered after several years' labour; they are fatigued, exhausted, and afford relatively a scanty supply of meat. It will be said that our cattle give in labour what they lose in flesh, but the compensation is not equal, as the following table shows:

French cattle give annually—	
In milk .. .. .	100,000,000 f.
In meat .. .. .	400,000,000
In labour .. .. .	200,000,000
<b>Total .. .. .</b>	<b>700,000,000 f.</b>
The cattle of England give each year—	
In milk .. .. .	400,000,000
In meat .. .. .	500,000,000
In labour .. .. .	.. .. .
<b>Total .. .. .</b>	<b>900,000,000 f.</b>

A cow in England produces, therefore, more by its milk and meat than the same animal in France by its milk, meat, and labour.

**SALTING-IN GRASS—COPROLITE—HAIR AND BLOOD MANURE.**

1. SALTING-IN GRASS.—How far the Prussian method, given in your last, may answer in this country, in competition with hay, may be best ascertained by doing it in wet or precarious seasons, when the hay might be in danger; thus saving it from spoiling, and enabling the grazier to compare its feeding power with that of a like crop made into hay—so profiting by Prussian experience to guide us in an experiment likely to be of considerable importance in our capricious climate.

2. COPROLITE.—In reply to "A. G.," respecting copro-

lite, it is worth, according to the prices of manures in your paper, £3 15s. to £4 10s. per ton. It is largely found in England, consists of impure phosphate of lime, and thus forms a substitute for bone, both in dressing pasture and turnips, and making superphosphate; but for the latter purpose consumes much sulphuric acid, and for dressing turnips or permanent pasture needs to be thoroughly crushed, as it is hard and insoluble. It may be made more tender by heating just dull red in a kiln, or heap, and quenching suddenly in cold water. The manure dealers understand the management of it; but perhaps the best way the farmer can use it is, when crushed in compost with roots, weeds, and other vegetable matters, with salt enough to kill the roots, seeds, and vermin: the acid generated in such a compost will help the solubility of the coprolite. But dung or lime must not enter into the compost, as their alkaline tendency would go to neutralize the acid.

3. BLOOD AND HAIR AS A MANURE.—The inquiries about blood and hair are three weeks old; but having not been answered since, I take the same opportunity. Blood is a powerful nitrogenous manure, containing three per cent. of nitrogen. Its use is well understood by the manure makers, one firm of which, in London, consumes 2,500 gallons per day. In Northamptonshire, the farmers compost it with peat ashes and charcoal powder, about 8 bushels to 50 gallons blood for turnips and young wheat; for turnips 48 bushels an acre (or 16 bushels, with dung); for top dressing young wheat 20 to 30 bushels an acre. They keep the compost a year or two (Johnston); but five or six months would probably answer, if turned well up once a month, or oftener.

Hair is about the richest material in nitrogen that we possess, containing, when dry and clean, 16 per cent. (more than the best Peruvian guano); but when damp and dirty, the nitrogen must be, of course, proportionately less, perhaps not half in the state of feldmonger's refuse. From its difficulty of decomposition, however, its fertilizing action is slow, unless the solubility be promoted by other agents. There is a patent for reducing it with sulphuric acid; but the farmer may probably use it best by working well in a hot compost of dung and urine, with a vegetable absorbent of dead leaves, tan, bark-refuse, or peat earth, to retain the ammonia. The other "tanner's refuse" included in the same inquiry, if of animal matter, may be chopped up and treated like the hair, if hard and horny; or if soft, mixed in the yard-dung heap; the bark refuse is of little value, except for working nitrogenous matters and retaining the ammonia. J. PRIDEAUX.

JOHN TOWERS, ESQ.—On Saturday, April 11, at his house at Croydon, at the good old age of 79, died John Towers. In him the agriculturists of England lost one of their oldest and most indefatigable writers. For a long series of years he had been a contributor to the *Quarterly Journal of Edinburgh the Farmer's Magazine*, and *Mark Lane Express*. He laboured almost to the last for the acquisition of knowledge with all the buoyancy of his earlier years. His industry in advocating, and assisting in the application of science to agriculture, his long pilgrimages amid the Surrey hills, his useful meteorological records, marked this thirst of knowledge. If our readers could have seen him in his well-stored library carrying on his scientific manipulations, and recording the result of his observations, at a time when he was nearly fourscore years of age, they would have felt with us that the farmers never had a more zealous or untiring friend than the late John Towers.

## THE ACREAGE DUTY ON HOPS.

## PUBLIC MEETING AT TUNBRIDGE.

On Tuesday, April 14th, a meeting of the hop planters resident in Tunbridge and its neighbourhood, was held at the Town Hall, "for the purpose of taking into consideration the propriety of petitioning the Chancellor of the Exchequer for an acreage duty, in lieu of the present excise duty."

There was a very large attendance, and considerable interest appeared to be taken in the proceedings. The Rev. W. M. S. Marriott, rector of Horsmonden, presided; and among those present were the Rev. G. S. Woodgate, Messrs. Carneli, S. Monckton, J. Waite, Ashby, J. M. Luck, Tompsett, Johnson, Cox, Twort, Thirkell, Waterhouse, J. Holmden, Ansten, Cronk, Wilfear, Wheeler, Chatfield, Fagg, Ranger, Masters, H. Simes, Children, H. Edwards, Wightwick, Harris, T. Parker, Skinner, Phillips, Spencer, Maplesden, &c., &c.

The Rev. CHAIRMAN, in commencing the proceedings, said, when several gentlemen called on him the other day at Horsmonden, and requested that he would preside on the present occasion, he informed them that he should be most happy to do so. He had stated to them his own opinions upon the subject, and he had been informed that this meeting was to be called with a view of seeing whether some agreement might not be entered into, to which the hop planters might assent, so that the case might be brought before the Chancellor of the Exchequer with some hope of a satisfactory settlement of the matter. They would excuse his presumption in appearing there as chairman of that meeting, as he was not at present a hop planter himself, although at the time of the alteration of the corn laws, when a number of farmers were thrown out of occupation, he then, for some time, had experience as to what the difficulties and anxieties of a hop planter were (Hear, hear). Though not now a hop planter, yet as a landlord in this county, he was as much interested in and identified with the question as any hop planter might be. He thought it would, perhaps, be right for him to state, at the outset, his own opinions upon this subject, as chairman of the meeting. He had always, in considering this subject, felt it would be a matter of very great loss to the hop planters generally if the customs duty were abolished (Hear). He was aware that there were persons who would be willing to sacrifice the customs duty, provided they could get a general repeal of the hop duty, and so have free-trade in hops; and every man certainly had a right to entertain whatever opinions he chose on these matters. But in his humble opinion, if such a resolution were come to, it would prove most detrimental to the interests of the hop planters (Hear). He was of opinion that they would then be exposed not merely to competition from abroad, but to competition from many parts of this country where hops had been hitherto grown only to a limited extent. He believed if a total repeal of the hop duty were effected, they would be exposed to two great difficulties. They would not merely have the option of falling into Scylla in order to avoid Charybdis, but as the Irishman said, they would fall into Scylla and Charybdis at the same time (Hear, hear, and laughter). There was another question connected with this; he alluded to the duty upon hops. He had long felt that they were labouring under a most grievous and intolerable injustice. They had been, as hop planters,

paying for the past forty years a war duty in the time of peace (Hear, hear). While other classes were enjoying the advantages and blessings resulting from peace, the hop planters were unable to say "Peace, peace;" there was no peace while they were obliged to pay a war duty (Hear, hear). It had been said by his (the chairman's) worthy and excellent friend, Mr. Masters Smith, whose absence from the House of Commons was a subject of great regret, not for his own sake, but for the sake of the hop planters, whose interests he (Mr. Smith) had watched over with the greatest possible anxiety and vigilance; and he (the chairman) was afraid Mr. Smith's absence would be much felt in that respect in the forthcoming parliament. It had been said by him, that, upon a late occasion, when he went into the same lobby with the Chancellor of Exchequer, he took the opportunity of pressing upon that hon. gentleman the claims of the hop planters; and in the course of conversation, Mr. Smith pressed upon the Chancellor's attention the war duty on hops, and the propriety of its abolition. The answer of the Chancellor of the Exchequer was that he was not then contemplating taking off the duties of a former war, but merely those imposed during the late war in which we were engaged. He (the chairman) thought a more unjust answer could not possibly have been given, as if the length of time during which an injustice had been inflicted made it at all more bearable! The rev. Chairman next spoke of the acreage duty, which came upon them with some peculiar claims, supported and encouraged by a gentleman for whom they all entertained the highest respect—he meant Mr. Thomas Law Hodges (cheers). Mr. Hodges had now advanced to a late period of life, and, of course, the infirmities of life came with length of years. Notwithstanding this, however, his mind was as energetic and active as ever; and whenever the subject of the hop duties was discussed, he (Mr. Hodges) was like an old war-horse, when he hears the war trumpet (cheers). Mr. Hodges had been recently engaged on a bill, which had been drawn up with great care, and of which he (the chairman) had seen a draught. With regard to the customs duty he proposed to diminish that duty from £2 5s. to £1 5s., and he further proposed that foreign hops should pay an immediate duty upon coming to this country, and that they should not be bonded at all. It had been said that it was impossible for the hop planters to agree on the subjects more immediately interesting them; but he (the chairman) hoped and trusted, as it was in no way a party question, that every one would admit a little on the one hand, and permit a little on the other, so that some resolution might be come to, which would have the effect of taking away from the Chancellor of the Exchequer, and from those who might succeed him, the excuse they had hitherto made, that they would do something for the hop planters when they had agreed together among themselves (Hear). Let them, upon questions concerning their interests quote the poet who said—

"Our doubts are traitors, and make us often lose  
The good we'd have by fearing to attempt" (cheers).

The Rev. Mr. WOODGATE proposed a resolution to the effect that this meeting was of opinion that it would be con-

ducive to the interests of the hop planters to petition the Chancellor of the Exchequer to have an acreage duty of £3 in lieu of the present excise duty. He was not at all surprised to see so large a number of hop planters present to-day, as they must all feel that they were placed in a most unfair position (Hear). He thought, when they recollected the past two years, and the duty they had had to pay upon their crops during that period, they must feel that it was quite time that men of all political opinions should combine to carry out the object they had in view (Hear, hear). He thought that the prospects of the British farmer were extremely gloomy and discouraging; that now the war was over there would be large importations of corn from Russia, from the provinces of the Danube, and from other sources. The rev. gentleman next glanced at the facility with which corn and other commodities might now be transported from one country to another in consequence of the rapid extension of railways, and went on to remark that it well became them to consider how these difficulties in prospect might be met practically (Hear.) There were two modes of meeting this question—one of them popular in Mid Kent—that they should do away with the war duty of 5 per cent.; but he (Mr. Woodgate) was of opinion that no such thing as a war duty existed, as he considered that Sir Robert Peel, when he revised the excise and customs duties anew, in connexion with his free-trade tariff, had been under the impression that he had set the matter at rest for ever by assigning a customs duty of £3 5s., and leaving the excise duty where it was previously. One mode was the substitution of an acreage duty of £3, in lieu of the excise duty which was now being paid. He (Mr. Woodgate) hoped that the Kent and Sussex planters would know their interests sufficiently to be of opinion that if they could gain this point from the Chancellor of the Exchequer, it would meet their difficulties, and enable them to persevere in the cultivation of hops. He thought it was right to mention to them that Mr. Hodges had been preparing a bill, in which he proposed that there should be an acreage duty of £3, and he further proposed that the customs duty should be reduced from £2 5s. to £1 5s. If that proposition were carried, were they prepared to say that that would be equivalent to their expectations and wishes (No, no.) Clearly not. Then, the last proposal which existed, if they sought an acreage duty, either of £3 or any other sum, and it was not granted to them, would be free-trade in hops; he did not see how they could meet the case otherwise. He did not see how they could go on with the cultivation of hops if there were no alleviation in the duty which was now paid. It would then become a question with the Kent and Sussex planters to say whether they were prepared for free trade or otherwise, or whether they could grow hops in the present state of things at a commensurate profit. Mr. Woodgate concluded by again reading the resolution; and remarked with regard to the reduction of the customs duty, proposed by Mr. Hodges, that they did not meet at all to entertain or discuss that question.

Mr. CHILDREN seconded the resolution, and expressed a hope that the hop-planters, and all those interested in the cultivation of hops, would be unanimous on the subject.

Mr. MEADES opposed the proposition with some warmth, remarking that they grew in Tunbridge parish double the quantity of hops per acre that they could do in his locality [As we understood, in Sussex]. It would be most unfair that they should be called upon to pay the same duty as such districts as Riverhead, Sevenoaks, Maidstone, Cranbrook, the Weald of Kent, &c. He would rather submit to a further imposition of 10s. more on the duty than endorse an acreage duty of £3.

Mr. THIRKELL combated Mr. Meades's views on the subject; and remarked that he cultivated hops in several different parishes in Kent, and he was satisfied that the largest crops of hops could be grown on the poorest land. He then contrasted the produce on some comparatively rich land, for which he paid £6 per acre, and some poor land, for which he paid 15s. per acre—land which some persons would not have taken at all; and he found that the greatest crops were grown on the poorest land, as the subsoil was brick-earth, and it grew the largest crops. Mr. Thirkell also said they had been paying a war-duty for 35 years, through being divided, as it appeared they were now. If they would not give a long pull and a strong pull together—if private interests could not be waived—the truth was, that they would still have to endure the same impost as they had hitherto done (Hear, hear). With regard to the customs duty, and a due protection of their interests, Mr. Thirkell said the hop-planters were not in a position to compete in our markets with foreigners, and that the hops of the latter were worth considerably more than the English. If they allowed the foreigner to come in free, the hop-planters of this country would have to grub up their plantations. If the hop-planters could get an acreage-duty of £3, and the Chancellor of the Exchequer would allow the £2 5s. customs duty to remain, it would conduce to their interests (Hear, hear).

Dr. S. MONCKTON, of Brenchley, said it seemed to him that the agitation, which had now been carried on for a long period of time, had never yet had given to it a preliminary and distinct statement of the object to be attained. It appeared to him that the first resolution they should adopt ought to embody a distinct—and it ought to be a unanimous—opinion, on the part of the meeting, that the excise duty upon hops, as now levied, was oppressive in its amount, and unequal in its pressure. If they could get the meeting to carry unanimously that proposition, there would be one point gained—one point so far as it regarded unanimity, at all events. Dr. Monckton then proceeded to descend, at some length, on the inequality and pressure of the tax, and then went on to suggest a resolution, to the effect he had mentioned. Then came the second question, how could these two points be remedied? There were three remedies as old as Adam. The first was free trade—the abolition of both duties—which was the point aimed at, of course, by those who were perpetually, day and night, looking through the green spectacles of free trade; for there were some who could only see an absolute remedy for anything of this description by the adoption of free trade (Hear, hear). But if they had free trade in hops, they were done. It was said to him below-stairs, about five minutes ago, "Was not the same prediction made with respect to free trade in corn? and had not that been stultified?" It had, so far; but let them wait for two years longer, and then see whether these predictions had been stultified or otherwise. If they had free trade, they would extend their cultivation at home, as a large number of acres would then be planted which it was not now worth while to cultivate; and so they would increase home competition. But, although he did not wish particularly to broach that exclusive principle with reference to our own home competition, how did the foreign market stand? Many of them knew—and knew it smartly, too—that they had active competitors to deal with there. He would ask of them, what would become of British capital—that large capital which was now in the hands of men whose interests led them directly into cheap markets and low prices for hops? Dr. Monckton went on to say that hops would be introduced in unlimited quantities from the fertile plains of Bohemia, the provinces of France,

&c., and inquired what would then become of the British hop-planters? At this moment, he (Dr. Monckton) had a ton of Joyne's hops in France. They had been there for the past three months, in the hands of personal friends; and he could not get 45 francs for them: At this moment, English hops were worth only 45 francs per cwt. in France; and if they had free trade in hops, it would settle the English hop-planters. If they must have free trade in hops, for goodness' sake, let them not seek it themselves; and he thought, if it were adopted, he should go home and grub up his hops. Then, again, the next remedy was the reduction of the war-duty. There was a strong section of persons interested in the production of hops, who went about agitating for the remission of the war-duty upon hops. But there were two important things to recollect. As Mr. Woodgate had very properly said, there was no war-duty; and in asking for its remission, they perpetuated one grievance—namely, the inequality of pressure—perpetuating the expense of its collection. Commending the £3 acreage duty to their notice, as worthy of their most serious consideration, as the third remedy, and remarking that it would particularly benefit the Sussex planters, Dr. Monckton said that the duty should be paid from the first day that they planted until they grubbed.

The CHAIRMAN observed that the bill of Mr. Hodges proposed that nothing should be paid the first year, half the duty the second year, and then £3.

Dr. MONCKTON was sorry to differ with the bill brought forward by Mr. Hodges, and referred to the proposed reduction of the customs duty, which he did not approve of, and to which he did not believe the hop planters would assent; it was a most dangerous thing, opening the market to intruding foreigners, while English capital was sent abroad. One point too was of peculiar difficulty, as proposed by Mr. Hodges, introducing speciality into the case, with reference to bonding foreign hops. Tea, wine, &c., were bonded, and it would be asked why should any special favour be made in behalf of the English hop planters. All they wanted was that their payments should be commuted to £3 per acre, and that the customs duty should remain unchanged.

Mr. THIRKELL: That is retaining it at £2 5s.

Dr. MONCKTON replied in the affirmative, and expressed his regret at feeling it his duty to introduce sentiments of difference in his remarks, but said he was desirous of having the questions at present agitating hop planters settled.

Mr. NASH, of Rochester, as a grower of hops for many years, said he had long felt that the hop planters were suffering, and to a heavy extent, from the duty imposed upon them by growing hops. He also felt that they should be unanimous upon some point or other, and expressed the disappointment, he felt at the failure of an attempt to make an arrangement on the subject affecting their interests, at Maidstone, two years ago. He (Mr. Nash) was of opinion that a total remission of duty would be beneficial to the grower, and he had thought it his duty in all the votes he had given to candidates desiring to represent them in parliament, to press the matter upon their attention; and he was happy to inform the meeting that at Brentford, Mr. Hanbury pledged himself to vote for a total repeal of the hop duty; and Lord Robert Grosvenor had also stated that he was perfectly sure that an alteration ought to be made, but he was not then quite prepared to say what that alteration ought to be. He (Mr. Nash) would not oppose an acreage duty if they could get it; but if there was the least intimation from the Chancellor of the Exchequer that they were to have the customs duty taken off, he (Mr. Nash) would then say—go the whole hog, and never rest satisfied until they got every fraction of that duty repealed.

Mr. THIRKELL said he would rather have a double excise duty put on than that which Mr. Nash advocated should be carried into effect.

Mr. MONCKTON also made a remark to the same effect.

Mr. NASH observed that although they had lost their friend, Mr. Masters Smith, he believed that the two members for Middlesex and the members for Kent would be able to fill his place, and that they would see that justice was done to the hop planters. Mr. Nash next spoke of the hop planters as employing a large amount of surplus labour, and referred to the payment of great and small tithes, which he condemned; concluding by expressing a hope that they would be unanimous in their decision as to the £3 acreage duty, although in doing so he sacrificed his own feelings; if they could not do so, he should advocate free-trade.

Mr. THIRKELL was at a loss to conceive how they could be placed in a better position to compete with the foreigner by taking off the duty.

Mr. MARSH denied that foreign hops were preferred by the brewers to English, but said that a system of deception was carried on by which large quantities of hops, of an inferior description, were written down as "Choice Goldings," and palmed off on the brewers, of which they were beginning to be sensible. They did not like foreign hops, and would not touch those from America, while they turned up their noses at the hops from Belgium. But they had occasionally resorted to foreign markets for this reason: When the English growers had a quantity of hops, they would not take a fair price for them, and thus drove these men to a foreign market. Thousands of pockets were offered at a long price—£23 or £24 per pocket, which they were ultimately obliged to sell for £14, and serve them right too. They (the hop planters) had driven the brewers to look out for hops in other places, because they would not grow the proper quality, or when they grew quality, they would not sell them at a fair price.

Mr. THIRKELL said the fault was to be ascribed to the merchants, who endeavoured to depreciate the hops they received, when in London, and then sent them to Manchester, Liverpool, and elsewhere, and sold them as choice Goldings, Colgates, &c.

The CHAIRMAN then put the resolution, as proposed by the Rev. Mr. Woodgate, and seconded by Mr. Children.

Mr. HENRY EDWARDS supported the proposition, and said that he hoped it would be carried unanimously, as well as adopted throughout Kent and Surrey, and all other counties where hops were grown.

The resolution was then put and carried *nem. con.*

Mr. EDWARDS proposed, and Mr. THIRKELL seconded a resolution to the effect that committees should be formed in the several hop-growing districts for the purpose of carrying the first resolution into effect; which was adopted, and a committee appointed for the Tunbridge district.

On the motion of Mr. NASH, a vote of thanks was unanimously accorded to the Chairman, who, in returning thanks, said he wished to say one word with respect to a remark which had fallen from Dr. Monckton with regard to their being exposed to home-competition. He (the Chairman) did not wish to see hops grown in other counties which hitherto had not grown them, and which would be the case, if free trade in hops were adopted, as a large population was at present supported in the hop districts, who would be materially affected if hops were grown in other districts where they were not now cultivated.

The proceedings then terminated.

## THE CHOICE AND UTILITY OF AGRICULTURAL IMPLEMENTS SUITABLE FOR TILLAGE AND STOCK FARMS.

At a recent meeting of the Bakewell Farmers' Club, at Bakewell, Mr. B. Swaffield in the chair, at which Lord Denman and other influential members were present, Mr. Lawrence Furniss, one of the most successful and enterprising farmers in North Derbyshire, read the following paper "On the choice and utility of agricultural implements—the description most suitable for tillage and stock farms."

Mr. FURNISS, after a few preliminary remarks, proceeded: I am sure you will agree with me that the subject under consideration is of considerable importance to the farmer. A good stock of implements, the best of their kind, is not only essential to good cultivation, but for economizing labour, for which reason I hold that it is as important for the farmer thus to provide himself with farm machinery, as to stock his farm with cattle and sheep. During the last ten years, great improvements have been effected in the construction of farm implements, which has been chiefly owing to the annual exhibitions of the Royal Agricultural Society of England, with other societies of a kindred nature, presenting the opportunity of comparison, and of seeing them tried in their respective classes. The result of these comparisons and trials, with the suggestive improvements by scientific manufacturers, is, that farm machinery has arrived at such a high degree of perfection, that the farmer in making a judicious selection—that is, in purchasing the implements from the most scientific and practical manufacturers—will rarely have to complain of disappointment. Gentlemen, I shall now proceed to introduce to your notice what I conceive to be the most economical and effective implements on the farm. I advocate iron-wheel ploughs, for various reasons—durability, the little skill required on the part of the ploughman, the ease and regularity with which the horses work the plough, the uniformity of depth and width of the furrow slice, the great annual saving at the smith's shop and of labour in carrying the irons to and from the farm. I find by reference to blacksmiths' bills the annual expense in repairs on wood ploughs to be from 35s. to 40s.; on iron ploughs having the same amount of wear, not more than 10s. On lands unsuitable for wheel ploughs, substitute the iron swing plough. I recommend the use of iron harrows in preference to the old-fashioned wood harrows; there is no comparison for durability, efficiency, and dispatch. One operation with the best-constructed iron harrow, each time cutting a separate track, will be equal to two or three of the wood harrows. When worn out, they can be sold for old iron. The corn drill is a most valuable implement for depositing the various sorts of grain; the result of the use of the drill will be saving of seed to the amount of from 4 to 6 pecks per acre; the seed being sown at one uniform depth, and at any width between the drills you may desire, gives an opportunity of hoeing betwixt the rows, which is of great service in destroying weeds and in promoting the growth of the crop. There will be some advantage, too, in the crop arriving earlier at maturity, and being more kindly ripe. For cleaning or fallowing the land, in addition to ploughs and harrows, the farmer should possess himself of a drag, which can be used as a stubble parer, as well as breaking up the

turnip lands for sowing. One deep ploughing in the autumn in connexion with this implement, will be sufficient for the fallowing process. The size of the drag to be in proportion to the number of horses on the farm; the larger the drag, the more effective is its operation. Drag harrows should be had for fallowing; they are heavier than seed harrows, fewer and longer teeth passing through the rough clods without sledging, penetrating to the bottom of the loosened earth. These two implements will bring up the rubbish on to the surface, exposing as much as possible the soil to the influence of the sun and air. In order that this important operation of the farm may be effective—that of thoroughly cleaning the land—a clod crusher must be had; for, unless you pulverize and break down the clods, you cannot rely on destroying the couch grass and small seeds of weeds, and except these seeds are exposed to atmospheric influences and made to vegetate, you cannot annihilate them. I would abandon the old-fashioned stone roller, and substitute in its place the metal roller, of suitable width and weight. The advantages of this change will be despatch; one man and two horses will get over sixteen acres per day, it is less liable to breakage, and of great durability. Two kinds of turnip drills are made—one for ridge work, the other for flat. These drills should be of a character to sow the seed and manure at one operation. I am decidedly in favour of the ridge system. You have greater facilities for horse hoeing, a most important operation, promoting the growth of the plant, destroying weeds, diminishing labour in thinning and hoeing, and producing a heavier crop. Sowing turnips on the flat may have some advantage where the turnips are to be eaten off the land by sheep, as they probably will stand the winter better, being more thoroughly imbedded in the soil, the result of their being of smaller size and on the flat. The grass seed drill—a simple, inexpensive implement—is of great value to the farmer. By the use of this drill, the seed will be sown with the utmost regularity, much less seed will be required, and one man will get over 18 acres per day. Barn machinery is of too much importance to be overlooked. On farms where one hundred acres of corn are grown, steam should be employed for thrashing, chaff cutting, cake breaking, preparing or cooking food for cattle, &c. Where a smaller breadth of corn is grown, it is questionable whether the farmer would be warranted in going to the expense of a steam engine. Probably the interest of the money would be greater than the advantages, consequently horse power must be had recourse to. In selecting a thrashing machine, make choice of one that will not shell or injure the grain, and one that will bring out the straw as straight as if it had been thrashed by the flail. The bolting thrashers possess this advantage over the open drum machines. Great economy in labour will be the result of thrashing by power, besides enabling you to sell at a greater advantage. Certain machinery is required in preparing the corn for market—a winnowing machine and blower. If these implements are of the right sort and skilfully worked, your corn factor will not complain of bad dressing when your grain goes to market. The chaff cutter is an instrument of great utility, if of the right sort; worked by power, any quantity of hay or straw may be cut. The

root grater is a newly-invented implement, and one of great promise, to be used in connexion with the chaff cutter. The grated roots amalgamated with the chaff, allow it to ferment to a certain extent, before being given to the cattle, sheep, and horses. I need not expatiate on the utility resulting from the best-constructed turnip cutters; they are absolutely essential in the proper feeding of cattle and sheep. On grass or dairy farms, the hay-maker is a desirable implement. This machine has been brought to such a high degree of perfection, as almost to be pronounced perfect. One of these implements, in connection with the horse rake, will, in the hay field, supersede manual labour to a considerable extent. The hay-maker can only, with propriety, be used on old meadow lands; the shaking would be too severe on the artificial grasses in thrashing out the seed. I am a decided advocate for one-horse carts for all purposes on the farm. They are to be obtained at the least cost. Fewer horses will be required to get in the harvest than if

waggons were employed; less labour in driving, loading, &c., and greater despatch and conveniency. Considerable improvement has been effected in the construction and manufacture of the smaller implements of the farm, such as drag rakes, forks of various sorts, scythes, spades, shovels, edge tools, &c. Here the farmer will find it to be greatly to his advantage to be very choice in his selection. A farm labourer, with a neat handy tool, will perform much more labour and with greater ease. Gentlemen, I have now briefly referred to some of the most important implements employed on the farm. I desire, in conclusion, again to urge the necessity of the farmer being exceedingly cautious in making his selection, always purchasing the most effective implements, which are only to be had of the most scientific and experienced makers.

At the conclusion, Mr. Furniss was complimented by the members, and a vote of thanks was passed unanimously.

## CALENDAR OF AGRICULTURE.

Horse and hand-hoe all drilled crops: allow not a single weed to be seen.

Turn over the heaps of winter-prepared dung ten days before being used, in order to promote the fermentation. Shake all the materials loosely together, and place the outside pieces of the heap into the inside of the newly-formed mass. Plant beet-root early in the month, and Swedish turnips by the middle of May; open drills at 28 inches apart, spread the warm dung from the heaps along the intervals, reverse the drills, and sow the seeds immediately in the fresh tilth of soil, and over the fermenting dung. Roll the drills with a light weight, unless the weather be damp and moist.

During the month plant cabbages, kohlrabi, savoys, and winter broccoli, from the seed beds, in drills three feet apart, and the plants two feet asunder along the drills. Apply very wet farm-yard dung in an ample allowance on stiff lands that are too clayey for turnips, and dibble the plants during the wettest weather in which work can be performed, as the plants require much moisture.

Fill all blanks with fresh plants, in order to produce an even crop. Sow early turnips for an early crop, as tankards and whites, and sow rape to be consumed on the ground, as preparatory for wheat.

Pare and burn rough lands, and spread the ashes to cool before sowing the seeds of turnips. Prepare without intermission the fallows for green crops, and also clay fallows for wheat.

Stall-fed cattle will now be sold away; the fat ones to the butcher, and the unfinished animals will be sent to the pasture fields to be fattened on grass. The milch cows go to a pasture field of permanent grass, adjacent and convenient to the homestead, provided with water and shelter, and improved, if the quality be inferior, by frequent top-

dressings and sowing of clovers and strong perennial grasses. The oldest calves may go to the grass paddock, and if the herbage be scanty, an assistance must be given in vetches placed in racks. A shelter-shed and a supply of fresh water are indispensable.

The latest lambs will now require much attention, and the best grass on the farm, in order to raise them on an equality with the foremost. The good management of animals is most clearly shown in an equality of breeding and condition.

The ewes and lambs that are consuming on the ground the early vetches and rye, must have fresh food every two days. Begin the soiling of horses and cattle in the yards, and the milch cows also, if the pasture is not sufficient. Feed the store pigs with vetches, and supply ample littering to all animals. As the early soiling green crops are consumed, plough the lands to be sown with turnips drilled with ordinary manures.

Put mares to the stallions, and geld colts, though the latter operation may be better performed in the previous autumn.

Finish the sowing of grass seeds on barley tilths. Sow by machine, and cover by light harrowing and heavy rolling.

Dig hop plantations, and tie the bine to the poles. Shut up watered meadows for hay.

Wash sheep by hand in a clear running stream; and to prevent the maggot-fly, sprinkle the animal from head to tail from a dredging-box, with a mixture of hellebore-root powder and of black brimstone,  $\frac{1}{4}$  lb. to  $1\frac{1}{2}$  lb.

Weed young quicksets, but not to expose the roots in dry situations to scorching suns. Rather leave the weeds, to retain moisture, provided the upward growth be not checked.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR APRIL.

Notwithstanding that the weather has been very changeable and cold for the time of year, vegetation has made some progress during the month; still the season may be termed a backward one, and not very favourable to the crops, which in some parts of England are looking far from healthy. There are, however, no serious complaints to be made on this head, and no doubt the return of more genial weather will have its accustomed influence upon the wheats.

We have to notice a decided improvement in the demand for nearly all kinds of wheat, which have appeared in better condition than for several months past; and prices have had an upward tendency, the rise in them being from 2s. to 3s. per qr. The trade, however, has been far from brisk, owing in a great measure to the present dearth of money, and, consequently, to the absence of speculation both here and abroad. That we shall have a high range in the value of discounts for a considerable period must be evident to all who have watched the progress of our commercial greatness, and that the price of corn must be influenced by the value of money is equally clear. But even without much speculation, our importations will, no doubt, be fully equal to our additional wants; hence, to calculate upon a high range in the price of wheat during the next four or five months, is to exhibit a want of business foresight. At the present moment, our stocks of foreign grain are reduced to a narrow compass, and the supplies on passage to England are limited; but we must bear in mind that the navigation of the Upper Baltic is now re-opening, and that we shall receive fully our usual import from Russia in addition to heavy arrivals from the United States. The wants of the Peninsula are now well met, consequently we may assume that most of the vessels arriving off our coasts will enter British ports to unload. We are certainly not prepared for a decline in present rates, as we cannot get rid of the important fact that a large consumption is going on, and that, in order to make good consumable flour (owing to the bad condition in which our last year's crop was secured), there *must* be a continuous demand for foreign produce. Very large supplies of barley have come in during the month; but the quantities shown in Mark-lane have been trifling, from most of the cargoes having gone direct into the hands of the distillers, who have still a large number of orders on hand for raw spirit. As was the case last year, our Russian advices state that only limited quantities of produce will be forwarded to England this season. This is a very lame effort to keep up prices; but the experience of last season has, no doubt, taught our importers a lesson, not to place too much reliance in circulars emanating from certain houses at St. Petersburg.

Some of the accounts from the interior of America bring unusually low prices for flour; but at the great shipping ports—New York, Baltimore, &c.—the quotations show no margin of profit laid down here; still, our impression is that quite as much food will be received from the United States this year as in 1856.

Numerous contradictory opinions have been expressed in reference to the quantity of wheat now in the hands of the

home-growers, and the falling-off in the sales has been taken as a proof that the supplies are greatly reduced. The decline in the transactions is, no doubt, the result of the late continuous fall in the quotations, and the unwillingness on the part of farmers generally to part with grain at present currencies. For our parts, we believe that there is now quite as much wheat in the stackyards as there was at this period in 1856, though its quality is certainly inferior.

Although fair average supplies of potatoes have come to hand from our own districts, including Scotland and the continent, prices have considerably advanced, the best samples having risen at the waterside in London to 170s. per ton. This high figure, however, can scarcely be supported, as extensive supplies have yet to come forward.

The wool trade has been much less active during the month, and in some instances prices have given way, owing to steady importations from our colonies, the high value of money, and the commencement of large public sales both in London and Liverpool. Apparently, wool has seen its highest range here and on the continent, especially as the prospects of future imports is certainly good.

There has been much less activity in the markets for linseed and cakes. Prices have ruled rather easier, although the supplies of those articles expected here from India are by no means extensive.

Guano has been disposed of at very high rates—too high, indeed, to suit the views of the small cultivators. When shall we see the end of a monopoly in an article so much required by our agriculturists?

Stock, throughout the country, is still very dear, under the influence of an immense consumption. The lambing season has gone on extremely well.

The Irish and Scotch markets have been but moderately supplied with grain. In the early part of the month the trade generally was in a depressed state; since then, however, the demand has improved, and prices have had an upward tendency. Indian corn, the consumption of which in Ireland continues enormous, has advanced 1s. to 2s. per qr. From Scotland, rather large quantities of wheat, in very poor condition, have been forwarded to the south, where they have sold at very low prices. Barley and oats, however, have been held at comparatively high rates.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The leading topic of discussion amongst graziers, as well as consumers generally, during the month, has been the probable effects of the order in council, prohibiting the importation of stock from the territories of the Emperor of Russia, the King of Prussia, or of the Grand Duke of Mecklenburgh Schwerin. This order has naturally led to some excitement in the trade, and prices have, as a necessary consequence, been on the advance; but our impression is, though it may be at variance with the opinions of many practical men, that it will not have any great influence upon our markets. There is no question in our minds but that a virulent disease, similar in character to that which attacked the cattle in this country some fifteen years since, has

broken out in the territories referred to, and that great losses have been sustained by the graziers: still, to produce important changes in our markets, it must be shown that we have hitherto drawn largely from the countries indicated, and that importations will almost wholly cease. It is well known that, since the passing of the new tariff, we have drawn our foreign supplies of stock principally from Denmark, Hambro', Holland, Spain, and Portugal. At one period we received a few beasts from Prussia and France; but latterly those supplies have wholly ceased, owing to the great demand for them at home. As regards Russia, our sole dependence upon that country has been confined during the last twelve years to 40 oxen, which were sent here at a considerable loss: indeed, we may safely state that we shall *never* receive importations from the Upper Baltic, for the all-important reason that the stock is wholly unsuited to our markets, and from the high cost of freight. The principal port through which disease in sheep may be imported into this country is Hamburgh, from whence we are now importing a few hundred head per week, and which are composed of merinos in very poor condition, chiefly bred on the borders of Mecklenburgh Schwerin. From that portion of Europe, we occasionally receive a few oxen, originally the produce of Prussia, judging from their frames and colour. Without entertaining any feelings of alarm on the subject, it is quite apparent that too much caution cannot be shown in the inspection of stock received here, prior to being landed; and, even in the event of disease escaping the eye of the inspectors, it is not very apparent to us that the contagion will rapidly extend itself throughout the country in the present state of the trade, as it is well known that foreign beasts and sheep pass almost immediately into the hands of the butchers, and are not sent into our marshes to fatten, and where contamination would be highly probable. This, indeed, is the most serious point to be considered; yet, as all efforts hitherto, to improve the weight of the foreign stock imported into England, have turned out a complete failure, the change of food and climate having been most prejudicial to health, it is scarcely possible that breeders and feeders will be disposed to enter into a speculation of this nature, which can only lead to a heavy sacrifice of capital. The leather trade is not likely to be greatly influenced by a prohibition of an import of raw-hides, as the article of leather will be allowed to arrive as usual, even from infected countries.

The present dearth of animal food in this country has called forth a number of opinions in reference to the causes which have lately governed our markets. In one quarter, we are informed that "the supply of stock has not kept pace with the increase of population, in other words, with the demand;" and we have been referred to the unusually small supplies shown in the Great Metropolitan Market, compared with former seasons. Let us briefly examine this important question, in order to discover whether our graziers—men renowned for their enterprise, skill, and intelligence—have failed to produce the usual amount of food to meet the consumption. In the observations just quoted there is a much wider difference than the writer imagines. Population is one thing, demand another matter of striking importance. It is no proof that because the London market, which rules the value of meat throughout the United Kingdom, has been scantily supplied, production has fallen off; and why should it have declined? For some years we have had no serious disease to carry off stock prematurely; prices have been unusually remunerative, and, although the demand has been extensive, and

which has resulted in high quotations, we maintain that production has fully kept pace with the population. The present enhanced quotations are the result, then, of an increased demand for food, and the limited supplies of stock which have lately reached us from abroad. Let those supplies increase—which by the way we can hardly anticipate, as the demand on the Continent is very extensive, and as prices there are on the advance, especially in France—and our quotations will speedily recede to nearly their former level. We are told again that the available supply of stock in the United Kingdom has considerably declined of late years. Upon this point, however, we entertain an opposite opinion; still, whatever may be said upon this question, it is clear that the great activity in the trade and commerce of the country, and not an increase in the population, has led to an improved demand for food, and with it high quotations.

The health of both beasts and sheep, throughout the United Kingdom, has been remarkably good; and as the stocks of winter food have lasted well, the breeders and feeders, notwithstanding that oilcake has ruled high in price, have possessed advantages in this respect not experienced in the two previous seasons, when hay was exceedingly scarce and dear. In a comparative sense, the condition of the beasts derived from Norfolk and Suffolk, since the commencement of the year, has not been to say very prime; but we may observe that the sheep, with very few exceptions, have come to hand in first-rate condition; still prices have advanced, until Downs in the wool have sold as high as 6s. 2d., out of the wool 5s. 4d. per 8lbs. The lambs received in London during the month have been tolerably good. Except towards the close of the month, when supplies generally were on the increase, the trade has been in a very healthy state. The imports of foreign stock into the metropolis have been as under:—

Beasts.....	1,352 head.
Sheep.....	2,411 "
Lambs.....	14 "
Calves.....	1,015 "
Pigs.....	22 "
Total.....	4,814

In the corresponding month in 1856, the arrivals were 1,924; in 1855, 4,253; in 1854, 4,760; in 1853, 14,787; and in 1852, 5,444 head.

The total supplies from all quarters, shown in the Great Metropolitan Market, were as follows:—

Beasts.....	18,601 head.
Cows.....	460 "
Sheep and lambs.....	92,810 "
Calves.....	1,240 "
Pigs.....	2,025 "

In April, 1856, there were shown 18,427 beasts, 482 cows, 102,030 sheep and lambs, 789 calves, and 2,375 pigs. Thus it will be seen that the supplies of beasts have been tolerably extensive during the month just concluded; but that those of sheep, compared with last year, have fallen off by about 10,000 head. We believe, however, that fully 12,000 carcasses of mutton have been forwarded to Newgate and Leadenhall markets in excess of last year in the same period.

From Norfolk, Suffolk, Essex, and Cambridgeshire we have received, since we last wrote, about 10,000 Scots and shorthorns; from other parts of England, 2,800 of various breeds; from Scotland, 1,370 horned and polled Scots; and from Ireland, wholly via Liverpool, 479 oxen.

Beef has sold at from 3s. 4d. to 5s.; mutton in the



wool, 4s. 6d. to 6s. 2d.; out of the wool, 3s. 8d. to 5s. 4d.; lamb, 5s. 10d. to 7s. 4d.; veal, 3s. 8d. to 5s. 10d.; pork, 3s. 8d. to 5s. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	April, 1855.			April, 1856.		
	s.	d.	s. d.	s.	d.	s. d.
Beef, from .....	3	2	to 5 0	3	2	to 4 10
Mutton .....	3	2	— 5 0	3	6	— 5 3
Lamb .....	5	4	— 7 0	6	0	— 7 4
Veal .....	3	3	— 5 0	4	0	— 5 3
Pork .....	3	4	— 4 4	3	6	— 4 3

Newgate and Leadenhall markets have been well supplied with each kind of meat, which has sold somewhat steadily, as follows:—Beef from 3s. to 4s. 6d.; mutton, 3s. 4d. to 4s. 8d.; lamb, 5s. 6d. to 7s.; veal, 3s. 6d. to 5s. 2d.; pork, 3s. 10d. to 5s. 2d. per 8lbs., by the carcass.

S O M E R S E T S H I R E.

We have had more than the usual fall of rain this month, accompanied by heavy hail-storms; about the 7th and 8th, we had the water higher than during the winter on the low lands liable to be flooded. This is rather later in the season than is considered beneficial. The water has greatly hindered the putting in of barley and potatoes, and sowing the grass-seed. A good deal of barley and April wheat is not yet in, and potato-setting has not been so backward for several years. Some dry weather is badly wanted. We had after the 18th some few spring days; but on that day a heavy storm of hail, accompanied by thunder, fell in some parts of the country; and it was not before the 13th or 20th that much could be done. The 22nd and 23rd were again wet, and a stop was put to the work. On wet soils the wheat looks yellow, and there is some appearance of the wireworm. If next month should be dry, our prospects are fair; but otherwise, the wheat plant is too luxuriant. Beans are coming up well, also the oats; and the few winter beans look well. Our pasture land has been so wet, that

few of the cattle are turned out; but the grass will soon be fit for stacking, if it become dry. While the price of poor stock has not gone down materially, there is a slackened sale for them. Poor sheep come by no means freely to market, though equal to the demand; while this is the case, the present high prices will be maintained—8s. to 10s. per head higher than last year. Beef is in short supply, and obtains 10s. 6d. to 11s. 6d., and even 12s., per 20lb., to sink the offal. Mutton, 3d. to 9d. per lb. in the wool. Lamb is rating very high, 30s. to 34s. each—8lb. to 10lb. per quarter. Not much doing in wool—1s. 6d. per lb. The prices of corn, on the other hand, have gone down; the best white not fetching over 7s., whilst inferior sorts have been selling from 5s. 6d. to 6s. 6d. per bush.—the latter price being paid for best 62lb. red. During the past week there has been an advance on the best white of 3d., and 1½d. on red. Flour, 38s., 39s., to 40s. for best seconds. The milling trade is a very bad one. Bakers are doing better, the price of bread following that of flour; whereas millers advance the prices of wheat before they can realize one on flour, which is not regulated, as it should be, by the price of wheat. Since the alteration of the corn laws, the much greater irregularity in the price of wheat is very striking, though it was contended by the advocates of that measure that it would ensure greater regularity. This see-saw state of the wheat market is very perplexing to all parties. Barley maintains its price better than wheat; grinding 6s., malting 5s. 3d. to 5s. 9d. The supply of beans not very plentiful—5s. to 5s. 3d. per bush. Oats, 22s. to 24s. per qr. Cloverseed has receded 10s. to 12s. per cwt.; rather better rates this week (a great loss to the buyers at 75s. to 80s. per cwt.); present price 60s. to 65s., extra 70s. There is little at present for the thrashing-machine to do, and the supplies have fallen off, but there are more ricks than usual at this season; their being thrashed before harvest will depend on the price. Millers' stock moderate—little beforehand. The stock of corn generally short in second hands. Farmers complain of the yield of last year.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BEDFORD FAIR.—There was a plentiful supply of stock and sheep; but the prices demanded were exceedingly high, and consequently the sale was dull.

BICESTER FAIR.—The show of stock was good, and a large portion of it was disposed of at high prices. London cows realized from £13 to £24 each, and dealers' heifers from £16 upwards. Barren cows were high, and country heifers and stirks changed hands freely. Many of the pens of sheep were very superior. Couples ranged from 45s. to 55s., and tugs in the wool from 40s. to 50s. Mutton in the wool 6s., and out of the wool 4s. 8d. to 5s. per stone. There were not many horses, but those that were useful made great prices. Store pigs very dear. Fat hogs 12s. per score.

BOGBAIN MONTHLY MARKET.—There was an excellent show of cattle and sheep. After the high prices given at the Muir of Ord on the two previous days, and the high prices quoted at recent markets in the south, the expectations of the sellers were high, and in the early part of the day they stood firm for a rise in prices. Eventually, however, prices were regulated by those of the Muir of Ord, although the tendency was decidedly upwards, and in some cases higher prices were given. Sheep were not in eager demand, but the prices given were those of the Muir of Ord. Sales of cattle went on briskly, and before the market closed the greater part of the stock had changed hands. The following were among the sales effected: Mr. Fraser, Kerrowgair, sold a lot of two-year-

olds at £5 5s., to Mr. Barrie, Stonehaven; Mr. Macbearn, baker and cattle-dealer, Inverness, sold a lot of heifers, two-year-olds, at £4 10s., to Mr. Wilson, Crieff; Mr. Gair, Hilton, sold a lot of cross stirks at £9; Mr. Addison, Craigmore, sold a lot of crosses at £6.

BOLSOVER FAIR.—The number of cattle was rather over the average for this fair, and those shown were of a first-rate quality. Fat beasts were sold from 8s. to 8s. 6d.; in-calvers and cows in milk very dear; there were in-calvers sold as high as £22; barren beasts very dear, and a good show. Fat sheep, without wool, from 7d. to 7½d.; stock hogs, in wool, fetched high prices; all kinds sold. No horses shown. Pigs very few, and high prices were asked. There was a good deal of cattle changed hands, and plenty of buyers. Nearly all sold at the close of the fair.

BRAMPTON FAIR.—The number of cattle and sheep was more than usually large; and from the fodder and turnips having fully met the contingencies of the season, both kinds were in good condition, and well adapted for fattening. Cattle especially had a thriving appearance, and promised with a good supply of grass to be soon ready for the butcher. There was a good attendance of buyers (some of them from and purchasing for the luxuriant dales of Yorkshire), who did not hesitate in giving such high prices as will probably lessen much the pay expected for the summer's grass. Trade was brisk, and an advance over last year's rates was generally obtained.

Sheep met with a fair demand, at high figures. The prices of half-breeds ruled from 28s. to 46s. each; Cheviots, from 17s. to 31s. From 12s. to 21s. appeared to be the remuneration which farmers received for keeping the lambs since the autumnal fairs. There was a small show of pigs, which met with no lack of customers at almost unprecedented prices. From 23s. to 31s. each were given, and the supply was soon bought up.

**BRECHIN TRINITY MUIR CATTLE TRYST.**—The number of heaves was rather under an average, but the general quality of the stock was excellent. All sorts of beasts were higher priced than last season, and comparatively few good animals remained unsold. One-year-old stots and queys, bred in the district, brought £5 to £9, two-year-olds do. from £8 to £15, and three-year-olds do. from £14 to £22 per head. The best quality of fat sold readily at 10s., while the middling kinds brought from 8s. to 9s. per Dutch stone, to sink the offal. There were few good lean cows in the market, which soon exchanged owners on much the same terms as the middling quality of fat. The drove cattle from the northern counties brought from £9 to £16 per head, or from 6s. 6d. to 7s. 6d. per stone of their estimated weight when fat. The demand for small stirks, or farrow cows, in bad order, was rather slack, and of this class a part was left unsold. All the best kind of heaves was from ten to fifteen, and good grazing animals from five to ten per cent. higher than last year; but there was little advance in the value of small lean stock. The market, on the whole, was a selling one for everything good, both dealers and feeders appearing well pleased with the rates.

**CARLISLE FAIR.**—There was a large show of cattle, but the quality was inferior, and the prices asked very high.

**CAWDOR TRYST.**—The attendance of farmers and dealers was very fair for a first occasion, and there was also an average number of cattle on the ground, some of which were in very fine condition. Towards evening sales were effected pretty rapidly; and though prices did not reach the expectations of some holders, still few lots remained unsold at the close of the market. The following are a few of the sales which took place:—Mr. Wilson, factor for Glenfernness, sold a superior lot of three-year-old cross stots at £19; Mr. Mour, Mains of Ardersier, a fine lot of 20 three-year-old ditto, at £187s. 6d. Captain Sharp, Newton, Cawdor, sold a mixed lot of cross two and three-year-olds at £17, and another lot of two-year-old cross stots at £15, with luckenny. Mr. Hutcheson, flesher, Campbelltown, a lot of three-year-old shorthorns at £14 10s. Mr. Mackintosh, Blackpark, sold cross two-year-olds at £11; Mr. Mackintosh, Auchnacloch, ditto, at £9 15s.

**CHESTER FAIR.**—There was an absence of fat stock, but a large show of milking stock, which did not meet a brisk sale. Prices were about the same, store pigs having slightly advanced. In the horse fair the show of good sorts was small, and prices underwent no alteration.

**CHIPPENHAM MONTHLY CATTLE MARKET.**—Heifers fetched from £17 to £26. Sheep, both fat and stock, were in good demand. One pen of 100 stock Sheep, belonging to Mr. John Morris, of Avon, fetched 48s. 6d. per head; fat Sheep were equally high in price.

**DERBY FAIR.**—The show of horned cattle was large. Superior barren cows and milking cows were sold at high prices; inferior of both sorts the turn lower. The sheep fair was large, and readily found customers at high prices. The horse fair was small; very few good horses were shown, and but little business done, the prices being in favour of the buyer.

**DEVIZES FAIR** was a very small one both for sheep and cattle; there were about 3,000 sheep penned. Trade was very brisk, and all were quickly sold, tegs at from 30s. to 44s. a-head, and ewes at from 40s. to 50s. There were about 300 head of cattle; heifers sold at from £15 to £22 each; of beef there was scarcely any, price from 11s. to 12s. per score. Horses were numerous, and generally low in quality; the best were sold at good prices.

**EAST GREENHEAD FAIR.**—The trade was most brisk, much more so than on any former occasion in the memory of any of the present inhabitants. There was a fair supply of horned stock and sheep, but scarcely a hoof returned from the fair unsold. It was calculated that every head of lean stock has risen in price since last year 50s. a-head from six-months-old calves and upwards. There were some fine fatted

shorthorn beasts sent in from Holly-bush Farm—a credit to the owner. There was a large supply of store hogs, and we believe a fair business done in them.

**EGREMONT FAIR** was supplied, as usual, with geld and young cattle. There were very few cows.

**ELGIN FAIR.**—The sheep sales commenced about nine o'clock, consisting of three-year-old crosses (wethers) and hogs; the demand was very brisk, and a great many sales took place, at high prices. Wethers brought from 32s. to 33s., and hogs 30s. to 33s. The whole were cleared off by one o'clock. There was a very large show of cattle, and fat stock was much in request. Prices were very stiff at the commencement, but holders of stock yielded a little, and a great number changed hands.

**EVESHAM FAIR.**—There was but little fat stock, but cows and calves were more plentiful, as also sheep and lambs. The demand was good. Everything fit for the butcher met with a ready sale, at prices in advance of last fair. Beef 7½d., mutton from 7½d. to 8½d. Mr. Smith sold several pens at satisfactory rates. There were a few good horses of the cart kind; prices ranged high.

**FENWICK HORSE MARKET.**—There was a large number of superior animals on the ground, and a good attendance of farmers and dealers. Sales were in general brisk, there being a good demand, and many animals changed hands. Prices ranged much the same as at previous markets this season. Good animals brought from £40 to £55, and inferior from £25 to £35.

**GRANTOWN CATTLE TRYST** was well attended both by sellers and dealers, and fully an average stock appeared on the ground, notwithstanding that a good many lots had been picked up in the district previous to the market. Sales commenced briskly early in the day, and continued so throughout. The prices realized on good cattle would be about 20 per cent. above the corresponding market of last year, and inferior stock about 10 per cent. The following are a few of the sales reported: Captain Grant, Congash, sold a lot of two-year-old Highland queys at £8. The rev. Mr. Stewart, of Abernethy, sold three two-year-old cross stots to Mr. George Grant, of the Richmond Arms, Tomintoul, for £36; and two Highland torks to Mr. Stewart, Tomcrocher, for £11. Mr. Graut Cleishner, Glenlivet, bought a lot of nineteen three-year-old, Highland stots, being the top of the market, from Mr. Low, Bailmore, at £14 a-head.

**LINCOLN FAIR.**—First-rate horsea soon found eager purchasers; many fetched from £100 to £200. A thoroughbred horse was sold for the latter sum to Mr. Percival, of Peterborough. Really good saddle horses were worth from £50 to £80, according to breed, size, and qualification. Mr. Gething, of Newark, stabled a splendid dozen at the Queen Inn, one of which was sold on Monday afternoon for £185. Mr. Robinson, of Manchester, who for some time past has been a recognized agricultural dealer, had a string of forty splendid animals, which were only parted with for the best prices. On Tuesday morning strings of dealers' horses, brought from the neighbouring fairs, came into the town, and business was very brisk. The fair on Wednesday was very slack for the better class of horses, the dealers asking much more money than the purchasers were inclined to give. Good hecks made from £30 to £40, though they were to be found at a much smaller sum. M. Bamberger, of Berlin, bought two entire horses for the sum of £250, for Russian studs. M. Sohmitz, of Brunswick, and M. Donatto Grefswald, of Prussia, each purchased a dozen splendid hunters and chargers. Cart horses, upon the whole, sold for £10 less than what they would have fetched the previous year. There was, however, such a large show of horses that buyers were not over anxious to purchase. **THE SHEEP FAIR.**—The show was a larger one than has been seen in Lincoln for some years, if ever such a one was seen before. It is estimated that at least seventy thousand sheep have been penned; and early in the morning sellers asked heavy prices, from 70s. to 80s. being demanded. Although there were plenty of buyers, purchasers were rarely to be met with at these extravagant rates, and prices may be quoted at from 4s. to 5s. per head decline. The ruling price for hogs seemed to be from 40s. to 50s. and 55s., some prime lots of lamb-hogs fetching as much as 66s. The prize for the best pen of twenty hogs has again fallen to the lot of Mr. Battersby, of Scotherne. The prize is a silver cup given by Messrs. Smith, Ellison, and Co., of Lincoln. The sheep were disposed

of at 90s. per head. The only competitor against Mr. Battersby was Mr. Hayward, of Wellingore. The quality of nearly all the sheep penned was remarkably good, and we did not see one pen of poor hogs.

**NEWARK FORTNIGHTLY MARKET.**—There was a large number of sheep, but only a limited number of beasts. The prices of beef were similar to last week, viz., 7s. 6d. to 8s. 6d. per stone; mutton in the wool, 7½d. to 9d., naked, 7½d. to 8d. per lb. There were 1,220 sheep and 41 beasts penned.

**PENRITH FAIR.**—The Scotch breeders exhibited a very large quantity of stock. It was computed that the total number shown would be about 25,000. One pen of Leicester hogs sold for 55s. each. Mr. Gray had about 5,000 half-breeds. The price asked in the morning was 60s., but the top price at which sales were effected was 55s.; great numbers were sold at considerably less prices. Grey-faced hogs would run from 35s. to 45s. each, and small country hogs were sold from 18s. to 30s. each. Upon the whole, it has been considered a slow and dear market. The dealers had bought at high prices, and were anxious to keep as much up to the mark as possible. A great number of sheep remained unsold.

**SOUTHWELL FAIR** was well attended. A good business was transacted.

**TIVERTON GREAT MARKET.**—There was a fair show of stock. Although prices ruled excessively high, the beasts exhibited met with a ready sale. The weather being fine, we

had a large number of visitors. Fat bullocks, 11s. per score; cows and calves, £12 to £23 each; barreners, 7s. to 9s. per score; working steers, £26 to £32 per pair. The supply of sheep was not a large one. Fat wethers (with their wool on) 8d. to 8½d.; fat ewes (in wool) 7d. to 7½d. per lb.; store hogs, 40s. to 50s. each; ewes and lambs, 45s. to 55s. per couple; fat lambs, 9d. per lb.; rearing calves, 35s. to 40s.

**TOWYN FAIR.**—The supply of stock was very small, no doubt owing to the scarcity of cattle in the country, as well as many being sold at Machyllneth on the Monday previous. A great many farmers were present as drovers. Steers, rising two years old, fetched from £3 to £9 per head. Cows in calf £12, and a few changed hands; but the lean stock were almost all taken away unsold.

**WORCESTER FAIR** was tolerably well supplied with beasts, both fat and store, of good quality, but in consequence of the presence of many anxious buyers, a complete clearance was effected. Fat beef brought from 7d. to 8d. per lb. Good stores fetched great prices; the leaner were rather slower of sale. Of fat sheep the supply was good, and a ready sale was effected; prices varied from 7d. shorn, to 9d. in the wool. Stores were abundant, and tugs sold for 32s. to 50s., couples 48s. to 60s. There was no veal in the fair. Fat pigs were numerous, and went at 11s. per score. Stores were a good sale, at very remunerative prices.

## REVIEW OF THE CORN TRADE. DURING THE PAST MONTH.

The month of April has been characterized by unusual changes of temperature, the first fortnight being warm and rainy, followed by cold; then an almost summer-heat; and, lastly, a return to cutting wind and occasional sleet. Rapid progress was made, in the earlier part of the month, in all vegetation; and though a check to its progress must finally have been given, it may prove serviceable to the wheat-plant, by preventing a premature development of the ear, as well as to the corn-ricks, by improving the condition of the grain. The markets have not been so well supplied as in the previous month, or as in the same time last year; and foreign arrivals generally have continued on a limited scale. The condition of the samples has slowly improved; and the inferiority of the bulk in this respect has deprived the trade of elasticity, and the usual tendency to speculative purchases. The absence, however, of large foreign arrivals, has afforded an opportunity to foreign holders to reduce their stocks in granary, and enabled growers more readily to place their bulks; and the downward aspect with which the month commenced has given place to an improved tone; the loss in price sustained in the first fortnight being recovered, leaving the value about one shilling improved in the course of the month. Everywhere, the growing crops, hitherto, have been well spoken of, the plant being mostly even, with fewer gaps than usual, the seedtime having been very favourable; but, with four months to elapse

before harvest can be gathered, and the most critical periods to pass, it will not be safe to reckon on a superabundance. The same favourable appearances obtain in foreign countries. Spain has every prospect of passing from great scarcity to a bountiful supply, though the fact that less has been sown in consequence of unfavourable seedtime must make some abatement in the prospect. Large foreign shipments from all parts to that country have enabled it to pass a crisis of great anxiety. In all her towns prices have been rapidly falling; and the Government has greatly contributed to the movement by forced sales, so that prices are without any dependence. The expected permission to export from the Roman States has not been granted, the last crop being deficient, though that on the ground looks fine. At Genoa, where a fall was constantly expected, a large demand for the interior has advanced rates 1s. per qr. Hard Taganrog wheat there was worth about 75s., and soft Berdianski 69s. In France the crops look well; but the northern departments have somewhat advanced prices. The best wheat, at Paris, was still worth about 65s. per qr., and the best flour about 49s. per sack English, against our town price of 52s., though 9s. above Norfolks. In the south, however, markets have been rather lower, in consequence of large arrivals at Marseilles. In Belgium, good native wheat is worth 57s. per qr.; in Amsterdam, fine white Zealand about 62s. The Baltic markets, under the influence of our late de-

cline, have been giving way: the new shipments, and arrivals of vessels frozen in, may bring supplies thence, by the end of next month, to the extent of eighty or ninety thousand qrs. The best wheat, at Dantzic, was worth about 56s.; at Stettin, 51s. per qr. Rostock quotes 49s. 6d. per qr. for the best red. At Petersburg, good soft wheat for August delivery was 44s. 7d. per qr.: for Saxonska, deliverable in May, 54s. 6d. was demanded. Ghirka wheat, at Odessa, was quoted at 41s. 6d. to 44s. 6d.; soft Polish, 43s. 6d. per qr. At Berdianski, rates were still 52s. 6d. per qr. for wheat on the spot; but there was scarcely anything passing. The Danubian markets were declining. Wheat, at Galatz, was 32s. to 43s. 6d. per qr., with a freight of about 8s. 6d. per qr. to England. The canals in North America not being free, New York possessed but a very limited stock, and was sensitive upon the reception of European advices, being as yet more affected by a rise than by a decline. The quotation for red wheat, taking the weight at 62lbs., was—red Southern, 48s. 6d.; red Western, 49s. 9d. per qr. White Canadian, 54s. per qr. As some time must elapse before large supplies arrive per canal, the probability was that prices would improve till arrivals were in excess. At New Orleans 62 lbs. wheat was worth 53s. for red, and white 56s., free on board. The last accounts<sup>d</sup> from Chicago quoted 102c. to 106c. per bush., (equal to 34s. per 480 lbs.) for winter red wheat, 121c. to 125c. for white (35s. 6d. per 480 lbs.) The stock was 10,000 qrs. With English stocks reducing, and passing into firmer hands, there does not now seem much probability of declining markets, especially as no very large supplies can come from abroad for the present; but on the other hand, should fine weather set in, the fact that we are at peace with Russia, should that country and America be blessed with the prospect of fine harvests, may operate as a check to any material improvement. The wheat market in London commenced on the first Monday with fair supplies, and the previous week having been universally dull, with lower rates, the appearance of a rather larger quantity before a complete clearance was made of Friday's samples renewed the feeling of depression, and millers were only tempted by a further abatement of 1s. to 2s. per qr. from the previous rates, but a small business being done at this reduction, Kentish factors making the decline still more. Holders of fine foreign not being disposed to press sales, prices were nominally as before for the best quality, but inferior new was quite as difficult to quit as English at an equal reduction. The country did not fully respond to this dulness of the metropolis. Leeds, Wakefield, Boston, and some other places made no concessions. Birmingham

and Newcastle did not yield more than 1s., but Lynn and Bristol coincided with London. Liverpool, though dull, made no change in either of her markets. On the second Monday the supplies were not so good, and there was a better demand for the best qualities, both English and foreign, at fully the previous prices. This improved tone was answered in the country by a general improvement of 1s. to 2s., the weather turning bad, Louth realizing the extreme advance. Liverpool on Tuesday made no change, but on the closing market reported a lively trade at 2d. to 3d. per 70 lbs. advance. The third Monday gave but a limited show of samples, both English and foreign, and though the weather became favourable, 1s. to 2s. more was obtained for fine English, though secondary and inferior sorts were not improved; the foreign trade participating in the advance, but on the whole, business was far from brisk. Cold and rainy weather set in on the following Wednesday, which added to the improvement in the country. Most of the markets quoted an equal improvement with London, with more doing, Spalding, Bristol, and Hull, being fully 2s. higher, and Liverpool quoting a rise on Tuesday of 4d. to 6d. per 70 lbs., but without any further increase on Friday. The fourth Monday gave supplies of much the same amount; but for the morning's addition from Kent and Essex there was a better show in improved condition. Factors, influenced by the severely cold weather and country advices, as well as good attendance, commenced by asking 2s. to 3s. more, but found they could only establish an improvement of 1s. per qr. on the previous week, and that not readily, fine foreign occasionally realizing the same advance. The supplies as compared with March last show some increase, viz., about 1,000 qrs. weekly, averaging 7,776 qrs. English, and 7,483 qrs. foreign; but last year at the same time the foreign was double as much. The general averages during the month have fallen 2s. 6d., commencing at 55s. 6d., and closing at 53s., which is probably the lowest point; they therefore seem to contradict the general report of a rise; but it must be remembered that these sales include all the low sorts, the prices of which are not regarded, only fine samples serving as a standard of value. The sales noted during the month show a falling off, as compared with 1856, of 36,789 qrs. in the course of the month. The London averages passed their lowest point on the third Monday, when they were 56s. 5d., commencing at 59s. 2d., and closing at 58s. The cessation of the demand for wheat for the Spanish Peninsula has reduced the quantity exported, (which in March was 13,609 qrs.,) to the small quantity of 148 qrs.; and in flour it has fallen from 8,867 sks. to 766 sks. In flour there have

been but slight alterations through the month. Town-made samples have not varied the price, 52s. remaining unchanged. Norfolks, which commenced at 38s., closed at 40s., the rise taking place on the last two Mondays successively. American have also participated in a like improvement. The weekly supplies average much as in March, but showing a moderate decrease, both of country and foreign. The receipts have been in country sorts 68,731 sacks, in foreign 796 sacks and 20,021 barrels. The rates in New York for the best extra quality Genesee were 34s. per barrel, f.o.b., which equals 48s. 7d. per sack, making the price, freight and insurance included, on nearly a parity with our own town-made quality of 52s.; but this fine sort is seldom shipped except specially. Fair Canadian may be had at 26s. 6d. per barrel. Super-fine Ohio and St. Louis, at New Orleans, were 27s. 6d. per barrel.

Barley, during the month, has passed through some fluctuations, leaving prices much as they were. Had not the malting season been declining there is no doubt fine samples, from their scarcity, would have commanded great prices; but a considerable quantity of foreign has been used for this purpose, and, by report, answers pretty well. The first Monday having a large importation of foreign, the market renewed a shock, and prices gave way 1s. to 2s. per qr. On the second Monday, with an equally large quantity of foreign, no further decline was noted. On the third Monday, with very limited supplies of English and some abatement in the foreign arrivals, there was a recovery of 1s. per qr.: and on the last Monday there was an improved feeling, from the known exhaustion of the stocks of English, and an active demand for malting and distilling, from the return of cold weather, which favoured the manufacture of malt, which is but in limited stock. The weekly average supply of English this month has only been 1,151 qrs., while the foreign has reached 26,614 qrs., being nearly 10,000 qrs. weekly beyond the supply of March. The fact of the exhaustion of the English crop appears in the weekly sales for the whole country, which have been brought down to 22,428 qrs., at 44s. 7d. In the last week of December they were 107,336 qrs. It is doubtful whether foreign supplies will make up the void between this and harvest; and therefore it seems unlikely that rates can be very low, though substitutes be used. A great breadth appears to be sown; but some is not yet in the ground in Ireland. The sowing both of this grain and oats has been greatly hindered by wet weather. Malt has scarcely varied through the month, having improved only about 1s. per qr.

Large foreign arrivals throughout the month

have reduced the prices of oats about 2s. 6d. per qr., but there were symptoms of reaction at the close. The first Monday had the heaviest supply, and as the trade had previously been dull, prices were reduced 1s. to 2s. per qr., a great many cargoes of foreign being in very bad condition. The second Monday was plentifully supplied, though not so extensively, and the prices further gave way 6d. to 1s. per qr. On the third Monday they were also liberal, but the trade partially rallied, and 6d. was recovered. The fourth Monday was a repetition of the third in quantity and the advance made. The quantities received in the month have been, in English only 1,421 qrs., in Scotch 2,297 qrs., in Irish 25,467 qrs., and in foreign 127,306 qrs., giving a weekly average of 39,121 qrs., or half as much again as in March. It does not seem likely that lower prices will obtain, as the Irish market has improved, and the sowing there has been hindered.

Beans and peas have been by no means plentiful. Of the former only 1,389 qrs. foreign and 3,399 English have been received in the month. The first Monday noted a fall of 1s., and the last an equivalent advance, leaving prices as at the commencement.

Of peas the quantity has been quite trifling, viz., 280 qrs. English and 60 qrs. foreign. Yet the trade having been excessively dull, and demand unusually limited, they partook with beans in the fall and rise to the same extent.

Linseed has declined about 2s. per qr., with limited arrivals, the price having checked the consumption, but cakes have continued to sell well. The seed season has been passing, and prices of cloverseed gradually receding, till they have become nominal, the inquiry having been unusually small. Tares have been unprecedentedly neglected, good foreign being offered, with little custom, at 35s. per qr. Mustardseed has improved 1s. per bush., stocks being small. Canaryseed has had a sudden start, at the close of the month being 10s. per qr. dearer, the quotation for the best quality having touched 80s. per qr. Hempseed has been dull, without change. Carraway, coriander, and other seeds have not materially varied.

COMPARATIVE AVERAGES—1857-56.

From last Friday's Gaz.		s.	d.	From Gazette of 1856.		s.	d.
Wheat.....	84,689 qrs.,	53	0	Wheat.....	114,384 qrs.,	69	0
Barley.....	22,428 ..	44	7	Barley.....	50,354 ..	39	2
Oats.....	7,973 ..	23	5	Oats.....	12,281 ..	23	7
Rye.....	110 ..	36	3	Rye.....	85 ..	44	7
Beans.....	6,184 ..	40	0	Beans.....	5,968 ..	41	9
Peas.....	769 ..	39	4	Peas.....	768 ..	37	4

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	Mar. 14.	Mar. 21.	Mar. 23	April 4.	April 11.	April 18.
55s. 10d.	—	—	—	—	—	—
55s. 6d.	—	—	—	—	—	—
54s. 8d.	—	—	—	—	—	—
53s. 11d.	—	—	—	—	—	—
53s. 0d.	—	—	—	—	—	—

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white, new....	48 to 59 extra	62 to 67
Ditto, red, .....	47	53
Norfolk, Linc. and Yorks., red, new....	46	53
BARLEY, new, malting....	40 to 41	Chevalier.... 42 46
Distilling....	37 39	Grinding.... 26 32
MALT, Essex, Norfolk, and Suffolk.....	67	72
Kingston, Ware, and town made.....	69	73
Brown.....	62	63
RYE.....	—	30 36
OATS, English, feed.....	20 22	Potato..... 22 28
Scotch, feed.....	20 24	Potato..... 24 30
Irish, feed, white.....	19	21 fine 23 27
Ditto, black.....	18	20 — 21
BEANS, Mazagan, new.....	32 35	Ticks, new.... 34 35
Harrow.....	34 39	Pigeon..... 40 42
PEAS, white boilers....	35 39	Maple.... 33 39
Grey....	30	40 37
FLOUR, per sack of 250lbs., Town, Households, 48s., fine 50	—	52
Country.....	40 41	Households.... 44 46
Norfolk and Suffolk, ex-ship.....	—	39 40

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed, .70 72 high do. ....	76 extra	— 78
Konigsberg.....	68 71	— 73
Rostock.....	52 68 fine....	— 74
American, white, .58 65 red.....	—	54 60
Pomeran., Meckbg., & Uckermark, red 56	63	66 69
Silesian, red.....	52 56 white....	— 65 71
Danish and Holstein.....	52	56 60
St. Petersburg and Riga.....	50	56 fine .54 60
Rhine and Belgium.....	—	—
Russian, hard.....	54 64	French..... (none)
BARLEY, grinding.....	26 31	Distilling..... 35 38
OATS, Dutch, brew, and Polands, .20 25	Feed.....	18 21
Danish and Swedish, feed, .19 22	Stralsund....	21 23
Russian.....	—	20 23
BEANS, Friesland and Holstein.....	—	35 38
Konigsberg.....	32 37	Egyptian.... 35 38
PEAS, feeding.....	35 36	fine boilers.... 36 39
INDIAN CORN, white.....	36 39	yellow..... 36 39
FLOUR, per sack.....	French —	Spanish —
American, per barrel, sour....	24 26	sweet..... 29 32

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
March 14, 1857....	55 6	46 1	24 4	39 10	39 4	39 7	39 2	39 2	39 2	39 2	39 2	39 2
March 21, 1857....	59 10	46 8	24 4	38 10	38 9	38 9	38 9	38 9	38 9	38 9	38 9	38 9
March 28, 1857....	55 6	47 1	23 7	40 9	39 6	38 6	38 6	38 6	38 6	38 6	38 6	38 6
April 4, 1857....	54 8	47 3	23 6	37 8	39 8	39 1	39 1	39 1	39 1	39 1	39 1	39 1
April 11, 1857....	53 11	45 9	24 4	38 9	39 10	38 5	38 5	38 5	38 5	38 5	38 5	38 5
April 18, 1857....	53 0	44 7	23 5	36 3	40 0	39 4	39 4	39 4	39 4	39 4	39 4	39 4
Aggregate average	54 9	46 3	23 11	38 8	39 8	39 0	39 0	39 0	39 0	39 0	39 0	39 0
Same timelast year	68 8	33 1	23 1	44 0	41 1	39 1	39 1	39 1	39 1	39 1	39 1	39 1

MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF MARCH, 1857.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.		Imported from British Possessions out of Europe		Total.
	qrs. bush.	qrs. bush.	qrs. bush.	qrs. bush.	
Wheat.....	15950 5	378 0	15978 5	15978 5	
Barley.....	17208 0	..	17208 0	17208 0	
Oats.....	109329 5	..	109329 5	109329 5	
Rye.....	8319 7	..	8319 7	8319 7	
Peas.....	5379 0	0 4	5383 4	5383 4	
Beans.....	24962 7	1 4	24964 1	24964 1	
Maize or Indian Corn ..	80382 3	..	80382 3	80382 3	
Buck Wheat.....	49 0	..	49 0	49 0	
Beer or Bigg.....	497 2	..	497 2	497 2	
Total of Corn and Grain	552281 4	3790 0	556071 4	556071 4	
	cwts. qr.lb.	cwts. qr.lb.	cwts. qr.lb.	cwts. qr.lb.	
Wheat Meal and Flour.....	141712 2 15	408 1 16	142121 0 3	142121 0 3	
Barley Meal.....	..	..	..	..	
Oat Meal.....	27 3 1	3 0 21	30 3 22	30 3 22	
Rye Meal.....	2 0 0	..	2 0 0	2 0 0	
Pea Meal.....	10 2 5	..	10 2 5	10 2 5	
Indian Meal.....	11 2 1	..	11 2 1	11 2 1	
Buck Wheat Meal.....	5 2 14	..	5 2 14	5 2 14	
Total of Meal and Flour.....	141770 0 8	411 2 9	142181 2 17	142181 2 17	

PRICES OF SEEDS.

BRITISH SEEDS.

CLOVERSEED, red, per cwt.....	46s. to 72s.
Ditto white .....	50s. to 60s.
TREFOIL, per cwt.....	27s. to 30s.
TARPS, per bushel.....	4s. 6d. to 5s. 0d.
MUSTARDEED, per bushel .....	12s. to 13s.
CORIANDEED, per cwt.....	20s. to 24s.
CARRAWAY, per cwt., new .....	—s. to 50s..old —s. to —s.
CANARY, per qr.....	72s. to 80s.
LINSEED, per qr., sowing .....	—s. to —s., crushing 68s. to 70s.
LINSEED CAKES, per ton .....	£9 10s. to £10 0s.
RAPESEED, per qr., new .....	86s. to 88s.
RAPE CAKE, per ton.....	£5 0s. to £5 10s.

FOREIGN SEEDS. &c.

CLOVERSEED, red, French 70s. to 78s. ..	American... 70s. to 74s.
Ditto white .....	50s. to 63s.
TARPS, per bushel, new.....	4s. 3d. to 4s. 6d.
HEMPSEED, small, per qr. ....	—s. to 40s...Do. Dutch 42s.
CORIANDEED, per cwt.....	15s. to 20s.
CARRAWAY .....	42s. to 46s.
LINSEED, per qr., Baltic.....	65s. to 68s....Bombay 68s. to 70s.
LINSEED CAKE, per ton.....	£10 0s. to £11 0s.
RAPESEED, Dutch.....	76s. to 80s.
RAPE CAKE, per ton.....	£5 0s. to £5 10s.

HOP MARKET.

BOROUGH, MONDAY, April 27.—During the past week there has been a more active inquiry for fine Hops of all descriptions. Sussex samples with colour have also been in good demand at an advance on last quotations. Inferior qualities are dull of sale. HART & WILSON.

CHELSEFIELD AND HALSTEAD, (April 21).—Poling is going on as vigorously in the Hop plantations as it has been of late at the elections, and the bine looks clean and healthy.

SHOREHAM, (KENT).—In the Hop gardens men are busily engaged poling, and we shall soon have to report the progress of the plant.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, April 27.—During the past week the arrivals coastwise have been moderate, and best samples of Regents made more money, but second-rate and reds were rather duller. The following are this day's quotations:—

York Regents .....	per ton 140s. to 180s.
Lincolnshire do. ....	120s. to 150s.
East Lothian.....	140s. to 180s.
Do. Reds.....	110s. to 120s.
Perth, Forfar, & Fish. Reg.	120s. to 150s.
Do. Reds.....	100s. to 110s.
German whites .....	100s. to 105s.

BOROUGH AND SPITALFIELDS, LONDON, MONDAY, April 27.—Since Monday last the arrivals of home-grown Potatoes, coastwise and by land-carriage, have been seasonably good. The imports have been rather extensive, viz., 20 tons from Ireland, 7 tons from Leon, 300 tons from Harlingen, 63 tons from Ternengen, 1,339 sacks and 345 bags from Schiedam, 1,529 bags from Hambro, 329 sacks 1,153 bags and 83 tons from Rotterdam, and 11 tons from Medemblik. A moderate business is doing, at our quotations:—

York Regents .....	per ton 100s. to 155s.
Kent and Essex ditto .....	95s. 135s.
Scotch ditto .....	90s. 125s.
Ditto Caps .....	85s. 95s.
Middlings .....	60s. 75s.
Lincolns .....	85s. 110s.
Blues .....	85s. 100s.
Foreign .....	80s. 100s.

COUNTRY POTATO MARKETS.—YORK, April 18: We had a fair show of Potatoes, which sold at from 10d. to 12d. per peck, and from 3s. to 4s. per bushel.—LEEDS, April 21: We had a fair show of Potatoes, which sold at 14d. to 15d. wholesale, and 15d. to 16d. per 21lbs. retail.—RICHMOND, April 18: Potatoes 4s. per bushel.—MANCHESTER, April 11: Potatoes 12s. to 18s. per 252lbs.

COVENT GARDEN MARKET.

FRUIT.

Table of fruit prices including Pine-apples, Grapes, Oranges, Lemons, Pears, Apples, Kent Cobnuts, and Strawberries.

VEGETABLES.

Table of vegetable prices including Cabbages, Broccoli, B. Sprouts, Asparagus, Rhubarb, French Beans, Potatoes, Carrots, Turnips, Spinach, Cucumbers, Beet, and Celery.

CHICORY.

LONDON, SATURDAY, APRIL 25.—Our market is but moderately supplied with most kinds of Chicory, in which about an average business is doing, at our quotations. The imports this week are 20 tons.

Table of chicory prices for English, Harlingen, and Flanders.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Table of prices for Butter, Cheese, HAMS, Bacon, and various meats.

ENGLISH BUTTER MARKET.—APRIL 27.

Our trade is slow this day at 4s. to 6s. per cwt. less money for Butter in casks, and 1s. per doz. lower for Fresh Butter.

Table of English Butter prices for Dorset, Ditto, and Fresh.

BELFAST, (Friday last).—Butter: Shipping price, 10s. to 11s. per cwt.; firkins and crocks, 11½d. per lb.; Bacon, 63s. to 68s.; Hams, prime, 84s. to 90s., second quality 70s. to 76s.; prime mess Pork, 100s. per brl.; Pork, 56s. to 61s.; Beef, 100s. to 120s. per tierce; Irish Lard in bladders, 76s. to 80s.; kegs or firkins, 63s. to 70s. per cwt.

LONDONERRY, (Thursday last).—Butter sold fully higher than last week;—firkins, per lb., first 11d. to 11½d., seconds 10½d. to 11d., third 9½d. to 10½d., fourth 8½d., fifth 8d.; butts, fine 11d. to 1s., good 10d. to 11d., middling 9d. to 10d. Pork, 58s. to 60s. per cwt.

HAY MARKETS.

SATURDAY, APRIL 25.—SMITHFIELD.—A full average supply and a sluggish demand. CUMBERLAND.—Both hay and straw moved off slowly, at our quotations.

Table of hay prices for Meadow Hay, Clover, and Straw from various regions.

BARK, &c.

LONDON, SATURDAY, APRIL 25.

Table of bark prices for English, Cork Tree, Valonia, Du. Camata, Du. Moresa, Terra, Japonica, Dry Divi, Myrabolans, and Sumach.

LEADENHALL LEATHER MARKET.

LONDON, SATURDAY, April, 25.—Our market continues to be fairly supplied with most kinds of Leather; and the demand generally is steady, at full quotations.

CROP HIDES.

Table of crop hides prices in English.

BUTTS.

Table of butts prices in English.

FOREIGN.

Table of foreign butts prices.

OFFAL.

Table of offal prices including Cheeks and Faces, Bellies, Middles, Neck, and Dressing Hide Shoulders.

DRESSING HIDES.

Table of dressing hides prices including Common, Do., and Saddle.

HORSE BUTTS.

Table of horse butts prices including English and Spanish.

HORSE HIDES.

Table of horse hides prices including English, Spanish, and Do. do. do.

CALF SKINS.

Table of calf skins prices including Av. weight, Unrounded, Rounded, and KIPS.

SUNDRIES.

Table of sundries prices including Hog Skins, Seal Skins, and Sheep Skins.

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, APRIL 25.

Table of hide and skin prices including Market Hides, Horse Hides, and Shearings.

BIRMINGHAM, SATURDAY, APRIL 25.

Table of Birmingham hide and skin prices including Hides, Calf, and Wool Skins.

FLAX, HEMP, COIR, &c.

LONDON, SATURDAY, April 25.—The Flax market has been very inactive this week, but we have no change to notice in prices. Hemp moves off slowly, at barely previous rates. Petersburg clean £35 to £35 10s., outshot £33 per ton. Jute is 10s. per ton lower; but Coir goods support former terms.

BAMFORD BROTHERS, Brokers.

OIL MARKET.

OILS.		PITCH.	
Olive, Florence, half-chests } £0 18 6to £1 1 0	British (per cwt.) £0 6 9	0 7 0	
Lucern..... } 6 15 0	Archangel..... 0 10 6	0 0 0	
Castor(25gals) 59 0 0	Stockholm..... 0 12 0	0 0 0	
Spanish..... 58 10 0			
Linseed (cwt.)..... 2 0 0	TURPENTINE.		
Rape, Pale..... 2 13 0	Spirits (per cwt.) £1 18 6	2 0 0	
Brown..... 2 10 0	In Puncheons..... 1 18 0	0 0 0	
Cod (cwt.)..... 48 10 0	Rough..... 0 10 3	0 0 0	
Seal, Pale..... 48 0 0	TAR.		
Do. Brown, Yel. &c 41 0 0	American..... £0 18 0	0 18 6	
Sperm..... 93 0 0	Archangel..... 0 18 0	0 18 6	
Head Matter..... 169 0 0	Stockholm..... 0 18 0	0 0 0	
Southern..... 44 0 0	WHALEBONE.		
Coccon-nut (cwt.)..... 2 8 0	Greenland, full } £370 0	380 0	
Palm..... 2 3 0	size (per ton.) } £370 0	380 0	
RESIN.		South Sea..... 0 0	335 0
Yellow (per cwt.) 0 5 9	0 6 6		
Transparent..... 0 5 9	0 6 6		

TIMBER.

LONDON, SATURDAY, APRIL 25.—Several vessels laden with Timber have arrived from the Lower Baltic, and their cargoes have been mostly disposed of on lower terms. Otherwise, the trade is heavy.

Perload—	£ s.	£ s.	DEALS, Yel. Pine, per dressed C.	£ s.	£ s.
Quebec, red pine..... 3 10 4	3 10	6 0	Canada, 1st quality. 15 10 17	0 0	
Yel. Pine..... 3 10 6	3 10	6 0	Do. 2nd do. 11 0 11	10 0	
Quebec Oak, White..... 6 0 7	6 0	7 0	Archangel Yellow..... 29 10 22	10 0	
Birch..... 5 0 6	5 0	6 0	Memel..... 15 10 19	0 0	
Elm..... 5 0 5	5 0	5 0	Gotzenburg Yellow. 14 0 16	0 0	
Dantzic Oak..... 5 0 6	5 0	6 0	Do. White..... 11 0 13	0 0	
Memel Fir..... 3 10 4	3 10	4 0	Gelic Yellow. 14 ft. 30 0 31	0 0	
Swedish..... 2 17 3	2 17	3 5	Christiana, per C. 12 ft. by 3 by 9 in.:		
Masts, Quebec, Red Pine 6 0 9	6 0	9 0	Yellow..... 25 0 30	0 0	
Do. Yellow Pine..... 5 0 8	5 0	8 0	White..... 22 0 26	0 0	
Luthwood, Dantzic Fir 9 10 10	9 10	10 0	Deck Plank, Dantzic, per 40 ft. by 3 in. 1 0 1 10		
Do. Memel..... 9 0 9	9 0	9 0	Staves, per Standard M.: 1 0		
Do. Quebec..... 5 0 10	5 0	10 0	Quebec Pine..... 85 0 90	0 0	
DEALS, per C. 12 ft. by 3 by 11 in.:			Do. Punccheon..... 22 0 24	0 0	
Quebec Wh. Spruce. 10 0 12 10	10 0	12 10	Baltic Crown Pipe. 150 0 155	0 0	
Do. Red Pine..... 11 10 19	11 10	19 0			
St. John Wh. Spruce 12 0 15 0	12 0	15 0			

WOOL MARKETS.

BRITISH WOOL MARKET.

BERMONDSEY, SATURDAY, April 25.—We are at present in a state of suspense, and ignorant of the value of fleeces and fleece sorts, as there is no supply from the farmers, and a very small supply from the dealers; and it may also be said with equal truth that there is no demand on the part of the manufacturers, who are using up their stocks at this dull season of the year, which is between the two seasons that are usually characterized by an active demand for goods. The May series of colonial sales, which commences on the 30th of April, will most likely decide as to whether prices of our descriptions of wool will be maintained or not. But little business doing, and prices nominal.

LONDON, MONDAY, April 27.—As dealers generally are disinclined to become buyers until after the commencement of the Colonial wool sales—fixed for Thursday next—our market is exceedingly heavy; indeed, so little business is doing in it that the quotations are almost nominal. The supply of wool here is by no means extensive, yet town prices are anticipated.

Fleeces—Southdown Hogs.		£21 10 to £22 0
Do. Half bred Hogs.....	19 10	20 10
Do. Kent.....	17 10	18 0
Do. Southdown Ewes and Wethers.....	18 0	19 0
Do. Leicester do.....	17 0	18 10
Sorts—Clothing, picklock..... 22 0 23 0		
Do. Prime and picklock.....	20 10	21 0
Do. Choice.....	18 0	19 0
Do. Super.....	17 0	18 0
Do. Combing—Wether matching.....	23 0	24 0
Do. Picklock.....	19 10	20 0
Do. Common.....	16 0	17 0
Do. Hog matching.....	24 10	25 0
Do. Picklock matching.....	20 10	21 10
Do. Super do.....	17 10	18 10

LEEDS WOOL MARKET, April 24.—Sales during the present week have been limited to a supply of the immediate wants of the manufacturers, and have not been large. Prices are quoted about the same as last week, but where sales have been made the rates have been rather in favour of buyers.

LIVERPOOL WOOL MARKET, APRIL 25.

SCOTCH WOOL.—There is a fair demand for Laid Highland from the trade for their immediate wants, at about late rates.

If any difference, it is in favour of the buyer. White Highland is in fair demand. Cheviots and Crossed is, however, in more limited demand, and do not maintain late rates.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs.....	16	0	17	0
White Highland do.....	18	6	20	0
Laid Crossed do. unwashed.....	18	0	20	6
Do. do. washed.....	20	0	21	6
Laid Cheviot do. unwashed.....	23	0	26	6
Do. do. washed.....	23	6	28	0
White Cheviot do. washed.....	32	0	40	0

FOREIGN WOOL.—The near approach of the sales here to commence on the 29th instant, as well as those of London on the 30th, has tended for the moment to check business by private contract, but as they are all working on light stocks, there does not seem much chance of any great alteration in price.

LEEDS FOREIGN WOOL MARKET, April 24.—The announcement of the public sales somewhat earlier than was generally expected has had the effect of checking the demand, and until it has been ascertained whether or not any reduction in prices will take place, there will probably be no improvement.

BRESLAU WOOL REPORT, April 2.—If business in the first days of the last two weeks had been very insignificant, owing to the interceding holidays, it became the brisker towards the end of the closing month, attaining almost its former extent, and embracing chiefly the better descriptions. The whole amount of sales arises to nearly 1,200 cwt., consisting for the greater part of Silesian Fleeces, at from 96s. to 106s. per cwt.; ditto skin-wools in bundles, 88s. to 96s.; ditto slipes, 76s. to 86s.; fine Polish and Posen one shearing, 85s. to 92s.; Russian scoured, 110s. to 115s. Besides a number of home manufacturers and dealers, as well as Berlin and foreign commissioners, we had some French manufacturers in the market, who, visiting for the first time our place, availed themselves of the present extraordinary choice of fine Wools at the current comparatively advantageous prices. In the mean time there has been exhibited a greater activity in the dealings on contract, and a great many flocks of fine and middle fine quality have been acquired on the sheeps' back, most part at the average prices of last year's spring fair. In general business is in a very healthy state, as millers at the actual moderate rates of the rough material, and the high value of woollen manufactures, are enabled to work with good profit, which situation has been recently still fortified by the favourable result of the last Leipzig cloth fair.—GUNSBERG, Wool Broker.

MANURES.

PRICES CURRENT OF GUANO, &c.	
PERUVIAN GUANO, (per ton, for 30 tons) nominal	£13 5 0 to £0 0 0
Do. Do. (under 30 tons).....	14 15 0 15 0 0
BOLIVIAN GUANO.....	12 0 0 12 10 0

ARTIFICIAL MANURES, &c.		£ s. d.	£ s. d.
Nitrate Soda } £19 10 0 to £20 0 0	Sulph. of Copper or Roman Vitriol, for Wheat steeping.....	42 0 0	43 0 0
Nitrate Potash } 29 0 0 30 0 0	Salt.....	1 5 0	2 0 0
Sulph. Ammonia 17 10 0 18 10 0	Bones, Dust, per qr. 1 5 0	1 6 0	
Muriate ditto..... 22 0 0 23 0 0	Do. 3-inch.....	1 4 0	1 5 0
Superphosph. } 6 0 0 0 0 0	Oil Vitriol, concentrated.....	0 0 1	0 0 0
of Lime.....	per lb.....	0 0 1	0 0 0
Soda Ash, or Alkali.....	0 0 0	8 0 0	
Gypsum.....	2 0 0	2 10 0	
Colpomite.....	3 15 0	4 0 0	

OIL-CAKES.		£ s. d.	£ s. d.
Linseed-cakes, per ton—	Marsilles.....	19 0 0 to	£0 0 0
Thin American, } £9 10 0 £10 0 0	English.....	10 0 0	0 0 0
in brls. or bags	Rape-cakes, pr ton	6 5 0	6 10 0
Thick do. round	8 10 0	9 0 0	

JOHN KEEN, 35, Leadenhall-street, (Late Odams, Pickford, and Keen.)  
 Williams & Co., 24, Mark Lane—Azotic..... per ton £8 0 0  
 Manufactured by Hodgson & Simpson, Wakenfield, and Matthews & Co., Driffield..... per ton £8 0 0  
 Ammonia-Phosphate and Nitro-Phosphate..... per ton £8 0 0  
 Superphosphate of Lime..... per ton £7 0 0

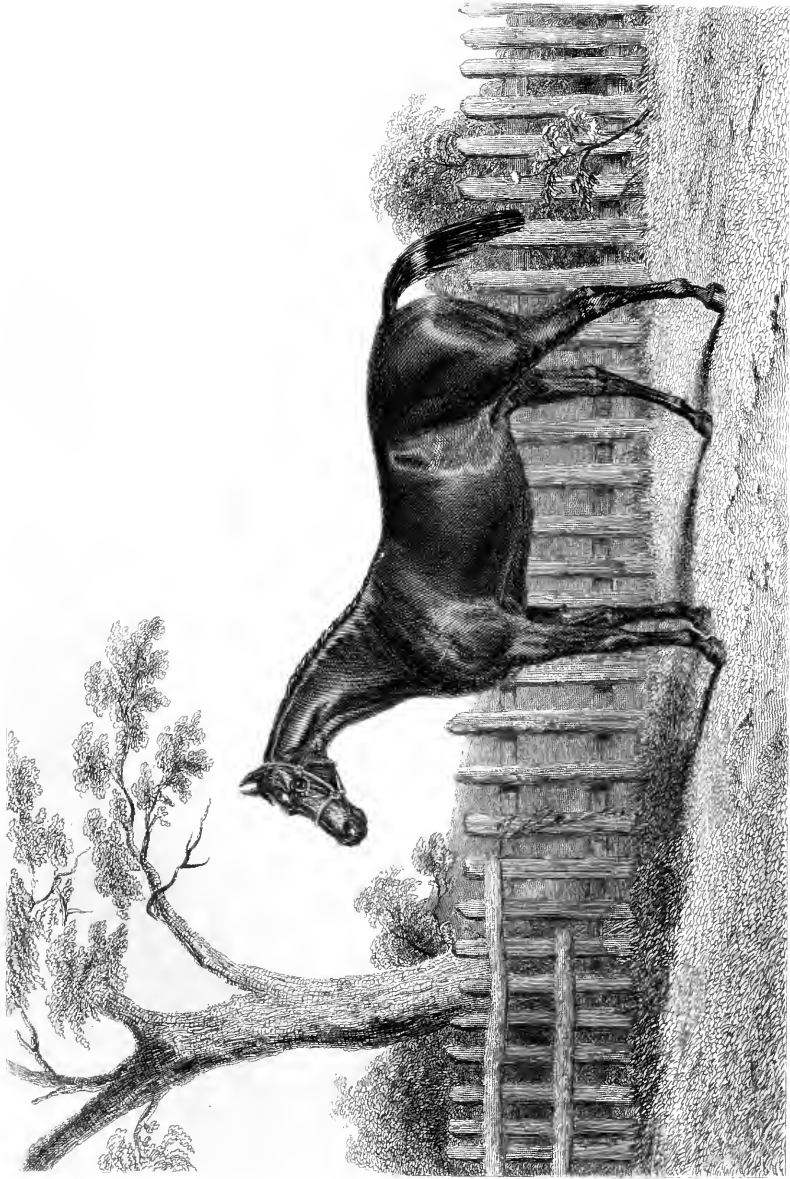
Agricultural Chemical Works, Stowmarket, Suffolk.  
 Prentice's Cereal Manure for Cereals..... per ton £8 10 0  
 Prentice's Turnip Manure..... „ 7 0 0  
 Prentice's Superphosphate of Lime..... „ 6 10 0  
 Lancashire Manure Company, Widnes, near Warrington.  
 J. Knight & Co.'s Nitrogenized Bone Manures..... per ton £8 15 0  
 Manure Works, Grovehill, Beverley.  
 Tigar & Co.'s Celebrated Turnip Manures..... per ton £7 10 0











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# THE FARMER'S MAGAZINE.

JUNE, 1857.

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## PLATE I.

### A SHORTHORN OX,

THE PROPERTY OF MR. RICHARD STRATTON, OF BROAD HINTON, SWINDON.

This famous white ox, bred by Mr. Stratton, and calved the 2nd of February, 1853, was by Mr. Stratton's Clarendon (12605), dam Marcia by Kenilworth (7118). Clarendon himself won no less than fourteen premiums, amounting in all to £150.

In December, 1856, at the Gloucestershire Agricultural Association this beast took the prize of Six Sovereigns as the best fat steer of any breed.

In the following week, at Birmingham, he took the first prize of Ten Sovereigns as the best of his class, with the Silver Medal to the breeder, and the Gold Medal as the best ox or steer of any breed or age in the Exhibition.

In the week after this, at the Smithfield Club Show he took the first prize of Twenty-five Sovereigns, with the Silver Medal to the breeder.

At the Poissy Show in April, 1857, he took the first prize of Forty-eight Sovereigns, with another Gold Medal. He was sold here for the butcher for sixty-eight sovereigns; at Birmingham, in December, eighty sovereigns having been refused for him.

This was altogether a very capital ox, and in almost every respect quite a first-class animal. He had an extraordinarily full and prominent breast, deep girth, chine rather plain, shoulder well-formed and admirably thrown out. His loins were rather high; but he had a good, full, fat purse. His girth was 9 feet 1 inch, and his estimated weight at Christmas 22 scores a quarter.

Mr. Stratton, the breeder and feeder of this ox, has long been distinguished as one of the most celebrated and justly successful of our short-horn men. Indeed, as a public exhibitor of the sort, there are few that can vie with him. In a career of fourteen years he has taken four hundred premiums, amounting in hard money to near upon three thousand pounds, in addition to seven Gold, and fourteen Silver Medals.

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## PLATE II.

### "A BRITISH YEOMAN."

A British Yeoman, bred by the late Mr. Blakelock in 1840, is by Liverpool, out of Fancy, by Osmond, her dam, sister to Countess, by Catton, great grandam by Hambletonian—Shuttle—Drone, &c.

Liverpool, by Tramp, dam by Whisker, out of Mandane, by Pot-S-o's, ranks as one of our very best stallions. In addition to the Yeoman, he is the sire, amongst many others, of the following well-known winners:—Lanercost, Calypso, Broodwath, Lady Liverpool, Wce Willie, Naworth, Malvolio, Messmate, Queen Bee, Moss Trooper, Bee's-wax, Sir Abstrupus, Espoir, New Brighton, Everton, Hippora, Isabella, Full Sail, Jamaica, Mocha, Panther, Plantagenet, Brush, and Princess Alice.

Fancy, the dam of A British Yeoman, is also the dam of Commodore, his full brother, sold by Mr. Blakelock to the late Duke of Cleveland for 3,000 gs., and never beaten.

A British Yeoman is a brown horse, standing sixteen hands high. He has a remarkably good head,  
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a thin, muscular, and bloodlike neck, and a firm crest. He has a compact body, well ribbed up, with immensely powerful hind-quarters, famous hocks, and good, broad, well-shaped feet. He stands a little over from age and work, but is still a most magnificent horse. When stripped and brought out, as we saw him at Chelmsford, what with his beautiful coat, grand way of showing himself, and fine symmetry and power, he is about as attractive a specimen of the thorough-bred horse as it would be possible to find. Honestly, the portrait hardly does him justice.

A British Yeoman was put to the stud in 1845, and that very year we find him taking the premium for the best thorough-bred stallion shown at the East Cumberland and Westmoreland Society's Meeting, held at Carlisle. Since then he has been awarded similar prizes:—at Carlisle, in 1846, given by the East Cumberland Agricultural Society; at Appleby, in 1848, given by the Cumberland and Westmoreland Society; at Carlisle, in 1849, by the East Cumberland Society; at Carlisle, 1851, by the East Cumberland Agricultural Society; at Cockermouth, in 1851, by the Cumberland and Westmoreland Agricultural Society; the East Cumberland Agricultural Society in 1853; at Carlisle, in 1856, by the East Cumberland Agricultural Society; and the Royal Agricultural Society at Chelmsford, open to all England, and the East Cumberland, in 1857.

As a stud horse, A British Yeoman may be estimated equally well by his stock. At the great Agricultural Meeting at Carlisle, two of his produce out of the seven shown took first prizes, while, as we wrote at the time, a "more promising lot from one horse has seldom been brought together." A British Yeoman himself only stood second here to Ravenhill, but the whole entry of thorough-bred horses was very good. This included The Era, St. Bennett, and The Cure. At Chelmsford the show was not so strong, and the Yeoman had it all his own way. He is, perhaps, more particularly famous as a hunter-stallion, but the following winners are enrolled in the calendar to his credit:—Blood Royal, British Farmer, Bourgeois, Brother to British Farmer, Bridekirk, Baroda, Coomburland Stathesmon, and Little Jack. Of these, Bourgeois has proved himself a very useful nag, having, up to the end of last season, won no less than nineteen times.

A British Yeoman is the property of Messrs. Moffat. He visits during the week Carlisle, Penrith, Wigton, and Aspatria. His price for thorough-bred mares is five guineas, and half this for half-bred ones.

## ROOT CROPS.

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

In the last number of this valuable magazine, I endeavoured to show the important use which might be made of the atmospheric air in increasing the productiveness of our soils. It is far from improbable that at no very distant period the surrounding atmosphere will in this way be brought still more into the service of the farmer. If so, we shall have another instance, amid many, of the advantages, in such practical efforts, of following in Nature's footsteps, watching her proceedings, and promoting her marvellous manipulations.

When we are thus glancing at the powers of atmospheric air to sustain vegetable life—when we are detecting the mode in which one of its gases supplies the growing plant with its carbon, another with its oxygen—when we find in the ammonia which that atmosphere contains one perhaps chief source whence the same plant derives its nitrogen—while engaged in such rather startling reflections, may we not, in this month of turnip-sowing, profitably ask ourselves if the atmospheric gases are the only main sources whence our crops derive these

matters of their purely vegetable portion? if water, for instance, does not perform as highly important a part, and whether those services might not be rendered more extensively and generally useful? And if such should prove to be the fact, we have here a source of fertility whose powers are, like the gases and vapour of the atmosphere, well worthy of a more extended practical examination. In this time of turnip-sowing, then, let us examine together a few facts which serve to illustrate the results obtained from enlarged supplies of water to turnip-lands. We are all aware that the turnip will bear a more considerable amount of moisture than in our climate usually falls to its share. We find, in fact, that in the moister climate of Scotland much greater weights of turnips are raised on a given extent of land than in England, and that too in a mean temperature rather lower than with us. The report of the Lockerbie Farmers' Club indicates this clearly enough. They give in their report (*Trans. High. Soc.*, 1856, p. 231), the average weight of turnips per imperial acre produced

during the seven previous years on thirty farms of the district of Annandale. This was in tons and cwts. as follows :—

	Swedes.	Yellow.	Common.
1849 .. 21	16.....20	10.....22	7
1850 .. 24	9.....19	14.....25	14
1851 .. 19	19.....17	0.....21	1
1852 .. 23	7.....17	7.....33	14
1853 .. 21	19.....23	4.....27	3
1854 .. 20	8.....18	13.....22	0
1855 .. 24	7.....20	17.....25	12

To produce these large crops, the skilful farmers of Dumfriesshire employed no other means to ensure success than such as are commonly adopted by the best English farmers; they used the same kind of dressings, farm-yard dung, Peruvian guano, crushed bones, and superphosphate of lime—grew the same varieties of the turnip; and yet in what equally extensive English district can we find an average produce of either swedes or ordinary turnips equal to those on the thirty Dumfriesshire farms? We must seek, then, in the greater moisture of their climate for an explanation of the sources of the Scotch farmer's greater success. Now, of the comparative extent of that moisture, the rainfall tables give us considerable information. The table I will here refer to is that by Mr. H. Allnutt, and from this we find that in the turnip-growing months of 1856 (a period unusually dry in that year, I believe, for Scotland), the following was the average English and Scotch rainfalls given in inches and tenths of an inch :—

	May.	June.	July.	Aug.	Sep.	Oct.
England.....	3.0	1.6	1.9	2.9	3.5	2.4
Scotland.....	2.5	3.2	2.2	3.0	4.3	1.4
Difference in fa- vour of Scot- land .....	0.5	0.4	0.7	0.3	1.2	1.0

On another occasion we noticed the good effect produced on well-stirred soils by the free and copious introduction of the insensible moisture of the atmosphere, and it is probable that more water might be profitably added by artificial means to many turnip soils than we are always ready to believe. The water-drill in this way promises well, and at this opportune season I should be glad to find that more extended and varied trials were made with it. In the trials of Mr. Chandler only about two tons of water per acre were used; the result was very decidedly in favour of the water-drill. It is true that two tons of water are only equal to a depth of about 0.02 of an inch per acre; but then, from the mode of applying the water down the drill coulters, *under the surface* of the soil, protected from the sun and wind, such an amount is probably as powerful in its effects upon the young turnip-plant, as a shower of rain twenty times its weight, which merely in a dry period

moistens the *surface* of the land. The effect of adding a larger proportion of water per acre would probably be much more considerable, and I feel this conviction, although I am aware that Mr. Chandler (*Jour. Roy. Ag. Soc.*, vol. ix., p. 522) tells us that in the same year he employed (with crushed bones) both two tons and four tons of water per acre, and that he found "no perceptible difference" in the produce from employing two tons and four tons of pond water in his drill. He finds that with three water barrels, two on the road, and one filling (which may be accomplished with two horses), water sufficient for a one-horse drill to put in five acres per day can be brought the distance of a mile. It is certain, however, that the beneficial effect of thus applying water is not entirely owing to the mere amount of water added to the soil, but that much benefit is also derived from the soluble portion of the manure being in this way more immediately diffused through the soil, and rendered available for the roots of the plant. The advantage of even so small a weight of water as that applied by the drill is not confined to the turnip crop. A fen farmer, Mr. A. Rushton, of Chatteris, has published the results of his trials in 1854 and in 1855 with mangold wurtzel, turnips, and cole-seed. The result per acre of his trials in 1854 will be found in the following table. The seed was sown in April, and the mangold roots were weighed in October, 1854. The soil is a light sand, and on such soils the ridge system will not answer :—

	Manure.	Water-drill.	Dry-drill.	
		tons. cwt.	tons. cwt.	
1½ cwt. superphos. of lime	{	20	16....15	9
16 loads of dung .....				
1½ cwt. superphos. of lime	{	20	19....15	16
16 loads of dung .....				
1 cwt. superphos. of lime	{	17	7....13	15
12 loads of dung .....				
1 cwt. superphos. of lime	{	13	19....10	8
13 loads of dung .....				
Turnips.				
2 cwt. superphos. of lime	{	16	10....12	7
10 loads of dung .....				

In 1855, in his trials with mangold, 13 loads per acre of farm-yard dung were added, except on No. 5, which had only 10 loads :—

Sown.	Drill.	Sup. Phos. Cwt.	Produce. tons.	cwt.
1. April 26 .....	Water..	1½.....	18	2
	Dry....	1½.....	8	10
2. „ 25 & 26.	Water..	1½.....	19	2
	Dry....	1½.....	13	15
3. „ 24 & 25.	Water..	2 .....	19	2
	Dry....	2 .....	12	15
4. „ 21 .....	Water..	1½.....	27	5
	Dry....	1½.....	16	10
5. „ 27 & 28.	Water..	1½.....	30	0
	Dry....	1½.....	20	13

Again, in January, 1856, he observes, "I have found the water-drill simple, easy of management, and highly advantageous. The colesseed put in by it appeared four or five days earlier than those drilled dry, with a much fuller and more level plant. It secures, too, an equal distribution of the manure. In dry summers and soils it frequently occurs that there is not sufficient moisture in the soil to dissolve the manure; now the artificial manure being put into the cistern of the drill with the water is rendered much more beneficial, because its most fertilizing portions become quickly dissolved, and in consequence you have a rapid early growth of the plant, for its action upon it is immediate." There are certain variations in the mode of applying the water by different drills. In the drill of Mr. Spooner, the water and the manure are delivered down separate channels, with great neatness and success. On his own land, in 1855, he grew 28 tons of mangold wurtzel and 12 tons of carrots per acre, in alternate rows, from seed put in with his water-drill, at one operation, with water and dry artificial manure, without the use of any dung whatever.

Upon the whole, we may fairly conclude that the result of these trials give every reasonable assurance that the application of water with the manure-drill is likely to be productive of very good results in the cultivation of root-crops. It is also reasonable that by the application of manures in this way, there will be considerable saving in the expense of manures: rather less proportions may very probably be employed; for it is certain that by applying fer-

tilizers in a state of solution, they are more readily mixed with the soil, and are moreover presented to the roots of the growing plant in the only form in which they can be absorbed. That small additions to the soil are productive of very considerable results, is shown in the case of other supporters of vegetable life, as in the instance of ammonia and other soluble manures. In the case of ammonia, for instance, 100lbs., added to an acre of soil which weighs 4,000,000 lbs., would only increase the amount of its ammonia by 0.0025 per cent., or about 1 part in 40,000, and yet every farmer is well aware that by such a small addition to the majority of soils, their productiveness is very largely increased. We may hence, perhaps, draw the reasonable conclusion, that as small additions of certain substances to the soil are found thus largely to add to their productiveness, so it may be found that the application of a very moderate amount of water to the land, in the way I have been tracing, may yield much greater results than we might have been inclined to expect after we have learnt the large proportion which is ever present in all cultivated soils. The suggestion of these kind of inquiries will be the more readily entertained when we are, as at present, experiencing rather a deficient supply of certain artificial dressings, such as guano and superphosphate of lime. It is then indeed that we feel the most decidedly the advantages of strengthening our supplies from sources which, in the cases of the atmosphere and of water, are ever ready for our use, and silently render, or proffer services of which we are only now beginning to understand the value.

## GUANO—ITS COMPOSITION—AND THE AVAILABLE SUBSTITUTES.

What shall we do for guano? From the replies to some questions lately put to the Government in the House of Commons, it appears that there is little to be expected from that quarter. The question having been asked whether Her Majesty's Ministers intended to send out some small vessels of war for the purpose of searching the rainless coasts of Africa, and some other localities, for supplies of guano, Sir Charles Wood replied in the negative. Orders, he said, had been issued in 1844, again in 1852, and 1853, to the commanding officers on the different stations, including the west coast of Africa, to take every opportunity of ascertaining whether any guano, or places where guano was likely to be found, existed on the coasts visited by them. A variety of reports had been received, but he was sorry to say there was nothing satisfactory in them as to the existence of guano in any great quantity, or of any great value. He took this opportunity, he added, of answering another question which had been put on the paper by Mr. Caird, viz., whether a search for nitrates and guano,

or other sources of manure, formed part of the instructions to the naval officers at present engaged on the survey of the coast of Egypt, the south-east coast of Africa, and the south-west coast of the Pacific, and the River La Plata, the cost of all which surveys was included in the estimate? The answer to one part of the inquiry had reference to physical geography, the knowledge of which renders a search for guano hopeless in some of the quarters referred to. There was no hope, he said, of guano being found on the low-lying shores of Egypt, or the shores of La Plata. The survey of the south-east coast of Africa was a mere land survey, but with respect to the coast of the south-western Pacific, orders had been given to the surveying officers in that quarter to ascertain, if possible, the existence of guano. These disappointments will not, however, have been without their use, if they only teach us to utilize instead of wasting our home supplies of guano, and to economize what we import. With regard to the last point, there is scarcely one



speaker in the discussions which have taken place on this subject, who has not frankly declared that the facility with which guano has been obtained, had led to a wasteful use of it, which he exemplified by reference to his own practice. In the course of our experience, we have found the same to prevail with respect to mineral manures. If they are near the surface, and on the farm itself, they are used in large quantities: if there is a deep cover to be removed, or they are burdened with distant carriage, the opinion prevails that small dressings of them often repeated do the most good. The importance attached to guano has its advantages and disadvantages. The latter consist in its letting those who possess a virtual monopoly of guano into the secret of its importance, and setting all the world to draw on a limited supply. The advantages will be somewhat similar to those described in the fable of the dying farmer, who desired his sons to dig over a certain field for a pot of gold buried there. They did not, as is well-known, find the gold, except in the abundant produce of grain which the digging produced.

Let us consider what guano is; for we often appear to lose sight of that. In the first place, then, it is the dung of birds; and, secondly, it owes its value to the large quantities of phosphates and ammonia which it contains, in consequence of their feeding on fish; and, thirdly, from the liquid and solid excrements being united in the dung of birds. Have we no dung of birds at home? Have we no supply of phosphates and ammonia, in fish and fish-refuse, now wasted? Have we no streams of human guano, in the sewage of towns, turned into our rivers to pollute them, or going to be turned into the sea to be wasted?

In a recent article we adverted to the lecture given by Mr. Ferguson, at Newcastle-on-Tyne, and his plan for applying the sewage of that town to the improvement of the soil, together with the favourable reception the plan experienced from his audience—awakened to the importance of the subject by the falling-off of our guano supplies. On the present occasion let us direct attention to the two former sources of supply from which home-made guano may be obtained, namely, the excrements of birds, and the phosphates and ammonia contained in fish and fish-refuse.

First, as to birds. The value of bird-dung was well known under the old common-field system of husbandry, when dove-cotes were more common than at present, and the lord of the manor was privileged to keep pigeons, to be fed by his neighbours. Happily the number of these strongholds of winged free-bootery has become greatly diminished. The keeping of poultry for sale has likewise greatly diminished as the size of farms has increased, the occupiers of which seldom keep more poultry than is required for their own consumption. This is a favourite grievance with those who declaim against the large-farm system, which, whether for good or for evil—for good, we believe, in some respects, for evil in others—has extended, is extending, and will extend, in Great Britain and Ireland. The cheapness of poultry in Ireland used formerly to be a favourite source of declamation with the grum-

blers of the school we have alluded to. It was, however, a cheapness dearly purchased by the evils which attended it, and which the failure of the potato is clearing away. The decline of poultry farming may be traced to the fact that land, labour, and capital, applied to the rearing of beef and mutton, makes better returns than when employed in the rearing of ducks and fowls, geese and turkeys. Nevertheless, there is a certain amount of poultry kept on most farms. What becomes of their dung? In most cases—and, we are free to confess, this was the writer's own practice—it is wheeled out to the dung-heap, there to undergo the usual washing process, with the accompanying discharge of its phosphate and ammonia into the ditches, where they betray their presence by the luxuriant growth of the grass and weeds which they produce.

The farmers of the old school, whether for better or worse—now nearly extinct—allege that “the new lights,” as they call them, only do in a dear way, by means of their expensive drains, what they effected at a much cheaper rate. This reminds us of another home-source of phosphates and ammonia which we had nearly overlooked, namely, the husbanding of that which now escapes through our drains. Let us pass this over, however, for the present, without inquiring how much of this waste arises out of the new doctrine of the percolation of water through homogeneous clay; confining ourselves to the question of our poultry and their droppings. Why should not that source of manure be economised? Why should it not be preserved, to be drilled, mixed with ashes, charred peat charcoal, or even loam, which the farmer not unfrequently buys in his artificial manures? For those who like the water-drill better than the dry-drill, why should not the manure of the hen-roost be dissolved, and administered in that form? The quantity of phosphate and ammonia derivable from that source may not be considerable, but there is the old Scottish proverb about “littles and mickles;” and the profits of farming, we are told, depend entirely on attention to minutiae, which is the reason gentlemen farmers are generally so unsuccessful. Then, again, there is pig-dung. Oh, but pig-dung breeds nettles! There cannot be a stronger recommendation, for nettles are a sign of richness in the land. Pig-dung affords the prospect of a large supply of home-made guano. We have lately met somewhere with a statement made by a farmer of how he saved the dung of his pigs separately, mixed it with ashes, and converted it into a drill-manure equal to guano. There cannot be the least doubt on this point; and that there are many ways of economizing pig-muck without putting the pigs on boards, which, if we rightly remember, was the practice in the case to which we allude.

We have got to the end of our limits, and have yet to enter on the fish part of the question, together with the guano resources of that description now wasted round our coast.

## HOW CAN THE THAMES BE PURIFIED ?

One of the most important questions to be solved at the present time, as well as for the future, is, "How can the Thames be purified?" That it must be cleansed of the foul pollutions which are daily, nay hourly pouring into its streams, is admitted by every person. The health of this vast metropolis requires it; and the only point which demands consideration, and to which the attention of the scientific mind is at present directed, is, how can it be best accomplished? Now if we look at the matter in a sanitary point of view, another question arises, even before the foul contents of the sewage drains of the wilderness of London houses arrive at the mouths of the sewers, and that is, does the effluvia which is discharged from the excreta, as it leaves our dwellings, return to us again with disease and death in its train? or does the foul matter drag its slimy length for miles through a sewer, and only give its foulness at the mouth? There can be little doubt but that not only are our houses poisoned by the present drain system, but that wherever there is an opening into our streets to carry off the surface-water, there also is cholera and fever making its escape, and disseminating their contagions to the surrounding neighbourhoods; and if they are close and badly ventilated, then do we hear of "infected lanes and dwellings." The Registrar-General, in his report of the state of the public health of the metropolis, on the 16th of August last, after describing the inhabitants as not being in an average state of health, gives as one of the causes—

"The third class of atmospheric impurities is invisible, but it arises from the long retention of the excrement of London under the houses and in the sewers. According to the estimates of Mr. Lewis, London could supply the farmers of England daily with 29 tons of ammonia, 51 tons of carbon, 14 tons of phosphates, 32 tons of mineral matter, and 14 tons of other matter; making in the aggregate 140 tons of dry manure, dissolved naturally in about 19 times its weight of water. The country requires this precious manure, which London is anxious to get rid of at any reasonable cost, as it is now known to be as insalubrious as it is offensive."

And here this valuable public officer puts the question, and that to the point:

"The problem for the engineer to solve is, how can 3,000 tons of town guano be returned daily to the disinfecting soil, from which it was chiefly taken, with the least offence to health and with the least cost? Shall it be distributed by pipes or by railways? shall it be disinfected by water, earth, ashes, or any chemical compound?"

"Under the present arrangements some hundreds of thousands of tons of this matter lie in store in London, putrefying in cesspools, and percolating the streets, while the residue is thrown into the Thames at a great cost."

The problem to be solved is this—"How can the refuse of our houses be preserved in a deodorised state, containing all its gaseous constituents, yet capable of being manipulated as a manure?" Could this problem be solved, what a blessing to the crowded population of our cities!—what a boon to the agriculturists of our country! We believe that the attempt to collect the filth at the sewers' mouth, as they exist at present in London, and there convert it into a manure, will not pay. It loses its fertilizing powers in passing through our sewers, by emitting, in its journey along, those fertilizing gases which constitute its value; but if these can be retained, and the refuse be produced in an inoffensive mass, capable of being packed in bags, and thus

removed, such invention will amply repay those who can carry it out.

And now let us examine the question in a plain straightforward manner. What are the substances which give guano its high fertilizing and commercial value? It is the phosphates and the ammonia it is capable of supplying. The phosphates exist in the manure in two conditions, viz., in a condition in which they are capable of being dissolved by water, and of being immediately taken up by the plants; and in a state in which, like the phosphates of bones, they are only by slow degrees rendered soluble when mixed with the soil. Now, what are the constituents of human excreta as a manure? It contains the phosphates of ammonia, lime, magnesia, soda, and iron; the chloride of sodium and alkaline sulphate; the sulphates of lime, soda, and potash; the hydrochlorate of ammonia and other animal matter, mucus, and earthy phosphates. It is impossible to conceive anything richer for the essentials of vegetation, and yet hundreds of thousands of tons of this manure are annually wasted before our eyes in London alone.

We have before us a pamphlet entitled "Facts and Fallacies of the Sewerage System of London and other Large Towns; with Plans, Elevations, and Sections, &c., &c.," by Jasper W. Rogers, C.E."; a perusal of which we recommend to all those who have given this question, in all its branches, any consideration. Mr. Rogers proposes to convey by a house refuse main pipe the excreta from the water-closets to an air-tight chamber, to be built at the mouth of each of the sixty main sewers of this metropolis. The result would be, that whilst travelling through this closed pipe the soil would remain almost in its original state, and when it arrived at the filtering chamber it would possess all the components required by vegetation to make it luxuriant, but one—carbon. In this chamber, a section of which is given in his work, divisions are made which contain charcoal; and through a body of this material the waste water is filtered into the river as pure as when it first left its mountain stream, leaving the mass of humus at the bottom of the air-tight chamber. He then proposes, by means of an Archimedean screw, to raise the solids thus left to an intermixing machine, both being worked by a small fixed steam-engine, where a sufficient supply of peat charcoal (the carbon wanted) would deodorize the mass, and give as "human guano" a powder fine and perfectly inodorous—fit for being transported in bags, and as a manure fully equal to guano.

In confirmation of the above, we quote from the *Morning Chronicle* of October 3rd, 1849, the report of a meeting held at the Mechanics' Institute, Southampton-buildings, Chancery-lane, on the previous Monday, and the following took place:—

Night-soil and peat charcoal were then passed through a mill of simple construction, in which they were thoroughly mixed, the result being a dry blackish powder, not unlike the peat charcoal in appearance, and giving out a faint ammoniacal smell, which almost instantly passed off, leaving the poudfrette inodorous and capable of being handled and carried about without any inconvenience. \* \* \* The operation having been repeated, the same results followed, and within a few minutes the whole quantity intermixed was carried off by the audience, who came from all parts of the theatre to take it in *handfuls*. A few minutes before, all noses were turned away from the tin buckets in which the night soil was brought: a few minutes after, it was taken up in *handfuls* and put into paper-bags provided, and

"stowed away," possibly in the same pocket with the pocket-handkerchief.

Some six hundred persons attended the meeting, and a certificate of the extraordinary effects of the peat charcoal on the night-soil was signed by A. King, M.D., M.R.C.S., &c., 24, Lower Calthorpe-street, Guildford-street; John Lyon, Secretary of King's College Hospital; Samuel Griffith, M.R.C.S., &c., 1, Bloomsbury-place; D. Walker, M.A., F.G.S., F.S.S., &c., Head Master Agri. Col., Maidstone, Kent; John C. Nesbit, F.G.S., F.C.S., &c., 33, Kennington-lane, London; Geo. Garrett, Commissioner of Paving, &c., 130, Jernyn-street; H. Nesbit, Winchester-house, Old Broad-street, City; countersigned by chairman, W. O. Young, Sun-court, Cornhill.

If we doubt the powers and value of peat charcoal itself as a manure, we have the evidence of a well-known writer on agriculture as to its efficacy. Mr. Cuthbert Johnson says—

"The peat charcoal of Ireland, which is now, thanks to the energy and ability of Mr. Jasper Rogers, finding its way into the London market, appears to offer a supply to the farmer of the most extensive kind, and at a reasonable rate. The chemical operation of charcoal, when used as a manure, either in its simple state or when mixed with decomposing matters, in the way to which we have alluded, is not generally understood. That the carbon of the charcoal operates so beneficially upon plants, among other modes, by a gradual combination with oxygen, hardly admits of a doubt. Charcoal, too, absorbs both the ammonia of decomposing animal substances and the minute portion found in rain-water. It also absorbs, and stores up, as it were, for the service of vegetation, the gases of putrefaction; by this means purifying and sweetening, as the housewives say, any tainted substances with which it is mixed."

Professor Johnston, in the "Transactions of the Highland and Agricultural Society" for 1846, page 190, gives similar evidence.

But far above the writings of theorists is the attestation of facts by men whose rank and station in the agricultural world place them far and away from the suspicion of being influenced by aught save the good of their country and the well-being of the class to which they are attached by interest and profession. John Hudson, Esq., of Castle Acre, one of the most extensive agriculturists in this kingdom, on the 5th of December, 1850, gave the following result of a trial of charcoal manure in comparison with others on the same land.

WEIGHT OF SINGLE RODS OF SWEDES, TOPPED AND TAILED.

	No. of		
	Turnips.	st.	lb.
From peat charcoal manure, 23 tons 11 cwt. per acre....	44	8	0
	45	8	0
	40	7	0
	129	23	0
From rape-cake, 20 tons per acre....	54	8	0
	52	8	0
	33	4	0
	139	20	0
From Lawes' manure, 23 tons 11 cwt. per acre .....	48	8	0
	45	8	0
	47	7	9
	140	23	9

COST OF MANURE PER ACRE.

Lawes' manure .....	25s.
Rape-cake .....	22s.
Peat charcoal manure .....	12s.

So far all would seem to work-out an answer to the question with which we commenced this article. Next comes the main question, How is this to be effected? To expect that the Metropolitan Commissioners will lay down pipes from the several houses at a cost of a couple of millions of money, even supposing they were promised that the outfalls would be rented to carry out Mr. Rogers' proposition, is out of the question. We wish that gentleman had proposed a solution in his pamphlet; but he leaves us to find out that ourselves. It is an ascertained fact, that the sewage as it runs at present from the sewers is almost valueless as a manure, the cost of deodorizing it even by recent discoveries being more than the value of the product. What then do we propose? Simply this. Let a company be formed; let them take any one of the great sewers, and let them lay down pipes from all the water-closets connected therewith, to communicate with a chamber at the outfall: a few thousands will effect this. It is proposed at present by our great engineers to expend some five millions in building a sewer at the expense of the inhabitants of London, to carry away the sewage and waste it in the German Ocean; and we believe it is yet a question whether such an outfall could be effected as would answer this purpose, and perhaps, after all this money was expended, this immense sewer, in some centuries hence, may become another great wonder of the world, and, like the Pyramids of Egypt, the question might be disputed for what purpose it was made. If millions are to be spent, we say, let it be in a mercantile undertaking which will repay the outlay with interest. We are now arguing on the supposition that Mr. Rogers' project would succeed. Let then a company be at once formed, with a capital of not less than £3,000,000, in 1,000,000 shares of £3 each. Let the deposit be only one shilling per share, which is to be the only and final call until the question is solved. This will give £50,000; quite sufficient to test the experiment. Let the one sewer be tried—the pipes laid down—the airtight chamber formed at its mouth, the engine affixed, and the whole process get a fair trial. But above all, as this company would save the citizens of London the sum of £5,000,000, or perhaps double that, let the Legislature pass a short Bill, at their own cost, giving the company a lease for ever of the outfalls of London, in consideration of their purifying the River Thames. If the company succeed, what would be their profits? Assuming the Registrar-General's statement to be correct, we should have 3,000 tons of manure per day; but let us take it at half that amount, and reduce that half again to allow for exiccation; allow also for the additional weight of charcoal, and we must have, at the least computation, 1,000 tons of dry manure per day; or, in round numbers, we will say 350,000 tons per annum. If we say that this would produce in the market £5 per ton, which is its present minimum value, it leaves the enormous gross return of £1,750,000 per annum. This may appear fabulous, but we must recollect that the London General Omnibus Company receive, according to their own published returns, nearly £700,000 per annum in threepences and fourpences. But we wander. Of this sum of £1,750,000, suppose we take off £750,000 for expenses, which would exceed the maximum expenditure calculated by railway authorities; yet we still have left one million per annum to pay dividends on three millions expenditure, or 33 per cent. return.

## THE COTTON TRADE—AND HOW IT MAY BE EXTENDED.

The supply of fibrous materials for our manufacturers, so as to keep the great industries of the country actively engaged, is a question of great importance, and one occupying a large share of attention at home and abroad, among numerous classes of producers and consumers. A deficiency of the raw material for our mills, our paper manufactories, and our rope walks is of vital interest to the wellbeing of many branches of trade and to large masses of our work-people.

Unfortunately there is a listless apathy among merchants and manufacturers, from which they only arouse when a deficiency of import begins to stare them prominently in the face. They are not prudent enough to look a-head, and watch the gradual extent of the production and increasing demand, nor to ascertain what is doing in consumption and manufacture in competing countries.

Cotton is a necessary element of our trade progress, for it forms in its manufactured state one of the largest items of our exports, and yet we find the demands of the manufacturers for cotton wool increasing far beyond the ratio which the imports should show. Dependent as we are chiefly on the United States for the bulk of our cotton, the Manchester mill-owners find to their surprise that the Continental States and the American union are now very large consumers, using up a much greater portion of cotton than formerly. Indeed, if this foreign demand progresses at the same rate, many of our mills will be stopped for the want of the raw material.

But it is not only of cotton, but of various other fibres that our supply is inadequate to the demand of the manufacturers, and the enlarged wants of purchasers and consumers. We could use much more flax and hemp, for which, notwithstanding the extension of production in Ireland, we are still good customers to Russia. Thus far in the present century we have taken from Russia about three millions and a-half tons of flax and hemp, worth at the least one hundred and sixteen millions and a-half sterling, and although we pay her fully three millions a year for these staples, yet she takes but little of our produce in return.

Our own foreign possessions could supply us with very much more in the way of fibrous substances. From India we are beginning to receive more cotton; and jute is now a very important article of commerce from thence, the supply having trebled within the last three years, the imports in 1856 amounting to 36,000 tons. This fibre now supplies the manufacturers of Dundee with two-thirds of their raw material. Being very low-priced, it can be employed economically for many purposes. It is mixed with the cotton warps of cheap broadcloths and with silk, and from its glossy

lustre can scarcely be detected; and it is also woven into cheap carpets. Of Manila hemp, as it is erroneously termed, a product of the wild plantain, we now import about 5,000 tons. Strenuous exertions are making to bring plantain fibre into more extensive use, by increased supplies and improved preparations; and there is little doubt these will ultimately be successful, the more especially when we consider the immense return it gives per acre. While cotton yields only about 150 tons to the acre, and flax, hemp, and jute from 300 to 400 tons, the plantain furnishes upwards of 3,000 tons of fibre of different kinds to the acre, of which more than two-thirds is of a very superior quality, and adapted to many textile purposes. The aloe, the hibiscus, the reha, and very many other Indian and tropical fibres, have scarcely yet been tested to any extent; but the collection recently introduced and sold by the East India Company proves what an undeveloped mine of wealth remains to be explored in useful fibrous materials adapted to the wants of commerce.

Another fibre to which attention has occasionally been drawn for its usefulness, cheapness, and tenacity, is the New Zealand flax, or *Phormium tenax*, a monster species of iris, the leaves of which are often from 8 to 10 feet in length. This plant grows indigenously and abundantly throughout the whole of the New Zealand group and Norfolk Island. It flourishes best in valleys and low marshy situations, but also grows in high rocky soils, and thrives on the sea-shore within the influence of the sea spray. It is of a hardy character, and has been introduced and succeeds well in Ireland, the west coast of Scotland, and the Channel Islands. The Americans, too, have recently been experimentalizing on its culture in the Mississippi valley.

Many years ago the New Zealand flax was cultivated in France, and the fibre was known as *soie vegetale*: bell-ropes, cords for window-blinds, handkerchiefs, and other manufactures of a silky appearance and most pleasant wear, were made from it. In the New Zealand islands it is so plentiful that 30,000 acres of the wild flax have been repeatedly met with at one spot, and by culture the plant is necessarily improved.

About two years ago, Mr. Wynyard, the Superintendent of the Province of Auckland, directed public attention to the value of this plant to the colony of New Zealand, and suggested to the consideration of the Legislative Council whether any and what pecuniary inducement should be held out for the discovery of a process by which the flax could be prepared, so as to be made largely available as an article of export from the province. This suggestion seems to have been taken up; for we notice an announcement in the New Zealand Government Gazette, of the 20th of December last,

offering rewards of £2,000, £1,000, and smaller sums, to the extent in all of £4,000, for the manufacture of 100 tons of New Zealand flax for export. The expense of preparing the fibre has hitherto been the great obstacle. By the rude native process of scraping the leaf, not more than 10 to 12 per cent. of clean fibre is obtained; but by machinery from 30 to 50 per cent. can be procured, and two men could very easily prepare a ton or more per day of very superior fibre. The successful employment

of proper machinery would furnish the New Zealand flax-dressers with almost inexhaustible supplies of a material admirably adapted for the manufacture of not only canvas and cordage, but of linen, cambrie, paper, and other textile fabrics.

We hope to see much more attention paid in all our colonies to the production of fibres, which would form a most remunerative staple, and for which there is always a ready market.

## THE INDUCEMENTS FOR BREEDING GOOD STOCK.

It has too long been notorious that, as a rule, the breeding of stock is sadly neglected in this country. And this in the face of every encouragement to give the pursuit more attention. Beyond what the home market may do in finding a customer, the export trade in cattle and horses has for years been a very profitable business. If a good horse, sheep, or bull, of almost any kind, is wanted, it is to Great Britain you must come for it; just as you would go to Paris for fashion, or to Italy for art. Other States, however, carefully cultivate what they excel in; whereas we do not. A man with the best of means and opportunities at his command is quite as likely to breed a bad animal as a good one; and while pedigree, either for horse or beast, is fetching its price, the chances are that his stock will have no pedigrees whatever. The occupation has thus been suffered to centre comparatively in the hands of a few. Our neighbour in the next parish or county has "a name" for this sort of thing, and with him accordingly are we content to leave it. A visitor, to be sure, may come from America, Australia, or the Continent, for a taste of the blood, and make it worth the journey to do so. But we should not. It certainly costs just about as much to keep an inferior beast as it does a better one; still we do not seem to care much about it. And hence, up to this very hour, England continues in so anomalous a condition that on one homestead you shall see a herd or a flock as generally good as that on the next is unequivocally bad.

It is time all this was corrected. Indeed, one would have supposed that the experience of the last few seasons alone would have done far more to improve us than we fear it really has. If a man would only go to Howden or Horncastle, and mark the avidity with which good horses of all sorts are bought—if he will only listen to the figure at which "the glass runs" for a short-horn heifer, or the bidding going on for a South-down ram, he ought to be able to make some profitable deduction. Of course every one cannot expect to be a Jonas Webb or a Richard Booth. These, though, by this, have their cotemporaries, and with what effect? Is the grand business already over-done? Is the cream of the thing gone? Are the foreigners satis-

fied? Not a bit of it. Stock and sheep are selling better than ever. The export trade is rapidly extending. Where one good animal was wanted a few years since, there are twenty such wanted now. There is plenty of room still for improvement, put the point which way you will.

A prudent man will naturally look a little before him; and when he sees a stranger, the American agent, or Australian settler, giving any price they like to name or run him up to, he will likely enough ask himself how far he would be justified in doing this? Such prices sound somewhat ephemeral and artificial; and there is little question but that it would be wild work to depend on them. On the other hand, we must repeat there is now a good certain market for well-bred animals of every description. If a breeder have anything like fair judgment and success, he may be sure of very advantageous returns for his additional care and outlay, even from the custom of his own country. This commences as it should do, with the higher classes. The landlords of this kingdom, we are happy to say, are giving more and more attention to the selection of good stock. Within this day or two it has been our lot to see two or three noble lords keenly contesting the possession of the same cow-calf. It strikes us, too, that, as owners of the soil, there are few ways in which they could be better employed. Amongst the first of the duties of a country gentleman's life we might instance such as these. Let him take care to provide a good, well-shaped, well-bred bull or two; with a thorough-bred, as well as with a cart stallion, and he may soon stimulate a tenant into something better. There are many such who only want a little rousing; and let them just once get a good Marmaduke calf, or a promising Cotherstone colt, and they will take kindly enough to it of their own accord.

We say again, there is every encouragement for breeders to persevere and to study more this especial branch of rural pursuits. On Monday, May 18, Messrs. Tattersall sold, at Hyde Park Corner, whole strings of hunters at high prices. One for 560 guineas, another for 340 guineas, a third for 270 guineas, the next for 260 guineas—250 guineas—240 guineas, and so on. And this, recollect, at the end of a season. On Friday,

Mr. Wetherell, at Bushey, got 500 guineas for one bull, 400 guineas for another, 400 guineas for a third, and 150 guineas for the next of the same herd; while the previous day, at Dudding-hill, Mr. Strafford made 200 guineas for one cow, and 150 guineas for another, with 60 guineas for her calf of not quite a day old! The competition for all these was chiefly confined to English breeders; the averages, as will be seen from our reports, were very good, while we are glad to find the names of some of our practical farmers registered amongst the buyers of such stock as that of Mr. Bolden, Mr. Majoribanks, and Mr. Grenfell. This is coming to what we want.

There has long been an opening for some such a

metropolitan depot of stock as that to which the Dudding Hill Farm is now converted. We have, indeed, heard of more than one project of the kind being in contemplation. The sale, however, on Thursday, May 21, would appear to have at once stamped this as being in every way what was required. Those who, like ourselves, had any previous knowledge of the premises will remember that they came almost ready made for the purpose. At such a time, the week or so before or after Epsom, when everybody is already in, or coming up to town, it would be impossible to imagine a more convenient place of sale; and cattle ought to go as well at Willesden as horses do at Hyde Park-corner.

## THE GREAT AGRICULTURAL SHOW AT VIENNA.

The Grand Agricultural Show at Vienna commenced on Saturday, 9th of May, in the Imperial Garten Leopoldstadt. This was the 50th anniversary of the show; and though considerable interest had been excited by the appeal of the Austrian Government to foreign exhibitors, there was no more display than though it had been an ordinary circumstance, and not an effective effort of the Agricultural Society of Vienna. A simple placard on the gate of the principal entrance to the garden was all that was deemed necessary to inaugurate so great an event; and had not a couple of officials demanded payment for entrance, there was nothing to indicate that business had really commenced, but that the proceedings were of a purely preliminary character. Nevertheless, the show was of a highly interesting nature, and cannot fail to have an important influence upon the agriculture of the country. The Imperial Government is now evidently alive to the value of agricultural improvement, and is using its best endeavours to develop the resources of the different portions of the empire. Our Great Exhibition of '51, not forgetting the services of the Royal Agricultural Society, was the first demonstration to foreigners of the necessity of improved culture of the soil, and that science can be as effectively applied to the production of food as to the manufacture of clothing. England set the example, the Exhibition of Paris followed in the wake, and now we have the show at Vienna, and another announced to commence a month hence at Pesth, which promises to be the most important of all, that city being in the very centre of the largest cultivators in the empire. Agriculture may, therefore, be said to have assumed its legitimate position in the estimation of the more civilized portions of Europe; and when the spirit which was first awakened amongst ourselves shall have made its tour through the various states which stand much in need of its visitation, we may hope to find a great and accumulating improvement in the physical and social condition of the general labouring community, and, indeed, of all classes of European society.

It would, probably, be impossible to find a more ap-

propriate site for an agricultural show than the Imperial Garden at Vienna. At the end of the main entrance is the Conservatory, which forms one side of a spacious quadrangle; this was principally devoted to the raw produce, such as specimens of flax, silk, wool, tobacco in leaf, hemp, seeds, plants, roots, wood, &c. Cheese, butter, honey, wines, flour, fruits, diges, beer, all in singular variety, were also there, and many of them of the choicest quality. On the left of the Conservatory the horticultural productions were shown in an elegant wooden structure, built for the occasion. Fancy, however, would be exhausted in attempting a description of even a tithe of the exquisite flowers that met the eye at almost every turn; we shall, therefore, leave that task to its appropriate sphere of description. The immediately opposite side was appropriated to Austrian implements, which were of the worst possible character; and terminating these was the covered space of the Marquis de Bryas, one of the old French noblesse, an amiable enthusiast, who exhibited a great number of orders, and gave away books upon drainage, which he alleges to be the great panacea of all our social evils.

On the right and left of the main entrance to the garden, in a large open space, the cattle sheds were commodiously arranged; and as they were open at the sides, the animals had a chance of breathing a somewhat freer atmosphere, than the "chosen few" of their bovine brethren had at the Paris show of last year. The horses, a new feature at exhibitions of this kind, were also in appropriate stalls at the end of the cattle-sheds. The fowls—unworthy of notice, except a couple of turkeys—the pigs, and the sheep, were in what may be called the garden. We shall, however, reserve our remarks upon the live-stock, as they were too important in character and kind to be disposed of in a single paragraph: the same observation will apply to the raw produce.

The garden is mainly composed of spacious avenues of sycamore trees, and others whose leaves are of a lightly-tinted emerald, arranged with almost mathematical precision; and between these are wooded spaces,

intersected with paths which communicate with the main avenues. At this season, the bloom being in its fullest and freshest nature, the whole garden assumed a most agreeable character, and afforded a grateful shelter to the great bulk of the exhibitors and visitors.

In the main avenue, flanked by these tall and umbrageous sycamores, the steam-engines and thrashing-machines of the English exhibitors were ranged; and being mostly kept in motion, they formed a strongly picturesque and animated feature of the show. The crowds of visitors, wondering at the perpetual puff, and the whirring wheels of the engines, and the endless hum of the machines, were for the most part perfectly aghast; and even those who had been partially accustomed to such displays expressed themselves greatly surprised, as they wandered along the line of the locomotive-thrashers, at the high finish of the workmanship, at the mechanical perfection which almost all displayed, and at the precision with which the work apportioned to each was accomplished. On the right of this attractive line of machinery, the English implements were ranged, intermixed with a few of continental manufacture. The bulk of the latter, however, were placed on the opposite side of the garden; and we must say that they exhibit much improvement since our last visit to Austria, although the greater portion of them are still rude and imperfect, the best being copies of our standard English implements, and a few even of American. To the most casual observer, however, it was apparent how very far behind the continent is, in the excellence of manufacture, and in cheapness of production, when compared to ourselves. Consequently English implements and machinery of a superior class have been for some time imported into Austria—principally to Hungary—and their marked superiority has led to a general desire for the relaxation of the high duties imposed upon importation. Already, indeed, the duty has been reduced about one half; but it still ranges from 8s. to 10s. per cwt., and nothing but the most urgent necessity for effective machinery for labour would lead to importation at all. Messrs. Clayton, Shuttleworth, and Co., for some months past have sent two or three steam thrashing-machines per week; and the ploughs, harrows, and rakes of Messrs. J. and F. Howard are well known, and beginning to be extensively used in several parts of Hungary. The stands of these two firms in the Exhibition, therefore, naturally attracted a good share of attention from the visitors—especially those who had an eye to business, and were largely interested in the improvement of agriculture in their respective districts. Messrs. Garrett, also, have for some time been large exporters of implements to Hungary. The demand for English machinery in the Austrian dominions awakened attention to the high duty, and led to a deputation from the leading exhibitors amongst our countrymen to Sir H. Seymour, who entered most patiently into the question, and promised to use his best endeavours to forward their views. Another reason, also, suggests itself at the present moment for urging this question. The agriculture of Hungary differs from that of Eng-

land, not only as regards its primitive character, but from the fact that the land is all held by large proprietors, such a race as tenant-farmers being unknown there until within the last ten years. Mr. Smallbones, of Oxfordshire, who went to Hungary as steward to Prince Esterhazy some few years ago, has introduced the English system of farming there, by inducing the Prince to let certain portions of his large estate to tenants of capital; and this, as far as it has gone, has worked very well. The example has been followed to a small extent by other proprietors; but, though the advantage is manifestly great, the national pride of these proprietors in having all the land in their own hands still prevails, and has hitherto prevented its general adoption, coupled, perhaps, with the difficulty of finding fit men to take it. What we have seen, however, of the country, justifies the belief that it opens up a fine field for our enterprising agriculturists at home, the land being of the richest description, and to be hired at a very cheap rate. Let our readers note this fact.

Farms in Hungary vary from 5,000 to 100,000 English acres in extent. The field-work is performed principally by bullocks, yoked at the forehead. The implements in ordinary use are few, and of the rudest character. The only preparation of the soil for corn in the south, on the alluvial soils, is made by harrows, formed of black-thorn bushes, tied to the tails of Hungarian ponies, which are driven rapidly backward and forward across the land to scarify the surface. The corn is then put in broadcast of course, and is weeded by women and children, who perform this labour without pay, their remuneration being the weeds thus gathered, which serve as food for the pigs. It was not uncommon, some few years since, for the proprietors, after raising a crop, to allow the land to lie fallow for five years together, being satisfied with depasturing it with sheep.

The abolition of the *robot*, or peasant-tenure of land in Hungary, which dates from the Revolution of '49, has created a great change in the agriculture of the country. The landholder is now obliged to pay for the labour employed, which has forced his attention to labour-saving machines; hence the demand for better implements, and the adoption of a more advanced system of farming, though the bulk of farmers, much against their ultimate interest, regard this change with anything but favourable views. Formerly the peasant held his land principally upon two conditions: he made certain payments in kind, and performed certain services for the benefit of the proprietor, and was saddled with all the claims (except military service) of the State upon the land. Preceding the adoption of the *urbanium*, in 1791, the peasant was, in fact, *adstricti glebae*. For example, the holder of *sessin*, or farm, had attached to his dwelling one *joch* (one-and-a-half English acres) of land for his own use, the right of pasturage on the common, and was allowed sufficient wood for fuel and for building purposes. In return for these concessions, the peasant gave the landlord fifty-two days of labour with a team of horses or bullocks, or one hundred-and-four days' labour without a team; he also gave one-ninth of the produce of the

land, and paid a quit-rent of one florin for his house. With slight variations, this was the general tenure of the holdings throughout Hungary; and it is scarcely necessary to remark, that the cultivation of the soil was of the most backward state.

On the day the Emperor visited the Exhibition, the scene was strikingly picturesque. The uniform of his Majesty and his attendants, the costumes of the peasant exhibitors, especially those from the Tyrol, from Bohemia, and from Galicia, a great portion of the engines and machinery in full motion, the crowds of visitors, many of whom comprised the *élite* of Vienna Society, and the universal demonstration of respect with which the royal party was received, formed a scene as singular as it was interesting. On the Emperor's approach to the English quarter of the show, our countrymen collected in a group, and gave his Majesty a round of good hearty cheers, which, though apparently startled at first, he received with the most grateful tokens of recognition. Another circumstance, also connected with the English exhibitors, is worthy of attention—both employers and employed abstained from attending on the Sunday, which had its due effect upon the minds of the crowds of visitors, whose religious feelings were not of so scrupulous a character.

As the English manufacturers responded to the appeal of the Austrian Government to furnish objects to the Exhibition with their accustomed enterprise, the show of implements and machinery was exceedingly good, not only as regards quality, but quantity also. Most of the leading firms sent large contributions, and, although the distance is upwards of 1,200 miles, and the obstructions of transit great, they have every reason to congratulate themselves upon the result, as the greater portion have taken large orders, and are likely to receive still larger at the approaching show at Pesth, from the circumstance of that locality being in the centre of the richest agricultural districts of Hungary. Messrs. Clayton, Shuttleworth and Co., Messrs. J. and F. Howard, Ransome and Sims, Hornsby and Sons, Garrett and Sons, Barrett, Exall, and Co., Coleman and Sons, Snyth, Turner, Smith and Ashby, W. Dray and Co., were particularly conspicuous in the variety of the objects they exhibited, and also in most instances in the high finish and mechanical excellence of the work in each object. Burgess and Key brought their improved Mc Cormick's reaper, with which, however, they refused to compete, not considering the *green rye* a fair test of the capabilities of a reaping machine. They also exhibited Parkes's forks and draining tools. The Reaper attracted a good deal of attention, and had the honour to defile before the Emperor. The foreign contributions were principally from Berlin, Prague, Dresden, and several from Vienna and the Austrian territories; but all, with scarce an exception, seemed to belong to another generation, and were not even worthy or capable of enduring a comparison with those of the English exhibitors. The copies from the latter were, in a few instances, however, creditable.

#### THE TRIALS.

The trials, if such a term may be applied to the several essays made by the machinery, the thrashing-machines, the ploughs, cultivators, and reapers, was simply a demonstration of the working capacity of the English contributions, and involved no particular interest beyond that of the wonder and astonishment of the spectators, not accustomed to such marvels in mechanical construction. Each of the thrashing-machines had fifty sheaves of wheat assigned them, which they knocked off in about six minutes on the average; and although little or no preparation had been made, they all did their work in a most effective manner, and to the evident surprise of the great body of the visitors. It is, however, but right to remark that the corn was thin and poor: had it been finer and plumper in condition, the machines would have appeared to much greater advantage.

The implements were tried on a piece of land in the village of Florisdorf, about 5 miles distant from Vienna. The soil, however, was of too light a character to exhibit the peculiar excellence of the English implements generally; nevertheless great interest was excited, and a large crowd of spectators bore testimony to the desire of seeing them more generally used in Austria, and especially in Hungary.

Baron Ward, whose political career in Parma is known to our readers, tried his reaper upon a piece of green rye; but the result was anything but satisfactory, although the machine had the aid of four strong men to assist it. Dray's reaper followed, and, though forced to run on the standing rye—from the circumstance of the ploughs cutting the land close up to it—did its work in a highly creditable manner. The impression made upon the spectators, who had an immediate interest in the essay, was very marked, as the reaper is in great request in Hungary, the plains of which are well adapted for its use, while a large quantity of corn is annually lost from deficiency of labour requiring its peculiar aid.

The live-stock and the raw produce, which are singularly rich and varied, we shall notice next communication. We must here, however, express our thanks to Mr. Nangle, a gentleman who has long been resident in Hungary, and who held the position of interpreter and general manager at the show, and whose conduct elicited the uniform approbation of the English exhibitors.

No official list of the awards had been published when our reporter left Vienna, but we shall of course take care to give this as early as possible.



## A HISTORY OF PRICES AND THE STATE OF THE CIRCULATION DURING THE NINE YEARS 1848-1856,

We have recently received two volumes of a work of considerable public importance at the present moment, namely, the fifth and sixth volumes of "A History of Prices and the State of the Circulation during the nine years 1848-1856"; by Thomas Tooke, F.R.S., and William Newmarch. The high public character of these two gentlemen is a guarantee for the care and attention that have been bestowed upon this elaborate compilation.

Two events have transpired in the last ten years, which, from the universal influence they exercise over the trade and commerce of Europe—we might say the whole world—will beyond a doubt be pointed at as forming an epoch of momentous importance in the history of prices. The first of these is the adoption of free trade by the British Parliament, a measure which has yet to receive its full development. The second is the discovery of the gold fields of California and Australia, by which the supply of gold in Europe has been more than tripled. It is therefore at a most opportune time that these two volumes have made their appearance.

In order to form any correct idea of the probable effect of the enormous influx of gold into Europe during the last ten years, we must refer back to the period of the discovery of America and the gold and silver mines of Mexico and Peru. Before that event, the supply of the precious metals in Europe was very small indeed, probably not exceeding, in gold and silver, three millions per annum. It must be recollected, too, that there were no banks, and consequently no paper circulation at that period; the quantity of specie in circulation, therefore, was necessarily all that the people had to depend on for a medium of exchange in commerce, and prices were proportionately low. For instance, in the fourteenth century a grass-fed ox was sold for 16s., and a corn-fed one for 24s., a three-year-old hog for 3s. 4d., and a shorn fat sheep for 1s. 2d., &c. In the following century the entire expense of a dinner given by the "Worshipful Company of Waxchandlers" amounted to only 10s. Wheat was frequently as low as 2s. 6d. per qr. in a plentiful year, although in seasons of scarcity it was extravagantly dear. But after the discovery of the Mexican and Peruvian gold and silver fields, the influx of these metals into Europe, according to Humboldt, amounted to nine-and-a-half millions sterling per annum; that is, in 356 years, from 1492 to 1848, the entire quantity poured into Europe was 3,204 millions sterling. Mr. Tooke makes it only amount to 1,813 millions, which is perhaps the custom-house return. But it is well known that nearly half the amount obtained never passed the Spanish custom-houses at all, but was smuggled out of the country by the direct connivance of the officers appointed to prevent it; so that

the official returns were no criterion whatever of the real quantity raised.

The effect of this increase of the precious metals upon prices was immediate and permanent; and we find that the average value of wheat and other grain acquired a fixity or steadiness of price never known previously. Instead of averages of 1s. 6d., 3s. 1d., 13s. 3½d., 15s., and 11s. 9d., which had been the former rates, we find they soon rose to 34s., 39s., 44s., 51s., and so on, per qr.; and but for the civil wars which prevailed at short intervals, there would have been but little fluctuation in prices, except in cases of deficient harvests. Judging therefore by analogy, we have from the first discovery of the gold fields of California, and subsequently those of Australia, looked for advancing prices of all kinds of produce, nor have we been disappointed. According to our authors, the quantity of gold since imported into Europe—say in nine years, from 1848 to 1856—has amounted to 174 millions, or upwards of 19 millions per annum on the average, the last year (1856) bringing it up to 32½ millions.

Now, it is morally impossible that such an additional supply of gold, any more than that of any other commodity, can be thrown into the commerce of Europe without producing an effect upon prices. It may be alleged that it has not such an effect because it does not remain in this country, but passes over to the continent. The operation upon prices, however, is not less certain, and the process by which it is effected is perfectly simple. For instance, the gold received from Australia represents the goods (manufactures) sent out to pay for it; for we can only buy in proportion as we sell, or sell only in proportion as we buy. The manufacturing of those goods employs an extra number of hands, and, moreover, yields the operatives remunerative wages. This creates an extraordinary demand for all the necessaries of life, and that demand occasions advancing prices. To be convinced that such is the actual operation of the influx of gold, we have only to look at the enormous increase of our exports in the Board of Trade returns, and then at the state of the manufacturing districts. For the last four years we have, from one cause or another, had extraordinarily high prices for all kinds of agricultural produce, notwithstanding that for three years at least we have had full average crops of wheat. Still, with these high prices, we have heard no complaints from the operatives in the manufacturing districts, nor has the consumption at all diminished in consequence, but rather the contrary. The fact is, the production of gold has furnished full employment for the manufacturers at remunerative wages, and they have not felt the high prices oppressively.

With respect to the disappearance of the gold as soon as it arrives—as we are circumstanced, this is of no vital importance. Were we, like Austria or Spain, destitute of public and private credit, it would, indeed, be a heavy calamity—not being able to retain it. But, whilst the credit of England—both public and private—continues intact, we do not want the gold. Any man would rather have a Bank-of-England note for £1,000 in his pocket than a thousand sovereigns; and, provided he has gold or silver enough to make his minor payments, it is far more convenient either to hold or pay, or carry about, notes or bills than cash. We, therefore, without any misgivings, receive the gold from the diggers, take the profit upon it in the shape of manufactures in the first instance, and in the second of the extra prices for produce occasioned by the extra demand. We then pass the gold to our needy neighbours, at a profit upon the import price. This we conceive to be the simple working of the influx of gold from California and Australia. We see the proof of it in the increased price of meat, butter, cheese, and, above all, corn of every description, and, lastly, of *land*, as a natural consequence. If other productions of an exotic growth—such as tea, coffee, rice, &c.—have not advanced in proportion, it is because the supply has increased with the demand, so that no room existed for a rise in price.

We have thought it right to commence our notice with these explanatory remarks, fully borne out by the work before us, in order to show the importance of the two events which are now, and have been since 1848, in operation upon the prices of the necessaries of life; and at the same time to point out to our readers the value of the publication Mr. Tooke has produced, and which we now proceed to notice more particularly.

It is impossible to give even a slight analysis of a treatise containing upwards of sixteen hundred pages. We shall, therefore, take a glance at the several divisions of the work, which consist of seven parts:

1st, A narrative of the seasons, and of the state of the corn trade, 1847-56.

2nd, On the general course of trade and prices in the markets for manufactures, and for commodities other than corn.

3rd, On the progress and effects of the railway expenditure, and of the railway system as now developed.

4th, On the progressive application, from 1820 to the present time, of the principles of free trade to the commercial legislation of this and other countries.

5th, On the management and policy of the Bank of England during the period 1844-56.

6th, On the policy pursued in France, since 1847, relative to finance and to banking and credit institutions.

7th, On the order, extent, and character of the changes which have been produced by the new supplies of gold from California and Australia.

To these is added (Appendix 2), an inquiry relative to the influx of the precious metals in the sixteenth and seventeenth centuries.

Part I. is divided into 32 sections, the first seven of which, after the introduction, exhibit a detail of the meteorological phenomena of each month and year from 1847 to 1853, showing the influence of the weather

upon the prices of wheat, as affecting both the amount of produce and the quality. This was particularly the case in 1852-3, in which season not only was a large breadth of land unsown that should have been cropped with wheat, but the excessive wetness of the time, from September to May, injured the plant to such an extent, that not more than four-fifths of an average was produced, whilst the deficiency in the breadth sown raised the actual deficiency of the crop to one-third of the usual average. The following year was as productive, both from the extra breadth sown as from the extraordinary yield, as the previous one was defective; but the influence of the latter upon prices still continued. We notice that the month of May, 1854, was dry and cold, with easterly winds until the 22nd, and the foliage of the trees was greatly injured, yet no mischief was sustained by the wheat crop; and we refer to it as forming a counterpart to the present month, so similar in its features.

During the nine years (from August 5th to August 5th) from 1845-6 to 1853-4, the quantity of wheat entered for consumption amounted to 40,258,000 imperial quarters, or an average of 4,473,000 qrs. per year. Different reasons are adduced by different persons for so large an importation; but we cannot stop to state them, and must refer the reader to the work for information. One thing, however, is specially noticeable, namely, *that the whole, or nearly so, was consumed up to the harvest of 1854*; and, that notwithstanding the largest crop that ever was reaped, there was no great surplus left at that of 1855, the effect of the wet weather of 1852-3 having thus spread itself over a series of several seasons, and is, in fact, felt in prices to the present time.

We pass on to section 15, "On the relative productiveness of the harvests in England during the forty years 1815-1854, and on Mr. Jacob's researches in 1826-8." This is an interesting portion of the work, and contains valuable information to the merchant as well as agriculturist. Sections 18 to 23 treat of the vexed question of statistics; and the failure of Government to establish the principle, Mr. Tooke very properly ascribes to not confining their inquiry to the quantity of the land under tillage and in pasture in the first instance, which would not have alarmed the agriculturists or given them the idea of a "troublesome, vexatious, and alarming inquisition" into their private concerns. "It is exceedingly desirable," says Mr. Tooke, "that the breadth and species of culture should be ascertained; and means will probably be found of accomplishing that object. But the 'Estimates' of produce proposed by the bill could scarcely be expected to answer any useful purpose."

Section 26, "On the import of foreign grain during the 35 years 1821-55, &c., &c.," will be found important; as well as sec. 29, "On the probable future range in this country of the prices of corn," &c., and sec. 30 and 31, "On the character of the seasons and harvests 1855-56, and the prices and estimated produce of wheat. Section 32 is a summary of conclusions, &c., from which we select the following as peculiarly important: "16.—That as this country under the existing system of free-trade is open to importation from all the corn-exporting countries in the world, and is equally free to export to all ports abroad which are open to imports of foreign supplies, it is clear that the prices of the United Kingdom, allowing for expenses and delays of transits, *must be European prices*; or rather *prices of the commercial world*." Mr. Tooke might have added, that the effect will be greatly facilitated and promoted by the operation of the electric telegraph.

We shall hereafter resume our observations upon these important volumes.

## REARING AND TRAINING COLTS.

I have of late noticed in your paper a number of views in relation to training colts, and if the subject is not already exhausted, I will cast in my mite with the rest.

Commencing at the foundation: select just such a mare for breeding, as above all others you would prefer to use yourself; sufficiently compact to keep easy, and perfectly sound, wind, limb, and body—without fault or blemish. If you have a mare that has any faults or blemishes, and wish to try her as a breeder, do so. If her colts prove number one, keep her; if not, let her pass into the hands of dealers in second-hand horses. If your mare is mild and tractable, as she should be, she might be judiciously used (not driven too fast,) until three weeks before foaling. I have worked them to within two days without injury. If work is an important part, let them foal about 1st of June; then you can work them at your spring farm work until middle of May, when they should be turned out to grass.

In selecting a sire, choose one of good size, all other things being equal; every one hundred pounds above one thousand, added to the weight of a good three or four-year-old colt, will add 5 gs. to his selling value; but know that he is sound every way; round proportions, that will keep easy, broad between the eyes, a show of courage, with an inviting, intelligent countenance. Let his pedigree be good, and find it out. If he is advertised for what he is not, that is, with a design to deceive in pedigree, reject him, even if he is the best horse you ever saw, and tell the owner plainly the reason—that honesty will answer your purpose, and a forged pedigree will not.

Now, presuming you have a good colt, do well by him the first winter; the second and third winters he will bear coarse keeping as well as any stock you have. Should not approve of too much straw, and sheep and oxen orts; coarse hay fodder will do; and if the colt gets thin there will be no permanent injury, provided his hair keeps a thrifty look; he will come up in four weeks at grass. Always give good pasturing in summer. Summer feed is too cheap to keep any stock short.

Halter-break any time from three weeks to three years old, as you find for your convenience. Take him into a small yard free from stone; put on your halter, one he cannot break; take a small stick in your hand, that he may be afraid to jump on you; be gentle, and not frighten or hurt him. If the colt runs back, follow him; you can run forward

as fast as he runs back. If the colt runs forward, hold on; do not rub, but pull him round; a man can pull round a large colt; do not get behind him, but keep at the side; learn him to lead by pulling sideways; in that way you have the advantage; he will very soon follow you around, and soon after that forward.

In hitching, hitch in a way they will not be tempted to pull, and continue it. Hitch them in the stable with a few oats or some good hay in the manger, or hitch to the old mare's neck, with not more than one foot of slack halter. Be gentle, and your colt will be halter-broken in less time than I have been writing how to do it.

Now allowing the colt is well halter-broken, and has come to the fall or winter past three years old, and is in good spirits and good condition, put on your bridle; buckle it rather tight on the top of the head, as that will draw the bit so far into the mouth as to prevent their throwing the tongue over the bit. Let them stand with a bridle on some two or three hours at three or four different times. I have known colts with a loose bridle, and put at once into the biting-machine, to throw the tongue over the bit and ever after carry it there; and if they carry the tongue over the bit, they will be most likely to carry it out of the mouth. Put on your biting-machine; draw your colt's head in but little at first; turn him into a yard where the fence is smooth, that his bridle may not get caught. The colt may be bitted some half-a-dozen times—two or three hours at a time—drawing his head in a little more each time, but never unnaturally close, or so as to sore his mouth in the least. If he begins to sweat and becomes very uneasy, you may conclude he is too tightly bitted and should be released. The reason why I should wait till the fall or winter after the colt is three years old, before beginning to break, is, that I should never commence to break before the colt is old enough to work, and all the work a colt does before that age will be done at the expense of his growth; besides, at and after that age, a colt will bear considerable strain and effort without affecting his shape or future good; while, previous to that age, some uncalled for effort in breaking may for ever affect his goodness.

If you wish to teach him to follow you, now is the time; it can be done in half-an-hour while he is in the bit. If you have always been gentle with him he will not avoid you, but come up to you, and, by rubbing against you, indicate that he wants the bridle off. Get a few oats in a measure and a stick in your hand, shake the measure that he may hear the sound of the oats, and say "come here." When he has eaten a few oats, raise up your stick and go away from him; keep your stick in a way that he will not dare come very near for fear; then put down your stick, shake your measure, and say "come here," and you will see him coming. When

he has eaten a little, raise up your stick and drive him away; when he shows a disposition to come back, drop your stick, exhibit your measure, and say "come here;" you may start and walk off—he will be at your heels. You may now practise with your oats and without, as you find necessary; he will understand your language if he is not hurt or scared.

Now if you wish to ride him with the least trouble, take him into the stable, shut the door, hitch in the stall (presuming it is not less than five feet wide, and ten feet in the clear overhead), lay your breast upon his shoulder, next jump so that your body will lie across him; do so several times; now bring yourself around astride him; get off and on as many times as you please; now open the door, unhitch your colt, and ride where you please. If he is not inclined to stand for you to get on, make him stand while you get off and on two or three times before starting. Now put on an old harness, hitch him in the stable, with the traces tucked through so that they will dangle about his hind legs, and let him stand some three or four hours; then take him out, and either lead or drive him in the harness, enough to feel that he is not to be hurt. If you have a steady horse it will be the least trouble to put your colt in at the side of it; but if not, turn your waggon or sleigh into fair sailing; let some one take the colt by the head while you hitch him to the waggon and get in; hitch him to no two-wheeled affair unless you want your neck broke, nor to any go-round process. If there is much fear that the colt will kick, check him up pretty close at first, and he will not be likely to get his heels very high. Be gentle and patient; have no sharp bits on him from the first, and do not hold him too tight; let the other man lead him a short distance, and then do up the halter. If he jumps and plunges, keep in the waggon and be patient; I never get out, so long as colt, waggon, and harness hold together. Do not let him go out of a walk, nor even know that he can trot, until you have driven him several miles up hill and down on a walk, and then not until you can say he drives as kind and nice on a walk as an old horse. After the first day get into your waggon to back him; drive any and everywhere you would an old horse; only be gentle and patient, and very cautious how you use the whip.

And now that he is fine, fat, and sleek, keep him so; feed a little grain, and use him carefully every day until he has become accustomed to the harness, and you feel safe with him anywhere. Never drive him so but that you know he will be as well off the next morning as the morning previous. Three-year-old flesh on a horse seven years old is worth a dollar a pound, and like old cheese growing better every year. If your colt is inclined to shy in the harness, drive up to the object, or as near it as practicable; stop him, and let him stand awhile; practise it invariably, and you will soon have a gentle horse. Do not brag how fast he can go until he is seven years old; do not trust your boys out of sight with the colt; let them take the old horse; if he has been managed upon my principle he is a good one; and if not, your colt will soon be no better.

If you have a good colt that you wish spoilt, send him out to a reputed colt-breaker—one who will bit him square to the mark, and with whip and spur push him right to the point, so that in three weeks you will have a colt *broke* scientifically, *physically*, and *constitutionally*; flesh gone and going, mouth raw, appetite gone, spirits gone; will have the scratches, from derangement of system, for the rest of the winter, and if in the spring you turn him out to grass, he may come up in the fall to half the value he had the fall before, less 15 dols. paid for breaking. We hardly realize how easy it is to spoil a good colt, and the good ones are the easiest spoiled. I have seen many one-hundred-and-fifty-dollar colts in six weeks time brought down to 100 dols., and never again get above that price, all from not knowing how they should be treated and what they can bear.

I find, when I go out to buy, only about one horse in seven, among horses over seven years old, that can be relied upon in every point. In reply, "Is your horse sound and right?" "Y-e-e-s, for anything I know. He had the horse-distemper last year, since which he has had a little cough sometimes, or he has a slight bunch on one joint; was a little lame at first, but have seen nothing of it of late; or he favoured one fore foot a little some time ago; or he bites the manger a little; or he ran away and broke my waggon, since which I hardly dare trust my children with him. Now I think the horse worth 140 dols.; yet as I wish to dispose of him I will take 125 dols." While the fact is hardly admitted that he is wind-broke, heavy, foundered, spavined, or run away, and ten chances he has two or three of the above complications or others worse, which induce the owner to dispose of him 15 dols. less than the price of a sound horse.

Now when you go to buy, if the horse is admitted to have now, or to have ever had the least fault or blemish, leave him for the next man, even though you can buy him at half-price. I dare not trust myself to buy amongst strangers, and rather buy a colt and work him into a horse than buy among acquaintances. And if you get a horse on your hands that is not what he should be, no matter what you paid, sell him to a dealer in second-hand horses, and not try to palm him off for what he is not. Do not sacrifice your reputation as an honest man by a few dollars on a horse; as if you sell under any want of true colouring, the man to whom you sell and his friends will carry just as good an opinion of you as you will of the man of whom you bought. And will you be likely to buy of him again a horse or anything else?

What I have said is designed for those who buy horses out of necessity, and for those who make the rearing and disposing of colts one branch of an honest living, and not for jockeys or horse speculators. I should like to say more in relation to feeding and driving horses of different ages, &c., but am getting tired of it, and had I supposed I should have written so much, would not have undertaken it; and fearing the reader has become tired before the writer, I close.

C. O. PERKINS.

Becket, Berkshire Co., Massachusetts, U. S.

—The Country Gentleman.

## THE COMMERCE OF CHICAGO IN 1856.

We must take the credit of being the first periodical in this country that brought the vast capabilities of the port of Chicago, as a grain depôt, before the notice of our merchants. We have had for the last five years an intelligent and influential shipper as our correspondent there, who has periodically—indeed, with almost every mail—sent us a market note from that city. In the month of January, 1855, he forwarded a communication, in which he gave proofs that went far towards establishing his opinion, that “Chicago was the greatest grain port in the world.” On the 29th of last September we announced the arrival, at Liverpool, of the “Dean Richmond,” a vessel of 387 tons burden, direct from Chicago and Milwaukee, through the Welland Canal, which, were it but enlarged to the requirements of the trade between that city and this country, would go far towards enriching the merchants and shippers of that locality. The Welland Canal is the passage from Lake Erie to Lake Ontario, and thence into the St. Lawrence the navigation to the Pacific Ocean is free.

That such improvement must be ultimately effected in that canal from the result of the trade springing up in the prairie city of Chicago is as clear a deduction as facts and figures can give us. Ten years ago there were not ten thousand people in the whole territory of Illinois. Twenty years since Chicago was a small village at the southern end of Lake Michigan, where at night the howl of the prairie wolf might be heard from all parts of its dwellings. In 1857 it is a city of more than one hundred thousand inhabitants. Then, the little village that bore the germ of a large city in its bosom, imported her beef, her butter and her flour, although growing corn more than enough for her wants. Now, the city though only budding into life, gives forth for exportation twenty million bushels of grain; while her beef, in the markets of the world can compare in weight, and bears in price as high a value, as that of any other nation. At the former period railways were unheard of, and even five years since there was but one (about forty miles in length) connected with the town. In 1857, ten trunks and a great number of branch lines, counting more than three thousand miles of railway, are centred in that vast grain emporium. Who then can pronounce the extent to which such a city may spread? The agricultural resources of the country in connection with it are exhaustless and wonderful; the climate is well suited to our hardy Saxon race; its mineral deposits of lead, iron, copper, and coal are reputed to be unsurpassed in richness and extent, and all are well qualified to call forth the energies of an enterprising and greatly-increasing population. If, then, we look at the advance made by the city of Chicago in twenty years, it shows clearly the immense progression which is going on in the Western World.

Our correspondent has now forwarded us a re-

view of the commerce of Chicago for the year 1856, but its great length precludes the possibility of its insertion. Yet so marvellous is its history, that we cannot pass it over in silence. We will take a glance at the figures given in connection with its corn trade, and, drawing a comparison from previous years with that of the past (1856), by such means give our readers a general view that we trust will prove interesting. It must be remembered that the year 1855 was peculiarly favourable to the export of grain from America, as well as to its enhancement in price, in consequence of the belligerent attitude of the great nations of Europe, which, by thus employing the human material in the fearful strife of that year, caused increased demand from the United States for their breadstuffs and provisions, while all other branches of business immediately attendant on trade were similarly benefited. Yet, still, the year of peace 1856 shows, in contrast with its stormy predecessor, a vast increase in the trade of Chicago. We find that the exports of flour in the year 1855 were 163,419 bbls.; in 1856 they increased to 216,389 bbls., and that in the face of a great decline in prices, as in Christmas, 1856, flour was only 3 d. 75 c. to 5 d. 50 c. per barrel, while at the same period in 1855 it was 7 d. 25 c. to 8 d. per barrel; and the decline was gradual and rapid from the Christmas of 1855 to the latter period. The enormous quantities of wheat produced in the country tributary to Chicago, and the superior facilities afforded to millers for making choice selections, must have a continued tendency to increase the investment of capital in the flour trade, and consequently multiply its shipments to an unknown extent.

The wheat trade of Chicago is reported as immense. No better evidence can be given of the growth and prosperity of the Illinois district, than the rapidly increasing quantity of this cereal annually poured in upon its market. In 1852 the total shipments were less than 1,000,000 bushels—last year they were nearly 9,000,000 bushels. The receipts of this grain in 1856 averaged 28,000 bushels every week-day; while its shipments were 26,000 bushels per day. But the figures of the statement before us for the last four years will speak for themselves. There were shipped from Chicago in the year

	Bushels.		Bushels.
1853 . . .	1,685,796	1855 . . .	7,535,097
1854 . . .	3,038,955	1856 . . .	8,767,700

The change from the high prices of 1855 to the lower ones of the past year may account for the small increase in the shipments of 1856-55, as compared with those of 1855-54; for we find that whereas in Dec., 1855, wheat ranged from 1 d. 30c. to 1 d. 35c., and red and white winter from 1 d. 65c. to 1 d. 75c. per bushel; in the same month of 1856 it was only 77 c. to 78c., and red and white 90c. to 100c. per bushel.

But large as have been the shipments of wheat, they have been greatly exceeded by those of Indian corn. In Illinois alone the estimation of the produce of this crop is almost fabulous. 180,000,000 bushels were reported as having been well ripened and harvested in a good condition in the year 1855. On the growth and good harvesting of this crop often depends the price of wheat and other corn, and in reviewing the prospects we have of wheat and flour from America, we must not overlook either the failure or the bountiful supply of Indian corn. The shipments of that grain from Chicago for the year 1855, were 7,517,625 bushels; in 1856 they increased to 11,129,688 bushels, and that in the face of falling prices, as at Christmas in the former year it was 50c., while on the 1st of December last year it only stood at 35c. to 36c. per bushel of 60lbs. The oat crop has been declining, as there seems to be an indisposition amongst producers to give attention to its cultivation. Little more than sufficient for their own immediate wants is grown—hence the prices are in contrast with other grain, being dearer in 1856 than in 1855; in December of the former year, 32c. to 33c., against 28c. to 30c. per bushel in 1855.

We congratulate the citizens of Chicago upon their extraordinary progress in commerce, and consequently in civilization; which, from the peculiar position of their city, must go on improving to an extent almost incalculable, from their immense and illimitable resources. Truly does the report say, "the history of the world furnishes no parallel to it, and hence all estimates based on past experience respecting the results to be here worked out must necessarily fall short of the actual fact." However, there cannot be any reasonable doubt, from the experience of the last four years, that the future pros-

pects of the lake-bound city will not fall short of its past history. On the contrary, from the benefit to be derived from its great coal beds, situated within a few miles of Chicago, and the consequent importance of the cheap and plentiful supply of fuel for mills, factories, and railways, a further impetus will be given to her trade and commerce.

For those who are better acquainted with M'Cormick's reaper than with the manufacturer or his workshops, we condense the following details of his large manufactory, near the city of Chicago, which may be found interesting and suggestive. It covers four acres of ground on the main branch of the Chicago river, near its entrance, and consists of several substantial buildings. The main building is 240 feet long by 40 feet wide, and four storeys high; beside this is a foundry, blacksmiths' shop, and other buildings of similar capacity. It was established in 1847. In the year 1854 the number of reapers manufactured was 1,550, and in 1855, 2,658, the cost of the raw material for the latter being 103,786 dollars. In the year 1856 the number manufactured increased to 4,060 reapers, of the value of 629,300 dollars, the cost of the raw material being 157,000 dollars. All these were manufactured exclusively for the farmers of the west, especially of Illinois, and none of them are sent to this country. The increased demand for Reaping Machines shows forcibly the value set by the farmers of America, on any means by which the labour of the harvest-field can be cheapened; at the same time it points with a true index to the increased and increasing quantity of land that is brought into tillage by the immigrants that are continually pouring in on the New Western, from the overgrown and unemployed population of the Old Eastern World.

## THE PROPOSED PLAN FOR USING THE SEWAGE OF NEWCASTLE-ON-TYNE.

The reception experienced by the paper which Mr. Ferguson lately read before the Farmers' Club of Newcastle-on-Tyne, on the application of the sewage of towns to agricultural purposes, gives some hope that we are approaching the solution of a long-debated question—the application of manure in a liquid form by means of the steam-engine and underground pipes. The above mode of applying the sewage of towns to the land has repeatedly been urged in this Journal as the most, if not the only feasible method. One obstacle to this mode of utilizing the sewage has been the prevalent feeling in favour of solid manure in the established form; and though there has been abundance of writing and speaking on the subject, the facts have not been sufficiently brought before the farmers' eyes by ocular demonstration. We ought long ago to have had some experiments in different parts of the country on this mode of collecting and distributing the sewage of centres of population of moderate extent. The agriculturist would thus have become familiarized with this form of manure, and

we should not now be bewildered as to the best method of dealing with such a gigantic enterprize as the utilizing of the sewage of London.

We lately gave a full report of Mr. Ferguson's paper. As, however, some of our readers may like to see the substance of it in a more condensed form, we will endeavour to lay before them a brief summary of its most important contents. The subject is introduced with a statement of the various experiments which have been made in the application of manure in the liquid form, both the manure of our farm-yards and the sewage of towns. This is followed by an exposition of the plans suggested for utilizing the latter, and by details of that which Mr. Ferguson proposes to employ in the particular instance of Newcastle-on-Tyne.

As regards the experiments which have been made in the application of farm-yard manure in the liquid form, their value may be considered to consist chiefly in the light which they throw on the practicability of applying the sewage of towns in that form. The propriety of reducing all the manure of a farm to the liquid state

is very questionable. We are not certain that the attempts which have been made to do this have not had a share in retarding the application of the sewage of towns. Farmers might have been convinced that the liquid form was the best way of applying the liquid manure of towns, who have become alarmed at the project of converting all their solid muck into liquid manure. On every farm, however, where a steam-engine is used, whether fixed or portable, there should be a small portion of land near the homestead having pipes laid under it, communicating with a tank, by which all the liquid manure at present wasted may be distributed over some land near the farm buildings, to be cropped with Italian rye-grass, which seems to be the crop best adapted to this kind of cultivation. As manure judiciously applied invariably reproduces manure by increasing the quantity of live stock the land can maintain, this kind of cultivation will invariably extend itself by increasing the quantity of land capable of being dressed in that way. The same may be said of the sewage of towns. We can only expect its use to come into operation gradually. Farmers can scarcely be expected to revolutionize their whole practice—rushing at once into its exclusive use. They may, however, take a portion from those companies who undertake to convey it to them, and the advantages resulting from it will lead to its gradual extension. The expense of laying the pipes down need be considered no obstacle. Let people once make up their minds to the use of sewage, and there will not only be companies ready to lay mains for conveying it into the country, but to lay down the necessary pipes for its distribution over the land. The expense of this per acre will not be much greater than that of draining, and there will be companies as willing to undertake the one as the other, to be paid for by a terminable rent-charge. In the present state of the question the farmers cannot use the sewage because it is not brought down to them.

The greatest objection raised against the practicability of applying our town sewage is the state of dilution in which it will be. The reply is, then, let it not be so much diluted. Let there be separate drains to carry off the storm water. The extra expense necessary for this purpose is no objection, if by so doing it will convert into a source of revenue what would otherwise be valueless or a source of expense. This is part of the plan proposed by Mr. Ferguson at Newcastle; and though he has no faith in the deodorizing plan as ever likely to produce a valuable manure, since, as every chemist knows, after all the deodorizing the most valuable portion will remain in the liquid, he proposes nevertheless to apply that process to such part of the sewage as the farmers do not take. His plan is this. Had there been a tract of country within moderate distance to which the sewage could have been conducted by gravitation, the application of the sewage of Newcastle would have been comparatively easy. This not being the case, he proposes to make the discharge from the main sewer into a tank, where a powerful steam-engine is to force the sewage to a certain elevated point. That

however not being of itself sufficiently high to command the whole district, he proposes to fix to the two sides of a certain building, which he points out, pipes of the same size as the main pipe. The sewage would thus be forced up one pipe to a small tank at the top, and then by its own gravitation flow down another; so that sufficient head pressure would be obtained to deliver it by jet six miles to the north of Newcastle, and by means of small pipes diverging right and left, to carry it upwards of two miles on each side of the Newcastle and Berwick Railway, along which it is proposed to lay the main pipe. It is proposed that the small tank at the top of the tower should be provided with an overflow pipe leading to a waste pipe, so that when the sewage was too much diluted it would flow into the river. By this plan there would be considerable waste, unless a large covered reservoir were made, with an auxiliary engine to keep the pipes always full. The area through which it is proposed to lay the main would comprehend an extent of 25 square miles, which is estimated as sufficient to consume all the sewage of Newcastle with the present population. This it is calculated would be sufficient to manure, allowing annually 200 tons to the acre, in which there would be 8 cwt. of such manuring matter. It is proposed to intercept any solid matter which may be in the sewage-water by vertical gratings in its way to the tanks. This would be taken out at the company's works, partially dried, and put into barges on the river. It is remarked that for such a scheme as this the co-operation of the farmers and landowners would be required. Mr. Ferguson, however, appears very sanguine that they would readily take the liquid at 2d. or 2½d. the ton. On the other hand he points out that if the deodorizing process alone shall be adopted, in consequence of the commission recently appointed deciding in favour of such a mode of dealing with the sewage, which he does not anticipate, a heavy rate will be necessary for sanitary purposes in consequence of the small value of the precipitated matter as manure. On this point the opinion of Professor Way is cited, that if the liquid sewage could be distributed over the extent of surface which it is capable of fertilizing, a revenue would be forthcoming towards the reduction of the town rates.

Mr. Ferguson further gives it as his opinion that if, contrary to expectation, the commission should decide in favour of the deodorizing plan, the two processes might go on together, by having sufficient works at the place; so that when the sewage was not wanted by the farmers, it might be precipitated and deodorized, and the solid precipitates sold as manure.

Objections have been raised to the employment of the sewage in a liquid state, that the fertilizing fluid when thrown over the surface emits an intolerable stench. This, however, he contends is a mistake. Farm-yard manure when spread on the surface emits a much greater and more enduring stench; while the smell arising from sewage-water is much less permanent, soon sinking into the soil.

The following is given as an approximate estimate of the cost and returns of the plan, as far as possible,

without making an actual survey. Passing over details, the general results of this calculation appear to be as follows: For the construction of sewers, three large tanks, each 45 feet in diameter and 40 feet deep, houses, sheds, works, steam engine, main and distributing pipes, together with land and house property, to be bought, it is calculated that £60,000 would be required. The returns for this outlay are estimated on the supposition of the sewage being rendered available for an area of 16,000 acres. From this 3,000 acres are deducted for woods and other lands to which the sewage would not be applied. This leaves 13,000 acres for the sewage manure. And assuming each occupier to take on an average 200 tons per acre annually for his land, and to throw over his manure heaps (which is only half what Smith, of Deanston, reckoned to be required for grass land), this at 2d. the ton, would produce a gross revenue of upwards of £21,600. This is exclusive of the sale of solid matter, to be obtained by the intercepting gratings. The working expenses are

calculated at £13,300, including 4 per cent. on the capital embarked. This calculation would leave a net revenue of £8,300, or an additional 11½ per cent.

The plan appeared to have met with general approbation from all the audience who spoke on the subject. Some had looked into the estimates, and approved of them; others considered the plan would answer if it only paid 6 per cent.; others bore testimony to the value of liquid-manure, and the irrigating process as practised in Scotland; while some declared that the sewage would pay the farmers even at 6d. instead of 2d. the ton.

Upon the whole it may be hoped that the plan of applying sewage in the liquid form will receive a fair trial at Newcastle. Much will depend upon the farmers, and their disposition to avail themselves of the liquid manure when brought to their farms. The great work of all, however, will of course rest with those who undertake the supply—the economy and convenience with which they can carry out their arrangements.

## CATTLE AND HORSE DEALING—SHEEP AND PIG JOBBING.

I am ever anxious to advance the prosperity of agriculture in every department of its practice, but my shortcomings often perplex me, and my misgivings trouble me, lest I write to little purpose; and casting about to find something approaching originality, worthy to bring before a reading and discerning agricultural public, adds to my anxiety. At the risk of exposing myself to no little censure, both from dealers and farmers, I have chosen the subject included in the heading of this paper (*Cattle and Horse Dealing—Sheep and Pig Jobbing*) upon which to make a few observations, chiefly with the view of showing that the system has not only become universal, but that it has established itself so firmly amongst the farming community as to injuriously engross nearly the whole trade connected with the grazing department of a farmer's business, *i. e.*, that the purchase and sale of his horses, cattle, sheep, and pigs is now the business of the intermediate dealer and jobber, rather than between the breeder, feeder, grazier, and the consumer or user; and of course the profit is thus divided.

I am well aware that I have selected a complex and somewhat difficult subject, taking it in its most comprehensive sense as applied to a large trading and commercial country like Great Britain; but viewing the question as a simple act of transfer between the breeder and grazier, *i. e.* those whose business it is to breed and rear animals for grazing, and those whose business it is to graze and fatten or otherwise prepare these animals for sale or use, the difficulty in a great measure vanishes. That an intermediate agent or middle-man acting between the producer and consumer, even in the business of a farmer, is often advantageous no one will deny. The corn merchant can readily obtain a fair profit or remuneration for his skill and labour by making purchases in the country market—collecting in bulk from

numerous sources the many small parcels to make up a quantity most likely to meet a ready sale at the consuming markets. This he can do at a less cost proportionately than the farmer, who would entail a like personal expense upon every small parcel without making so good a sale; as millers doing a considerable business are not ready purchasers of small parcels. So also is it often advantageous to the grazier occasionally to sell his fat and other stock through the medium of a salesman. It would not be a profitable course for him to undertake to accompany his stock—every small lot of cattle, sheep, &c., to the distant market; and, as the system of good grazing requires a very gradual reduction in the number of depasturing animals, it is far better to employ a salesman, both for convenience in grazing and profit in business.

Intermediate agents, *i. e.* salesmen, dealers, and jobbers, are undoubtedly a useful class of men to a certain extent in promoting a farmer's progress in business; but the engrossing of the whole trade in horses, cattle, sheep, and pigs, by dealers and jobbers, cannot fail to be detrimental to him, and ultimately a loss has to be sustained conjointly by the breeder and feeder on the one hand, and the consumer on the other; the dealer or jobber taking the profit which otherwise would accrue to one or other of these parties. That this system of dealing and jobbing as now carried on, and all-prevalent in every district, is injurious to agriculture, is, I think, unquestionable: but, admitting it to be questionable, it is not a legitimate and proper course. Why are the producers and consumers called upon to support an intermediate class of men who have no right or title to an interest in their business respectively? and yet this very class of men are becoming exceedingly numerous, and more wealthy than any similar order of men. Their doings and operations affect very materially



every order of agriculture. They are ever in the market. The grazier seldom experiences the chance of a cheap bargain from the breeder, nor does the breeder ever find a good customer in the grazier. The dealer is always at his elbow, and such is the infatuation of farmers generally, that they always prefer a sale to the dealer, under the impression that he best knows, and will give the fairest value for the lot on sale. And the grazier in his turn has the like preference; he will generally give the dealer a higher price than he would offer to his fellow-farmer. Moreover this class of men, from either being so wealthy, or in possession of unlimited credit at their banker's, carry on a large credit business with the graziers, and many a large holding is partially or wholly stocked upon this credit. Again, many large and wealthy graziers widely employ this class of men to "look out for them," and purchase as their judgment dictates; and when grazed or fatted, the same men are employed again as salesmen, to dispose of them. Another great feature connected with this class of men is, that the greater proportion of all kinds of stock annually brought into the market is either the property of these men, or placed in their hands by breeders for sale, so that in fact nearly all the business of the fair or market is in the hands of dealers. You must buy of them—you must sell to them—without them you cannot move—your legitimate business is in their hands—the profit is theirs, the loss yours. Should you feel determined to make your own purchases, you are beset by parties who, professing to serve you, actually take bribes for introducing you to the dealer, of whom you make your purchase. The unwary are often practised upon by dealers in concert. In horse-dealing this is notorious, and yet

farmers derive more benefit, and on the other hand suffer less loss, from this class of men than any others, and as the transfer of horses is generally to a great distance, when sold, which a farmer could not well accomplish, it is to his interest to deal with them. Jobbers in pigs, again, are relatively more useful to the farmer. Pigs are generally sold in small lots, and for the most part retailed out individually, every poor man buying his pig. This order of sale would not greatly benefit the farmer; but the great lots of cattle and sheep which are matters of every-day sale is a totally different thing. It greatly behoves every grazier and breeder of these two important classes of stock to look around him, and ascertain if any course can be adopted to save to himself the handsome profit pocketed by this intermediate class. It ought to be done. Agriculture was never designed to yield three profits; it will scarcely yield two, and those not overwhelming. Something must be done. I counsel you (both breeders and graziers) to discard and discontentance the whole class, and deal fairly between yourselves. You only want confidence. It is manifestly the dealer's operations in the market that at the present time are keeping up and enhancing the price of all grazing stock, otherwise they would partake of the general depression experienced in the corn-trade. "Down corn down horn" is England's oldest proverb; besides, this unnatural state of prices only makes matters still worse: when the change does come, as come it will, it will be the more rapid and fatal. These men being loath to lose, strive "with might and main" to uphold prices fictitiously, and which they have thus far in this season succeeded in. Graziers should look to this.

P. F.

### GRAZING *versus* CORN-GROWING.

DEAR SIR,—The new phase in agricultural affairs, produced by the apprehension of the approach of the murrain in cattle, demands a passing notice, involving, as it does, considerations of great importance to the British farmer. For the last four years the prices of wheat and butchers' meat have kept tolerably side by side, and it was a matter of indifference, so far as profit was concerned, whether a man grew corn, or reared and fed stock. The case, however, owing to the circumstances resulting from the apprehended danger, has assumed a new feature, which is likely to give an enormous preponderance of profit to the grazier over the corn-grower in future. I will endeavour to point out those circumstances which, in my opinion, are likely to produce this change.

Previous to and during the late war with Russia, unfavourable seasons—first in England, secondly in the United States, and thirdly on the Continent of Europe—had so far exhausted the stocks of wheat in all those portions of the world, that the price rose considerably above the common average. Even with the largest crop ever grown in this country—that of 1854

—the effect produced upon prices was only to keep them from attaining a still higher range. This was aggravated by the large increase in the consumption, owing to the flourishing state of the operative manufacturers, consequent on the influx of gold and the abundance of money, which gave a stimulus to trade. Then came the war itself, with its waste and privation of import—all which circumstances combined to keep up prices for wheat under the otherwise depressing influence of a heavy crop at home, and a moderate importation from those countries not affected by the war. This state of things has continued now for four years; but gradually, by means of improved and increased cultivation, and two plentiful seasons, with a large importation in 1856, the exhausted stock in this country has been replaced in a great measure; and so far, at least, the future will be left to take its natural course, depending upon the fruitfulness or otherwise of the seasons. It is not likely that such a succession of unfavourable harvests in the wheat-growing countries should again occur, to cause such a general reduction of the stocks, as took place in the years 1853, 1854, and 1855, which

threw the corn trade throughout the world out of its natural course, and in this country produced the anomaly of excessive prices with abundant harvests.

During those four years the price of meat, as we have said, kept even pace with that of bread. The consumption of neither has been, apparently, sensibly affected, either during the war, or before or after it. There cannot be a better proof of the healthy state of trade and manufactures in the United Kingdom than the fact that under the pressure of such high prices of bread and meat, and indeed all kinds of provisions, no serious complaints have been heard in the lives of industry in the north. The cause for this is, that the operatives have been in full employment at remunerating wages; and, when this is the case, no class of men spend their money more freely, or with less grumbling at prices.

Latterly, however, the markets have given way, and the price of wheat has been greatly reduced: and with declining prices for bread, we might also naturally look for a corresponding reduction in beef and mutton. Owing, however, to the stoppage of the importation of cattle, a temporary scarcity will be produced, and, very possibly, an export trade will arise, to meet the demand on the Continent, where the loss of cattle by the murrain has been very great. All this, with an enormous consumption at home, has already begun to take effect upon prices, and will, in all probability, do so to a much greater extent in future. I fully expect to see butcher's meat at a price we have not known for upwards of forty years, or since the war with the first Napoleon, everything being now at work to produce

such a result. On the other hand, the increasing importations of wheat, and the increase of produce thereof in the United Kingdom, will tend still further to lower prices in ordinary seasons, or at least to keep them within bounds; for I certainly do not expect to see the average price the next ten years so low as it was previous to 1847.

Under these circumstances, the most judicious course for the farmer to pursue is plain enough. Let him apply himself more sedulously than ever to the breeding and fattening of cattle and sheep, which are certain of bearing a high value for some years to come. At the same time, let him strive by all the means in his power to increase the acreable produce of wheat, so as to make ten acres produce in future as much as fifteen do now. I feel persuaded, from what has been already effected in this respect, that such an increase may be obtained if the proper means are pursued, embracing deep tillage, a more perfect comminution of the soil, thorough draining, earlier, deeper, and thinner sowing, and abundant hoeing. Our farmers have yet much to learn in all these respects, or rather have got to be more fully impressed with their importance, and the direct bearing they have upon production, and the evil effects of neglecting them. I may probably recur to this subject on a future opportunity, as I consider it to be one of great importance to the future welfare of the agricultural interest.

Yours faithfully,

AN OLD NORFOLK FARMER.

London, April 10.

## THE ABUSES OF THE LIVE AND DEAD MEAT TRADE.

We are proverbially prone to overlook evils immediately before us, and from which we are daily and hourly the sufferers, while we zealously guard against others we have hitherto had but little experience of. Habit is after all our great ruler. We patiently continue to endure all the ills of bad ventilation in our customary homes, as if to more especially prize the few weeks' "fresh air" we breathe when abroad. We virtuously declaim against the impurities of foreign cities, as we calmly sanction the uncleanness of our own. We have a wholesome dread of cholera, and at the same time a gradual habituation to typhus. It is the man who coolly put his head into the lion's mouth because he was used to it, and who never felt the danger he incurred until he fell a victim to it. We give, in fact, almost too literal a reading to the poet's lines, thinking it everywhere "better to bear the ills we have," and only to arm ourselves against those "we know not of."

We are forcibly illustrating such a precept just at this present. There are rumours of a very fatal murrain amongst cattle—a disease with which for a long period we have happily had but little acquaintance. Sooner or later we become keenly alive to the subject. We talk it over one with another amongst ourselves.

We stir up the Government. We increase the vigilance of the Executive. We even send out embassies to report on the nature of the evil, and the best means for still keeping us uncontaminated. The great impressive point is, we must not have diseased cattle nor diseased meat in this country. We must and we will do everything to prevent such a calamity. A very laudable resolve, no doubt. But what further are we doing? Simply bearing the ills we have as passively as we are energetically combating those we know but little of. We may suffer no diseased meat to come in upon us from abroad, while we systematically sanction the use of it here at home. A large proportion of the lower classes of this metropolis live on scarcely any but diseased meat. There are hosts of shopkeepers who as a rule trade in nothing else. Diseased animals are openly driven into Islington market, and diseased meat is as publicly sold in Newgate market. We are insisting on the most active and searching inspection of all cattle that come into our ports. We are sending our own veterinary surgeons to the continent. We are discussing the evil in the most practical and determined manner—And all this time what are we doing to correct our own more immediate evils? What are the inspectors seizing? What are the veterinary surgeons reporting on? What is the Govern-

ment doing? Nothing, or next to nothing. We repeat the trade in diseased cattle and meat is well known to be an established business in the city of London. The artisan takes the first of it as his family joint, and the mysterious calling of the sausage maker answers for the rest.

It is only a few weeks since that we called attention to a very able pamphlet by Mr. Sampson Gamgee on the cattle plague and diseased meat. This is now followed by a second letter to Sir George Grey, only just published, and which only further confirms the writer's views and statements. In this second communication Mr. Gamgee more immediately confines himself to our home trade in the metropolis, the abuses of which he appears to be following up with great energy and determination. Here is the description of a recent sally into what, we can only hope, is one of the worst of such markets:—

"I entered Newgate Market at a quarter before twelve o'clock on Saturday night, the 28th March. Numerous little shops were open, and with solitary exceptions, a large quantity of diseased and putrid meat was exposed in them for sale: stinking legs of mutton, sour-smelling fragments of slipped calves, large quantities of beef and pork only fit to be buried. The buyers were a number of poor people; the very appearance of the sellers was such as would be expected, in men living by such disgraceful traffic. I saw a leg of mutton weighing eight pounds four ounces, sold for 2s. 11d.: it had apparently belonged to a good sheep, but was obviously in an advanced stage of putrefaction. The salesmen were lustily crying out, 'Buy me out,' 'buy me out,' and the little throng of ragged and filthy poor tendered at the extempore auction, until the number of pence seemed to the unprincipled vender a sufficient temptation. I sought about the market for officers; but the beadle's closet was closed, and no beadle or inspector of meat anywhere to be found. I represented these facts to City policeman No. 287, on duty in the market. He had not seen the meat inspectors; the beadle had left at eleven—the appointed hour. On my pointing out to the policeman the large quantity of meat in the market unfit for human food, he stated that he had no power to interfere; that business belonged to the meat inspectors. He repeatedly saw the market in such a state on Saturday night; sometimes the stench from the shops was so great that he did not like to walk past them."

All this is in some measure explained by the facts that "eleven o'clock at night is the time appointed for the beadles and inspectors to leave off duty," while "business is carried on until long after midnight."

Let us borrow a companion view of Islington, the new market, the great object of which was to correct the abuses of Smithfield:—

"On Friday morning, the 3rd April, I entered the Islington Market at four o'clock, and remained there till five. The droves were coming in, and business was active in the Ram Inn Yard slaughterhouse, but not an officer of the market was on duty, either to inspect the meat which was being carted off to Newgate Market in large quantities, or to restrain the brutality of the drovers—many of whom are respectable men; but the conduct of others calls for rigid discipline. . . . At ten minutes past seven, the carcasses of two sheep, bearing unmistakable signs of general disease, were carted off from the slaughterhouse of the market. From the manner in which the two sheep were trimmed and dressed, there could be no doubt that they were destined for sale as human food. They were unquestionably unfit, but they might have been ten times worse without the least chance of the disreputable practice being checked; it would never have been discovered but for my unexpected investigation. . . . We found the slaughter-houses in a most filthy state; we ascertained that horses are habitually stabled where the bullocks are killed and dressed—a practice, to say the least, most filthy. Waiting to be slaughtered was an old cow, extraordinarily emaciated and in an advanced

state of disease. The clerk of the market and the inspector alleged themselves unable to interfere with the slaughter-houses because destitute of authority. A Mr. Thatcher, keeper of one of the gates, stated that he sometimes looked to the slaughter-houses, but did not conceive that part of his duty; he admitted the state of filth, and to my remark that in plain English the market is badly managed, he rejoined, 'I know it ia.'"

There is one point in both Mr. Gamgee's letters, and in either an equally prominent feature, in which, we confess, we can scarcely at present follow him. We had supposed that for some years the veterinary profession was surely, and not slowly, rising in rank, ability, and education. From what we have seen of the professors or heads of this college, and still more from the pupils they have now for some time been establishing throughout the country—from the good manner, intelligence, and apparent knowledge of their business, we had thought there was some reason to congratulate ourselves on the progress of the veterinary art. Certain it is that the "passed" practitioner is a very different man from the knowing village farrier with his wondrous drenches and curious panaceas. There is something, however, radically wrong yet. We admit we do not know exactly what this is; but of late, according to Mr. Gamgee, we have been going back instead of forward:—

"As subsidiary to agricultural interests and to the public health, it is of the first importance that the present unsatisfactory state of veterinary science and education in England should cease. I state my deliberate conviction that there is scarcely an institution in Europe in which wise laws are so violated, means of learning and instruction so neglected, as in the Veterinary College of London. I cannot make this statement, prepared as I am to substantiate it by facts in every particular, without expressing deep regret for being obliged to cause temporary pain, by unjustly reflecting on some deserving persons. But exculpation of some would demand inculpation of others, which at this stage would prejudice discussion on the public requirement, by introducing incidental considerations."

Our case here at home, then, may be thus summed up:—Our live and dead meat markets are grossly mismanaged; the common form of inspectorship is little more than a farce; the wise regulations of the original founders of the Veterinary College are generally neglected, and the further interference of the Legislature is urgently demanded. So at any rate argues Mr. Gamgee, and be it understood he is a gentleman who argues well, brings strong facts to support his argument, and declares that "none of these material facts have been denied."

PROPOSED TESTIMONIAL TO MR. VALENTINE BARFORD, OF FOSCOLE, NORTHAMPTONSHIRE.—The friends of this celebrated sheep-breeder, who has now for sixty years been gradually improving upon Bakewell's experiments, have resolved to offer him some tangible token of their appreciation and respect. During the last week we have received a letter from "One of his Customers" on the subject, very warmly expatiating on Mr. Barford's services to the agriculture of his country. It is proposed that the testimonial shall be a painting, embodying portraits of Mr. Barford with three of his sheep; and that every subscriber shall have an engraving after the picture. There is good precedent for this; perhaps the best form of testimonial that could be decided upon.

## THE BAROMETER AS A DRAINAGE TEST.

The recent attention devoted to the subject of land-drainage by practical men has brought to light many wonderful facts, and has given rise to many ingenious explanations of them. Among the most remarkable of these may be mentioned the running of drains before approaching rain after they had ceased to run during a continuance of dry weather, and the rise and fall of water in test holes accompanying the rise and fall of the barometer. The last phenomena are said to have been proved by the experiments of the late Mr. Livesey, at Orton, which, we were told on high authority, seem likely to be confirmed by some experiment now in progress.

Having formed our own opinions on the subject, and having consulted some of those most celebrated for their knowledge of physical science, we have no hesitation in declaring that there are fallacies connected with both statements.

To begin with the case of drains which had ceased to run after a continuance of dry weather, recommencing a discharge before approaching rain: two explanations of this fact occur, which deprive the subject of all mystery. One of these explanations connects the fact with the water held in the soil by capillary attraction, the other with hygrometric moisture condensed from the atmosphere in the drain-pipes. Those who explain the phenomenon by capillary attraction say that the last drops are retained when the drains cease to run, and that a weeping takes place from the same cause which makes the mercury to sink in the tube of the barometer. They illustrate the fact by the following experiment. Take, they say, a number of glass tubes of small bore; let water be poured into them. It will not all run out; a small portion will be retained in the tubes. When the barometer falls, a weeping, from the cause before mentioned, will take place from these tubes which represent the interstices between the particles of soil; and if the extent of drain be large, sufficient discharge will take place for workmen to collect water for drinking from the outlet of the drains, which is stated to have been the case. This is one explanation. That, however, which finds most favour with the majority of the *physiciens* whom we have consulted, derives the water not from the soil, but from the atmosphere. The atmosphere before rain, they say, has become highly charged with moisture. If it comes in contact with a colder surface this moisture becomes condensed on it; the surface of the drain pipes is such colder surface, and produces a weeping from the atmosphere, not from the drains.

This explanation may be illustrated as follows: Let us suppose a party travelling by an express train, among whom is a most enthusiastic drainer of land, who, if he could have his way, would not leave a drop of water in the country. The compartment of the carriage is full, and much agreeable and instructive

conversation takes place. It takes the turn which we have often known it to take. The state of agriculture in the district through which the train whizzes along is discussed: the shortcomings of farmers in not following the advice which all are so ready to give them gratis, the advantages of land-draining, the neglect of it—the necessity of improving outfalls. The day is cold, and all the windows are closed by mutual consent, after many polite inquiries. The glass soon becomes so covered with dew, condensed on its cold surface from the breath of the party, that their agricultural criticisms on the district which they traverse are brought to a close, and they have recourse for conversation to the usual topics of the day—the last terrible murder or the last great fraud in respectable life. Should the journey be at the present time, the topics would be the Chinese war, and the results of the appeal made by her Majesty's ministers to the country's judgment. The moisture exhaled from the lungs of the party, which had condensed on the glass, collects into drops of water; these gravitate into larger and larger globules till they glide in a stream down the glass. None of the party, however, not even the enthusiastic drainer, supposes that the moisture comes out of the glass, even though he may have been descending before on the sensitiveness of well-drained land, as proved by the running of drains before rain.

The rise and fall of the water in the test-holes at Orton does not admit of a similar explanation. That the water may have been rising, and the barometer may have been falling simultaneously, we do not pretend to deny; while we question the existence of any relationship of cause and effect between the two facts. We question it because it is so opposed to the analogy of what takes place in wells, and these test-holes are but wells on a small scale.

It is a known fact that the water of wells is highest at mid-summer; not at mid-winter, as many would suppose. The explanation of the fact is, that it takes six months for the rain-fall to percolate through the soil, subsoil, and substrata, to the wells. But the test-holes at Orton rose before rain, whose approach was indicated by the fall of the barometer. If, then, there is any connection between the two facts, we must suppose that the rise of water in wells at mid-summer takes place, not in consequence of the rain-fall of the preceding winter, but of that which is going to take place during the next, *quod plane absurdum est*, as old Euclid would say. The truth of a theory may often be tested by carrying it out to its consequences. In this manner we submit that the rise and fall of the water in the test-holes at Orton having any connexion with the rise and fall of the barometer is disproved, although the two events might take place simultaneously.

There are many persons, however, who, while they

glory in the title of practical men, are very much addicted to theories, provided only they be theories, or rather assumptions, of their own. Probably there are no men, whose opinions as practical men ought to have more weight on subjects connected with the percolation of water through the soil, and its collection in pits or wells, than those of brick-makers, well-sinkers, and navvies. From these practical authorities we have frequently heard a very remarkable fact: it is no less than this—that water accumulates faster in such excavations during the night than during the day. If the fact is remarkable, the explanation of it is still more so; and who should know so much on the subject as men practically engaged in making such excavations? Their explanation of the asserted fact is neither more nor less than this, expressed in the very words which we have repeatedly heard from their own mouths: "The earth," they say, "turns over at night, and the water naturally runs to the lowest side." Whether this explanation will apply to the case of the water in test-holes rising before approaching rain, is

very doubtful. The explanation which we should offer of the accumulation of water in holes during the night is this: In the day-time the workmen bale it out by little and little, and are not aware of the amount. In the night, during the cessation of their work, it accumulates, astonishes them by its quantity, and gives rise to the novel and ingenious theory above-mentioned. We commend it, however, to the serious consideration of those who are disposed to experiment on the subject.

After all, however, supposing the facts established of the connection of the rise and fall of the barometer with the rise of water in test-holes and the running of drains, it is very questionable whether it could be turned to practical account. It is true we might render it available in practice if we could discover the art of making the barometer rise and fall at pleasure, and thus setting our drains running, when our theories break down and our drains will not run. In no other way does it appear that the discovery can be turned to account in practice.

## RECLAIMING WASTE LANDS.

The discussions that take place at the Central Farmers' Club in London—very many, or most of them—and in a conclusion that is well known before the subject is mooted, and make a statement that is told like truth in a small compass, and not requiring any circumlocution or demonstration to establish the certainty. The latest statement on the reclaiming of waste lands is self-evident—that in addition to admixture with earths and earthy matters, waste lands will be well managed in green crops raised by artificial manures, and consumed on the ground by sheep. Against this conclusion no voice can be raised. Waste lands adapted for turnips will be covered with a thin vegetable sward, which is best fallowed into the land by workings, and immediately sown with turnips. In other cases of all rough grassy surfaces on lands clayey or loamy, and on which much inert matter has accumulated, paring and burning is by far the most effectual mode of reclamation, the effect proceeding from the increased temperature of the ground by the heat of the flames, and from the ashes produced by the reduction of the earthy and vegetable sward. Wherever an earthy thickness is found covering the subsoil, and with a covering of grassy herbage, paring and burning will produce a great effect, as the upper stratum of exuvial vegetable and animal matters has a powerful tendency to imbibe and retain caloric from the heat of the flames, and to husband it for future use; but when the upper stratum is very thin or none, little effect will be produced. Sand imbibes caloric very rapidly, and parts with it as speedily; it is soon heated, and as quickly cooled, and is very unsuitable for a conducting medium. Clay is a very bad conductor of caloric, and is at the bottom of the scale of graduated bodies; but is better than sand, and is more benefited by paring and burning. Lime acts, like paring and burning, by imparting caloric, and raising the temperature of the ground; and the small benefits conferred by its action on sands and clays are accounted for by the above reasons. Clay denies access to caloric; and receives and transmits it without retaining the element. But when vegetable and animal remains form an upper stratum of some

thickness, both applications in lime and paring and burning will act with certainty. Thin light waste lands of all kinds are improved by earthy applications and immediate fallowing, for green crops, with artificial manures, the crops being consumed by sheep on the ground.

My own experience in reclaiming waste lands of various kinds would state the average expense at £8 or £9 an acre, including the fencing, which is seldom mentioned. When draining is required, an additional sum is necessary. Mr. Smith's statement is too little varied, and suited only to his own locality. The highest expense of £15 and £18 is a landlord's performance; but no length of lease is mentioned in the case of a farmer undertaking the improvements. The rotations of cropping are somewhat fanciful—mustard and wheat are not generally suited for waste lands. I recommend the first crop to be turnips or rape in every case, and consumed on the ground by sheep; second crop, oats with cloverseed; third crop, clover consumed on the ground; and fourth crop, oats or wheat, as the land may be a loam or a clay soil. Afterwards put under the regular rotation of the farm in five years: first year, fallow or green crops; second year, oats, barley, or wheat; third year, hay or pasture; fourth year, pasture; fifth year, oats. This course of cropping needs no variation for any locality in the United Kingdom. The great objection is removed, of being confined to one district.

No land need remain waste, if the known means are applied for the reclamation. It is true that the term conveys the meaning of inferior circumstances, which only removes to a greater distance the term of remuneration. Any lands may be rendered productive that are situated under a climate that permits the maturation of crops; it is the ruling power, as no alteration can be made. Wherever the whirling progress of a railway places a station of convenience, buildings are erected with cottage-gardens attached, of which the deep digging and constant manuring with vegetable dung show the gradual formation of producing grounds from any quality of natural deposit, even from pure chalk itself. These important

lessons are a national concern, and are far beyond the farmer's employment; and even exceed the landowner's sphere, though his position certainly does embrace such objects, as there is certainty of inheritance for the issue. But few minds can

rise beyond the idea of speedy gain, and rarely can any eye extend its vision to an object that is not nearly to be observed; calculations wholly fail, and resolutions are deficient. J. D.

## THE BEST METHODS OF GROWING AND PREPARING FLAX, WITH A COMPARISON OF NATURAL AND ARTIFICIAL MODES OF STEEPING.

One of the "subjects" on the Society of Arts' Prize-sheet, is "For an Account of the best Methods of Growing and Preparing Flax, with a Comparison of Natural and Artificial Modes of Steeping." And we anticipate some valuable information in the essays which have no doubt been sent in for competition. It is certain that very great progress has been made in the preparation of flax-fibre within the last few years. In the two essays on flax which appeared in the Royal Agricultural Society's Journal in 1847, no mention is made of artificial steeping; the comparisons there being confined to dew-retting, and different methods of steeping in pits or running streams. The only processes described as capable of being performed in "mills" or "works," are the mechanical breaking and scutching by steam or water-power.

In a paper on Claussen's flax-cotton, in the Journal for 1851, allusion is made to hot-water steeping, and a new artificial process is proposed. Those of us who knew from experience what a drawback to the extended growth of flax existed in the carriage of so bulky a crop to a distant market, were led to expect great things from the machine, by which the farmer could separate the useless straw from the fibre, without steeping, and thus have a less weight to transport to a mill or factory, where the after-chemical operations could be carried on. Again, Claussen's method of boiling the flax for some hours in a weak solution of caustic soda was entirely to supersede the fermentation by hot or cold water previously practised, and produce a better fibre for the machinery of the linen manufacturer. By washing the flax after the boiling, soaking it in a solution of carbonate of soda, and then in a weak solution of acid, effervescence was caused in the hollow cylinders of the fibres, which, being split by the expansive force, were rendered fine enough for cotton machinery. However, in spite of discussions, experiments, patents, &c., and promised advantages, this proposal did not have the effect of spreading flax cultivation over the kingdom.

Hot-steeping, patented by Schenck in 1846, obviates the irregularities both of time and effect produced by the cold steeping. The first rettery on this principle was established in Mayo, in 1848: now there are a great many at work in different provinces of Ireland, and several in England, consuming, perhaps, 50,000 or 60,000 tons of straw annually. In this the principle of fermentation is the same as in the old process, but is placed under the control of the operator, who can regu-

late the action of the steep according to the quantity of the flax, or the article he wishes to produce. There is, however, the same destructive fermentation at work as in the ordinary steeping, and generating the same foul and offensive gases.

In 1852 we had a new process introduced—that of simply steaming it, which requires only a few hours, instead of the three or four days as by the hot-water steep, or the two or three weeks by the old method; and requires no expensive apparatus, or costly and dangerous chemical solvents. Watts's process of forcing a jet of steam upward through the flax, and allowing the condensed water to percolate downward through it, carrying away the extractive matter dissolved out of the straw, is being largely practised, we believe, in Ireland. It is certainly a great improvement upon Schenck's system, inasmuch as it involves great saving in time, economy of fibre, less risk of injury, avoidance of any nuisance, and beneficial application of the waste products. Very speedily Buchanan patented an improvement upon Watts's method; a beautifully simple and perfectly automatic apparatus, causing the flax to be subjected to repeated immersions in heated water, arrangements being made by which the temperature is never allowed to exceed a certain degree—a point of great importance, both as regards the abstraction of the azotized extractive matter, and also the quality of fibre produced. A drawing and description are given in the *R. A. S. E. Journal* for 1853.

Drying the steeped straw, preparatory to scutching, has always occupied much time and proved a costly process as regards labour. The ordinary mode is to place the flax, thinly spread, between two wooden laths, which, when closed (by means of hooks or rings over their ends), firmly hold the stems; about fifty-six of these are required for a cwt. of flax. They are then carried to the drying-shed, and suspended from frames, where they remain for the air to dry them—which it does in three or four days to as many weeks, according to the weather. Watts dries the flax in a steam-heated chamber. Buchanan drives dry warm air through the flax, the air being readily obtained in the desired state by causing it to pass through porous earthenware pipes set across the lower part of the chimney. These communicate on one side with a blower (driven by the engine), and on the other side with a pipe which conveys the heated air to the chamber containing the flax. By Buchanan's process it appears that the entire operation of converting the straw into dressed fibre may be effected in one day; the apparatus and ma-

chinery are not such as to involve a great outlay; the cost of labour is very small indeed, and the waste products are in a form to be readily utilized.

At Chelmsford, last year, Mr. George Pye, of Ipswich, exhibited specimens of flax and feeding-cake, illustrating a still newer process of manufacture. The flax-straw, after the farmer has taken the seed, is passed through a machine, which yields a product of broken straw and bark, which are afterwards made into a most nutritious feeding-stuff. It is then placed in a vat holding six or seven tons; a pipe, under a false bottom, introduces a solution of Fuller's earth and water; this is gradually heated by steam, made to boil, and the solution then escapes. The flax is next pressed with a great weight, again washed with the solution, again pressed, washed, &c., and at last pressed very hard to expel the moisture. It is then steamed for four hours, and is a very fine product, with none of the loss which arises in scutching, and with a very small proportion of tow. A more detailed account of this process (patented by Messrs. Burton & Pye) was given in our number for last month.

We suppose that the Society of Arts' essays will comprise full details of these and still more novel processes,

with their economical and practical results. It has been clearly shown, over and over again, that the demand for flax-produce is greatly in advance of the supply, and that the ratio of difference is annually increasing. Land-owners and farmers know very well that flax is not an "exhausting" crop, and that its peculiar suitability to different soils and climates, the short period it occupies the soil, and the market-returns of an average crop, render it a valuable addition to the ordinary rotations. Improvements in the modes of preparation are enabling mills to be established in rural districts, with a certainty of good profit to the speculators; and as further advances are made in the treatment of flax-straw, larger prices will be afforded to the farmer for it; so that we may expect to see the cultivation of this raw-material amazingly extended throughout the country. Depend upon it, should the corn-market sink to a low level, the subject of flax-culture and the building of retteries (or whatever they may be called under the new processes) will be taken up in a practical manner and on a national scale. We are certainly far better prepared for such undertakings than we were a few years ago, owing to the late progress in inventions to which we have been alluding.

### THE TURNIP FLY.

SIR,—As the most useful commonwealth-man is he who can cause two blades of grass to grow where one grew before, so it must be equally admitted, upon the same grounds, that that individual, who can save and rescue the crops which have responded to his labour, toil, and expense, from a perilous and destroying blight, is a useful and serviceable commonwealth member of society.

I am led to make the above remarks from the circumstance of your highly-prized agricultural journal having afforded a full and copious report of a meeting held, I think, at the Leicester Agricultural Society, about three weeks since, whereat the subject of the turnip-fly formed one of the chief topics of attention bestowed upon that occasion. This pest (the turnip-fly) has caused considerable anxiety among farmers, ever since the Swede turnip has been introduced into, and been encouraged in this kingdom; and, although numerous attempted remedies have been entertained and effected, to obviate the above destructive nuisance, yet nothing has up to the present time been found to repress the obstinate evil.

A friend of mine, Mr. George Rumsey, who held a farm of about 250 acres, at a rural village known as Shipton Bellinger, in the county of Hants, assured me that, by sprinkling coal-tar over his young crops of swedes, he found the same prove highly serviceable to his views. The system adopted by the gentleman who addressed the Leicester agricultural assembly upon the subject, appears to have been a plan much in accordance with that pursued by Mr. Rumsey; but, in addition to the mere casual application of the adhesive fluid, he (the former) "en-nets," as it were, the victims of his object—and his objection—by causing sheets of canvas, well coated with a chemical preparation, of an adhesive and attractive na-

ture, to drag them off the leaves of the plant, thereby freeing the tender crops from the destructive incubus.

Both these expedients are very feasible, and are highly creditable to the sagacity of the gentlemen who have purposed them; but the nuisance does not lose its baneful spell under the adoption of the above well-devised regulations. It appears to me (and it is very humbly submitted) that a physiological view of this serious blight should be considered. We can catch and destroy the fly in its full and vigorous stage of existence; but the effect of this course of procedure does not interfere with the cause which generates it.

To what class of insects in entomology does it pertain? Is it of the *coleoptera* order (beetle tribe)? Or, as old Mouffat, the naturalist, affirmed it to be, is it of the *ichneumon* class (he styles it *curvicauda musca*)? Then, by arriving at right premises in this particular, we may deduce right conclusions; but without them, we can arrive at no decisive knowledge of the character of this beetle or fly; we shall remain at a loss how to deal with it effectually to our advantage. Is it indigenous? Is it idiosyncratic with the turnip itself—as is the *morbus pedicularis* in the human constitution? It is the Swede turnip *alone* it appears to infest, just as the cochineal insect affects the *cactus opuntia* (prickly pear) only, abandoning every other plant belonging to that extensive family. Fifty different species of cactus may grow contiguous to each other, but the cochineal blight will infix and feed on *none* but the *cactus opuntia*. Again, when the seed of the turnip was first introduced into this country from Sweden, was that seed occupied by the larvæ of the fly, which might have been suffered to propagate by existing upon its natural and appointed food? Before the swede turnip was encouraged in this kingdom, was the turnip-fly

ever recognised? Is it migratory at certain seasons? and whence does it come? Is it recognised in Sweden? and if so, what effect has its presence upon the turnip crops of that country? What becomes of the larvæ of the fly during the Siberian months of winter, when the ground undergoes tillage, and the earth is thrown into fallows? All these separate interrogatories are worthy of respect, simply because we have as yet discovered no remedy against the destructive innovations of this truly obnoxious nuisance.

Later reports have reached us that the swede crops upturned last year are beginning to rot. It is highly requisite that they should be scrupulously examined, and it should be ascertained whether any traces of the larvæ of the fly can be detected in the tubers.

I am, sir, your obedient servant,

22, Albany-street, Regent's Park,  
London, April 22,

D. G.

## HIGH FARMING AND MODERN MEAT.

SIR,—I have just been reading the following remarks on "high farming and modern meat" in one of the leading medical journals of the day, and I think they are worthy a place in your valuable paper, and will interest many of your readers.

"I am, yours truly,

"Gnoll Castle, Neath,

"W. BULLOCK WEBSTER.

"May 1st, 1857."

—

"Veal and beef were formerly two very distinct things, both good in their way, and one the boast of old England. The practice of modern farming has, however, condensed these two articles of manufacture into one villanous compound, having too close a resemblance to the Gallic 'ros-bif,' for any Englishman to acknowledge with satisfaction. Rich, full-flavoured, mature beef is becoming an extinct thing; and our tables, instead of groaning under the burden of a baron or sirloin, groan at it, or, at any rate, echo our groans and complaints. But this question has other bearings than upon our gustatory pleasures. It has its influence upon the health and vigour of the people, especially upon that of our town population. Let us see how this statement is to be made out. It involves a tale of agricultural economics which every physiologist and sanitary reformer will admit as demonstrative. The farmer fattens cattle not as we citizens in our self-complacent and patronizing moods are apt to imagine when we read the long figures of arrivals at the markets every week, for the mere sake of feeding us and getting a fortune out of our carnivorous propensities, but coupled with a very different object. The modern farmer also looks upon a beast as machine for manufacturing manure. This in some shape he must have. The corn crops, on which his main prosperity depends, crave it imperatively in some shape, and nothing now known answers so well as the home-made product. Guano, superphosphates, and the thousand-and-one delusive compounds puffed with all the quackery of pseudo-science, are not to be trusted; and until modern chemistry produces something better than has yet been forthcoming, the farmer must trust to himself and his beasts. But the thing must be done cheaply. And how? Why, by taking the youngest possible stock, and forcing them most unnaturally. Under the present management it takes about nine months to bring a bullock into a fit state for slaughtering, and in that time it acquires an average increase of about twenty stones in weight. It is now difficult to find lean stock of anything like mature age in the markets, and they are commonly bought in for the fattening, at something like two years old. Home-breds, or calves weaned on the farm, are taken up much earlier, and are often ready for the butcher long before they have reached the end of their second year. We all know that these young creatures gain a much larger proportionate

increase of bulk from a given quantity of food, and in a given time, than older cattle would; and we all know, too, the character of this fast-grown flesh, and the evils attending it. But the oilcake, turnips, beet, hay and straw are passed through the machines, and kept under the machines, as well as if they were good six-year-old bullocks, and if they endure the ordeal without becoming the subject of disease that calls for immediate execution, they make beef of a quality up to the present standard. Still every farmer will admit that the great risk and loss in this process of manufacture arise from deaths by disease, that the sale of the beast does not make a sufficient return for the cost of feeding and tending, and that the profit comes largely out of the application of the manure accumulated and rotted in the yards to the lands destined for corn crops.

"It is impossible to estimate the mortality or the amount of disease arising out of these circumstances, for there are no returns to appeal to. However, every man who has had the opportunity of looking into such matters is well aware that it is far beyond even the imaginings of the most horror-stricken vegetarian. Let any person, familiar with the laws of life and health, but who only knows a bullock in its relation to the metropolitan markets and the shambles, picture to himself a young creature, whose natural term of existence runs over a space of some fifteen or more years, suddenly taken in its first or second year, and confined in a small close yard, there fed to its utmost capacity upon the most nutritive of food, debarred from anything like reasonable exercise, and allowed to stand or lie night and day upon a fermenting and putrefying mass, generally on an average some two feet thick, of its own excrement, straw, and other refuse of the barns and fields, not made the better, though perhaps more sightly, by a fresh layer of clean litter thinly laid every day or two upon the surface. Let him say what plain common-sense, as well as his philosophy, dictates must be the result, and he will only be describing everyday occurrences. Early and late it is necessary to watch these tender, hot-bed, fungoid growths. Disease is constantly springing up spontaneously; the most trifling accident tends to a fatal issue; doctoring won't answer with such material, and the butcher's knife is the remedy to save the beast for the market. The most prosperous result is, that the animal, when it has done its allotted work of manure making, finds its ways to our tables just at that stage of its development when it is naturally most prone to disease, and less fit for consumption or food, even if healthy, than at any other period. This unquestionably is an evil, and one which our officers of health have not investigated. We throw out the suggestion for their consideration; and we may also venture to hint an opinion, founded upon strictly true physiological principles, that our graziers who pursue these practices are in the end their own enemies.

"We have upon our table the answer to a series of questions



relating to this subject, by a most intelligent, practical Norfolk man. In them we find all that have said fully borne out, regrets that no other course should be open to the farmers,

and proof that the true solution of their difficulty, as well as of ours, consists in the economical use of the refuse of our towns for agricultural purposes."

CHEESE-MAKING:

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

**HISTORICAL NOTICE.**—Cheese, and the curdling of milk, are mentioned in the Book of Job. David was sent by his father, Jesse, to carry ten cheeses to the camp, and to look how his brethren fared. "Cheese of kine" formed part of the supplies of David's army at Mahanaim during the rebellion of Absalom. Homer states that cheese formed part of the ample stores found by Ulysses in the cave of the cyclop Polyphemus. Euripides, Theocritus, and other early poets, mention cheese. Ludolphus says that excellent cheese and butter were made by the ancient Ethiopians; and Strabo states that some of the ancient Britons were so ignorant that, though they had abundance of milk, they did not understand the art of making cheese. There is no evidence that any of these ancient nations had discovered the use of rennet in making cheese: they appear to have merely allowed the milk to sour, and subsequently to have formed the cheese from the caseous part of the milk, after expelling the serum or whey. As David when too young to carry arms, was able to run to the camp with ten cheeses, ten loaves, and an ephah of parched corn, the cheese must have been very small.

**PRELIMINARY REMARKS.**—As butter is formed from the oily part of milk, cheese is composed of the curd or caseous portion. The perfection of cheese-making consists in separating the curd and butter in one mass from the water and sugar: these last ought to be wholly taken out in the whey. In well-made cheese, such as the North Wilts, Cheddar, and some double Gloucester, this is effectually performed—as may easily be tested by toasting: whereas in many Cheshire, and particularly rich American cheese, the casein and butter are found to part when toasted. Age also causes this separation. The strong flavour of Cheshire cheese is attributable to the whey not being so well expressed as in the North Wiltshire, Gloucester, Cheddar, &c. Using too strong rennet, or putting the latter to the milk whilst too hot, produces the same effect. It is acknowledged by all who are acquainted with the subject that the quality of cheese is not wholly dependant on the richness of the soil nor the fineness of the herbage, for cheese of the first quality is sometimes made from inferior land, and by no means unfrequently from coarse herbage; neither does it depend on the breed of cows; differences of attention to the milk in converting it into cheese, and subsequent treatment, also having regard to the quality and quantity of food given to the cows, are the main sources of diversified flavours.

It is injurious to the quality of cheese to allow cows to feed on rotting grass and ill-flavoured hay, or permitting them to run and heat themselves, driving them far

to be milked, and allowing it to stand long after being milked before it is set with rennet.

Everything in cheese-making depends on the dairymaid, and should in all possible cases be executed or superintended by one of the family—the farmer's wife or daughter. The management of the dairy should be conducted with the greatest regularity, every operation being performed at the proper time; hastening or delaying any matter may cause an inferior cheese to be made from milk of which, with proper attention, one of the best might have been made. The mode of making cheese in different districts, though in the main points apparently the same, is subject in practice to a greater variety of minor details than anything formed of one material; thus, many different qualities are brought to market, each bearing some distinctive character.

**COMPOSITION OF MILK AND CHEESE.**—Milk consists principally of casein (or cheesy matter), butter, and sugar. The following is the composition of fresh milk obtained from three domestic animals:

	COW.	EWE.	MARE.
Casein.....	44.8	45.0	16.2
Butter.....	31.3	42.0	trace.
Sugar of milk.....	47.7	50.0	87.5
Salts.....	6.0	6.8	} 896.3
Water.....	870.2	856.2	
	1000.0	1000.0	1000.0

SKIMMED MILK, ACCORDING TO BERZELIUS, CONSISTS OF

Water.....	928.75
Curd not free from butter.....	28.00
Sugar of milk.....	35.00
Lactic acid and lactate of potash.....	6.00
Phosphate of potash.....	0.25
Phosphate of lime and magnesia, with a trace of iron.....	0.30
	1000.00

COMPOSITION OF FOUR DIFFERENT KINDS OF CHEESE.

	Skim Milk.	Dunlop.	Cheddar.	Ewe Milk.
Water.....	43.82	38.46	36.04	40.13
Casein.....	45.04	25.87	28.98	33.48
Butter.....	5.98	31.86	30.40	19.80
Ash or saline matter.....	5.16	3.81	4.58	6.59
	100.00	100.00	100.00	100.00

The quantity of casein in milk appears to be intimately connected with the nature of the food given to the animal, and as it, or the butyaceous portions preponderate, will the resulting cheese be found rich or poor; it is not, therefore, surprising to find good toasting

cheese produced from comparatively poor pasturage, as well as from rich herbage: as examples may be adduced the Derbyshire and North Staffordshire cheese.

It has been remarked in Cheshire, and, I believe, in other extensive cheese districts, that it is impossible to make cheese of the first quality of milk obtained from cows fed upon tares and clover; notwithstanding which I had pointed out to me a farm on which the whole of the cows were fed almost exclusively during the summer on tares and clover, the entire produce of which dairy was converted into cheese, and that of a quality so excellent, that it always obtained the highest price from the London dealers at the Chester cheese fairs. The circumstance was mentioned to me as an illustration of what could be accomplished by management, the dairy-woman being esteemed one of the best hands in that celebrated cheese-making county. My own convictions are that mere manipulation had little to do with it. The best cheese is a compound of cheese and butter. When the cattle were fed *at large* on leguminous food, rich in casein, that substance greatly preponderated in the milk, the butter being partly consumed by the animal in the course of the exercise requisite to procure its food, &c.; when fed *in the house* with the like food the butter was necessarily yielded in a greater proportion, and consequently formed a rich fat cheese.

RENNET is the substance with which the cheesemaker "breaks" the milk. It is formed from calves' stomachs, technically termed "vills;" those obtained from Ireland are preferred. The reason for this preference is not generally known, and may therefore be here stated. The greater part of the calves in Ireland are killed before they are three days old, the stomachs of these "slink calves" are said to be much more powerful in breaking the milk than if older. Vills of more mature growth are however used.

COLOURING. — Cheese is coloured by using a substance called annatto; the kind called roll annatto is that which ought to be employed: the quantity is regulated by the richness of the milk, and the height of the colour desired. If much cream has been taken from the milk, a proportionate additional amount of annatto will be required to obtain the required colour. In Cheshire one pound of good annatto is deemed sufficient for a ton of cheese; in Gloucester double that quantity is used. It would be well if public taste would so far change as to prefer uncoloured cheese, as the Cheddar, Stilton, &c. When colouring is used, a piece of annatto of the required size is folded in linen, and placed over-night in a half or quarter of a pint of warm water, to dissolve; this infusion is poured into the milk; the linen bag is also dipped in, and squeezed until the colouring is discharged.

ANNATTO is the produce of the *Bixa Orilana* of Linnaeus. It is manufactured in two forms, one in flags or cakes of 2 to 3 lbs. each, of a bright yellow-colour, soft to the touch, of good consistence, and comes from Cayenne wrapped in banana leaves, and is much used in giving a fugitive orange tint to silk and cotton goods; the other kind is called roll annatto, which is small, not exceeding 2 or 3 oz. each, hard, dry, and compact, of a

brownish colour outside, and red within, is brought from Brazil, and is the kind which is, or rather ought to be, used in dairies.

CHESHIRE CHEESE.—The county of Chester has been famous for a long period for its excellent cheese. It is stated that the Countess Constance of Chester (reign of Henry II., A.D. 1100), though the wife of Hugh Lapus, the king's first cousin, kept a herd of kine, and made good cheese, three of which she presented to the Archbishop of Canterbury. Giraldus Cambriensis bears honourable testimony to the excellence of the Cheshire cheese of his day.

MODE OF MANUFACTURE.—The colouring and rennet having been put in the milk, it is well stirred, and left to coagulate. The tub is now covered up, either with a wooden lid, or with cloths supported by the cheese ladder; this preserves the heat of the milk, and protects it from dust and dirt. The coagulation or "coming" is generally effected in an hour or an hour-and-a-half. The "breaking" and "gathering" of the curd is the next process; this is now generally done by the curd-breaker, made of wire-work of an oval form, and has a tin rim round it about an inch-and-a-half broad. The wire-work cuts the curd, by being passed through it perpendicularly in different directions, extremely gently at first, to separate the mass into very small portions. The length of time required depends upon the quantity of curd; for a 60lb. cheese it occupies from 20 to 25 minutes; after this the curd is left for a quarter of an hour to separate from the whey; if the weather is cold the tub is covered to retain the heat; the curd being separated and a portion of the whey taken out, it is gently broken by the dairy-maid and her assistant, by passing their hands to the bottom of the tub, buoying up each time a portion of the curd, and using the curd-breaker. This operation occupies half-an-hour. At the expiration of another half hour, (or as soon as the curd is sufficiently settled,) it is drawn as much into one-half of the tub as its loose texture will admit. A semi-circular board adapted to the size of the tub is now placed in the curd, to which a weight of about 30 lbs. is added. This board is perforated with holes, about half-an-inch in diameter, to allow the whey to escape. The tub is then set a few inches "a-tilt" to drain the whey more readily. The whey is passed through a sieve to collect any curd which may remain in it. The weight and board are shortly taken off, and such part of the curd that has been squeezed under them is collected at one side, and a heavier weight of 50 or 60 lbs. applied. In the course of a quarter of an hour the board is again removed, and the curd cut across at 6 or 8 inches apart, to assist the discharge of the whey, and heavier weights (112 lbs.) added; these weights are sometimes increased, always observing that the pressure is gradual and regulated by the compactness of the curd, otherwise a portion of the butter will be squeezed out. The curd is again cut into square pieces, taken out of the cheese-tub and broken a little by the hands as it is passed into the "thrusting-tub," when the extraction of the whey is continued by the application of the screw or lever press. To assist still further the discharge of the whey, long

irons skewers are introduced through the perforations in the tub, with their points directed upwards, so that when the skewers are withdrawn there remains an opening for the whey to drain. The curd is now cut through by intersections of 2 or 3 inches apart, drawn by a large dull knife, so as not to injure the cheese-cloth, and the edge or corner of the curd is cut off all round and placed in the centre. After this the pressure is again applied and skewered as before; at the lapse of 15 or 20 minutes the curd is taken out of the tub, cut into 4 or 5 pieces, each piece broken separately by the hands into pieces 2 or 3 inches square. These operations are repeated until the whey is sufficiently extracted to admit of salting. Previous to salting the curd is cut into three or four equal sized pieces, each of which is broken into smaller pieces by hand, or passed once through the curd-mill, the salt is then scattered over it, and the "breaking" continued either by the hands, the curd-mill, or both, until the salt is well intermixed, and the curd perfectly crumbled; as broken it is placed in the cheese-vat and comparted as much as possible by the hands, to be properly pressed; the vat should be overfilled and rounded up a little in the middle. The vat is again placed in the press and skewered. In the course of an hour it is taken from the press and turned, after which the pressing is continued for half-an-hour or an hour; it is now fit for removal to the stone or most powerful press, in which it is occasionally skewered and turned for about three days, after which a pressure is imposed equal to 30 cwt. to 40 cwt. On the fourth or fifth day it is usually removed to the salting and drying room; here salt can only be applied externally; after some time it is removed to the drying-room.

Cheshire retains its celebrity for cheese-making; the pride of its inhabitants in the superiority of its cheese may be gathered from the following provincial song relative to the subject:—

A Cheshire-man sailed into Spain,  
To trade for merchandise:  
When he arriv'd from the main,  
A Spaniard him espies,  
Who said, "You English rogue, look here—  
What fruits and spices fine  
Our land produces twice a year!  
Thou hast not such in thine."

The Cheshire-man ran to his hold,  
And fetch'd a Cheshire cheese,  
And said, "Look here, you dog! behold,  
We have such fruits as these!"

"Your fruits are ripe but twice a year,  
As you yourself do say;  
But such as I present you here,  
Our land brings twice a day."

The Spaniard in a passion flew,  
And his rapier took in hand;  
The Cheshire-man kicked up his heels,  
Saying, "Thou'rt at my command!"

So never let a Spaniard boast,  
While Cheshire-men abound,  
Lest they should teach him, to his cost,  
To dance a Cheshire round!

The above song, with the music prefixed, was published about the year 1746, during the celebrated Spanish war in the reign of George II.

GLoucester-CHEESE MAKING.—The processes

adopted in the manufacture of every variety of cheese are necessarily much alike; yet upon very minute differences of details, important results follow. The following resumé of the Gloucester mode will, no doubt, prove interesting: The cheese-tub being put in its place in the dairy, the ladder is placed across it; and a large thin canvas cloth is thrown over the tub and ladder, so as to cover both, in order to catch any milk which may drop from the pail, and to prevent dirt falling into the tub. Above this, and upon the ladder, is placed the sieve through which the milk is strained. If the milk should not be of a temperature of 85 deg., a portion of it is placed in a deep tin kept for the purpose, and placed in a boiler used as a hot-water bath, by which means the whole is warmed to a proper degree. It is considered of the utmost moment to attend to this; for if the milk is not warm enough when the rennet is put into it, the cheese will be "tender," and bulge out at the edges, which spoils its appearance; and a great quantity of sediment of small curd will subsequently be found in the whey-leads, being so much curd lost. If, on the other hand, the milk is too warm, it will cause the cheese to "heave," or ferment, which is injurious both to its quality and appearance. When the milk is sufficiently warm, the colouring and the rennet are put into it. One pound of annatto is considered sufficient for half-a-ton of cheese. The rennet is added immediately after the admixture of the colouring ingredient. The tub is then covered with a woollen cloth for at least an hour. When the curd is sufficiently firm for breaking, it is gently and slowly cut across at right angles with a three-bladed knife, about fourteen inches long, close to the bottom of the tub, and around its sides. The cuts should be about an inch apart. When it has stood five or ten minutes, to allow it to sink a little, that the whey may come out as clear as possible, some of the whey is taken out with a bowl, and the curd is cut a second time—very slowly, to begin with. If the cutting is done hurriedly, a considerable sediment of very small curd will pass through the sieve, and be found in the whey-leads: at the same time, a quantity of butter will escape, thus impoverishing the cheese. As the operation proceeds, the cuttings are made more rapidly, and at a less distance. Lastly, one hand, with the skimming-dish, keeps the whole in motion, turning up the lumps suspended in the whey, while the other, with the knife, continues cutting them as small as possible. This continues until no more lumps are brought to the surface, the whole mass being reduced to one degree of firmness. This occupies about a quarter of an hour. The curd being now allowed to "stand" for a quarter of an hour, to settle, and the whey being in a great measure taken out, the dairymaid commences folding over a portion of the curd, beginning at one corner, also cutting the curd into lumps, and laying them on the principal mass; by which means the major portion of the remaining whey exudes from between the cut portions. From time to time, as it accumulates, the whey is taken from the tub. The curd is now placed in vats, and pressed with the hand, these vats being, in the first place, covered with fine

canvas, are placed in the press for half-an-hour, at the expiration of which period they are taken out, and the curd cut into slices, and put into a mill fixed on the top of a tub, which tears it into particles as small as vetches. Some scald the curd in this pulverized state with hot whey: others at once place it in the vats, pressing it closely with the hand in filling, in order to squeeze out any remaining whey, the vat being filled with curd, and rounded up in the middle, as far as the whole can be pressed into the vat. Cheese-cloths are then spread over the whole, and a little hot water sprinkled over the top. This operation has a tendency to harden the outside of the cheese, and prevents it from cracking.

The curd is now turned out of the vats into the cloths, and the vats are dipped into the whey to wash out any crumbs of curd which may cling to them; the curd with the cloth around it being inverted, is again placed in the vat. The cloths are then folded over, and tucked in, and the vats, as they are filled, are put into the press one upon another. The bottoms of the vats are smooth, and a little rounded, so as to answer the purpose of churn-boards, which are only wanted for the uppermost vats, or when the other vats are not quite full. The vats are allowed to remain under the press about two hours, when they are taken out, and dry cloths are applied, which with double Gloucester cheese should be repeated some time during the day. In this state they are removed to the salting press; they are generally salted at the end of twenty-four hours. The salting should not commence until the skin is all closed, for if there is a crack in the skin of the cheese at the time of salting it will not close afterwards. The salting is performed by rubbing both sides and the edge of the cheese with finely-powdered salt; after which they are returned to the vats and put under the press, the newest cheese being placed lowermost and the oldest uppermost. The salting is repeated three times with the single, and four times with the double Gloucester, twenty-four hours elapsing between each salting. After the second salting, the cheese are returned to the vats without cloths, so that the marks of the cloths may be effaced. Double Gloucester remains in the press five days, and the single four, but in damp weather they should remain longer. The quantity of salt used is about three pounds and a-half to one hundred-weight of cheese. When taken from the salting process, they are placed on a shelf in the dairy for a day or two, prior to removal to the cheese-room. In the cheese-room they are turned once a-day on the floor, or on the cheese-rack. In about a month they are ready for cleaning, which is done by scraping both sides and edges; after which it is covered with red paint, made of Venetian red and small beer. It is rubbed on with a woollen cloth; they are subsequently turned twice a week, and oftener in damp weather, until fit for market.

NEW CHEESE, in some places called "slip-coat," is only made in the early part of summer, when the cows are turned out to grass, and is formed entirely of new milk, with a portion of warm water added before the rennet is put to it. The whey is then gently poured off,

and the curd is carefully kept entire until put into a chopart of considerable diameter, but only one or two inches in depth; it is very gently pressed with a weight of two or three pounds for a few hours only, and when removed from the vat is covered with a cloth which is frequently changed. As soon as the skin is formed, it is considered fit for use. This kind of cheese is known in the London market as "Cottenham Cheese."

SKIM-MILK CHEESE is made of milk from which the whole of the cream has been taken. It is more or less palatable according to the time the milk has been allowed to stand; for if deprived of the whole of the butter, the cheese becomes exceedingly hard in a short time; when consumed before it becomes very hard, it forms a wholesome food for working men.

CREAM CHEESE ought to be made from the entire cream, but this is seldom the case, the greater part of the cream-cheese usually sold being made in the same manner as the new cheese already described, and often of the overnight's milk with the cream taken off. The finest cream-cheese we ever met with was made in the East Riding of Yorkshire.

PARMASAN CHEESE.—The country between Cremona and Lodi comprise the richest part of the Milanese. Irrigation is here brought to the highest state of perfection. The grass is cut four times a year as fodder for the cows, whose milk is converted into the well-known Parmasan cheese. The cows are kept in the stall nearly all the year round, and are fed during the summer on two of these crops of grass or clover, which are cut green, and in the winter on the hay made from the other two cuttings. The milk of at least fifty cows is required for the manufacture of a Parmasan cheese. As one farm rarely affords pasture for such a number, it is usual for the farmers or metayers of a district to club together. The milk of fifty, sixty, or even one hundred cows is brought to the farm where the dairy is fixed; the person on whom devolves the task of making the cheese keeps an account of the milk received, and the produce of the cheese is afterwards proportioned accordingly. In this fertile plain, a farm of sixty acres is considered a large one. These farms are divided into fields of three or four acres, for the convenience of irrigation, a practice which in the course of a few years impairs the quality of the grass to such a degree that it becomes necessary to discontinue it. The ground is ploughed in autumn, and in the following spring sown with hemp, which grows luxuriantly. After the hemp is pulled, leguminous plants are sown, which is followed by oats, wheat, maize, wheat. The richness of the soil being now sufficiently subdued, the ground is left to itself, and is immediately covered with herbage, and is again continued in grass for about fifteen years.

NEUFHATEL AND GRUYERE CHEESE are manufactured in a similar joint-stock manner to the above.

GOUDA, EIDAM, AND FRIESELAND are Dutch cheese manufactured in the same way that English cheese is made.

## THE LINCOLNSHIRE SYSTEM OF HOUSING YEARLY AGRICULTURAL SERVANTS.

It is a commendable feature in the proceedings of the London Farmers' Club that the members are continually considering the ease of the Labourer. In November last they once more met to discuss his moral and social condition; while two subjects on the card for the present year are devoted to his interest. It would be idle not to suppose but that these repeated deliberations must gradually result in some good. It is not merely the immediate influence on the speakers and members themselves. The strength of the Club lies rather in its reports, by means of which the whole country becomes alive to the matter in hand. If at any of the meetings a man make a good suggestion or a telling point, it is almost certain to be taken up, in some way or other. On the other hand, if he make a mistake, or advocate a false principle, he is nearly as sure to be taken up himself. The Club works, in fact, with the eyes of England upon it.

The May discussion was, or should have been, confined to one especial phase in the life of a labourer. It was that of the single man—the hind, or annual servant, who years back lived in the house of his employer, and, for the time being at least, regarded the farmstead as his own home. Under any circumstances or in any calling there is no period at which a man is more difficult to manage. With his passions in their full force, without the hold of a wife and family to steady him, and in some respects his own master, he is just in the position to be tempted. At the university, in civil, military, and mercantile life, it is still a grave question how we shall best deal with young unmarried men? How shall we make or mar them at this turning point of their career? It is precisely the same with the agriculturist and his young unmarried men. The custom of providing for them in his own house has gradually, and perhaps wisely, been abandoned. Where else can they be provided for? How can they be weaned from the attractions of the public-house, and be brought to identify their own interests with that of their employer? The difficulty is, of course, susceptible of some very varied solution, according to the usages and relative advantages of different districts. It is only fair, however, to say that it appears to have been very successfully met by the gentleman who introduced the subject at the Farmers' Club. His paper was almost entirely confined to the details of his own practice, and that of the neighbourhood in which he resides. Nothing could have been written in better taste. It was concise, clear, and all to the point. A common but fatal mistake is, that these opening addresses are too long and discursive. That of Mr. Marshall was a very model of what they should be; and it was something more. His plan was practical, reasonable, and alto-

gether encouraging. It will be found that the Club at once adopted it as their own; and we really cannot see why a system carried out with so much mutual advantage in Lincolnshire should not be more generally pursued elsewhere. The well-paid and well-fed labourer in Lincolnshire lives cheaper after all than he could in Essex, and many other counties where any plan for boarding, lodging, and maintaining yearly agricultural servants is comparatively unknown.

We shall leave this plan to speak for itself, only concurring with the resolution in "recommending it to the best consideration of landlord and tenant." It appears after all to be the only really feasible means for dealing with the single man's position. As a rule he must not be the one lodger in another labourer's cottage. Nothing leads to so much immorality. In fact, there is a wholesome proviso fast coming to be recognized, that a cottager shall not take lodgers. As another rule, or something very like it, the agricultural servant does not affect model lodging-houses. In meeting his case they have been, so far, almost everywhere failures. Mr. James speaks to one at Clevedon, in Somersetshire, with accommodation for eleven men, and not a farm-servant in it. Mr. Baker refers to one in Essex, erected at great expense, which was "altogether unsuccessful;" as well as to others in the same county which were "totally useless." Even Mr. Cheffins, who very kindly designed and submitted a plan of a Labourers' Lodging-house to the meeting, could show so far but little evidence of their approval by those for whom they were intended. His chief reference, Mr. Bramston, has room for eleven, "but at present only three lodgers;" while Mr. Baker anticipates that Mr. Bramston will eventually do no better than others have done before him. The single man, then, is not to live with another labourer, and he will not live in a lodging-house. What good scheme is there beyond these to compare with Mr. Marshall's? We repeat that we do not see that difficulty in introducing it in other quarters which some speakers at the meeting appeared to entertain. Wages may not, perhaps, be so high as in Lincolnshire, but then there is no necessity for carrying the thing out on so high a scale. Mr. Marshall's men by comparison, with their meat three times a day, live like princes, while many who earn within a shilling or two of what his do, live like paupers. It is the system, the principle, which is the secret of success; and it is this which we want to see tried elsewhere. Let it be remembered the labourers themselves take kindly to it; and there is no one, after all, more delicately sensitive than the country working man. He has an especial horror of being made a show of, and exhibited in his own home, like the hounds in the kennel, or the children at the school, by the good Lord or Lady Bountiful. This we believe to be one great cause of the

non-success of the model lodging houses. We wonder how often, on the other hand, Mr. Marshall's men have been turned out for inspection? Not a great many times, we will answer.

We could almost wish the discussion had been confined a little more to the subject as it stood on the card. Of course, everybody has something to say about the working classes, particularly people who talk for the sake of talking. The yearly agricultural servant, however, is one whose case is well worth individually considering. It has many advantages for both master and man, even beyond the living and lodging. The two under this agreement must come to a better understanding and appreciation of each other. Mr. Trethewey touched forcibly on this point:—"He

thought it very unjust to treat a labourer just as you would treat a tool. One often found labourers taken on for two or three days, and then discharged. The effect of this was, that they lost all interest in their employer." Of course they did. But Mr. Marshall's practice remedies this. Such annual hirings make a man feel that he will be cared for and respected. As conducive to such a feeling, we would still prefer seeing a man standing with a knot of whipcord in his hat, to having him "treated as a tool," and just put on and off for the job of a day or two, or a week or two, as he may be wanted.

The discussion, often irrelevant enough, was tolerably well sustained. At the same time its value is chiefly dependent upon Mr. Marshall's excellent paper.

## ON SOME POINTS IN THE COMPOSITION OF WHEAT GRAIN, ITS PRODUCTS IN THE MILL, AND BREAD.

By J. B. LAWES, F.R.S., F.C.S., AND J. H. GILBERT, PH. D., F.C.S.\*

This paper discussed an extensive series of experiments, in which wheat-grain and its products were traced from the field to the bakery, the results being given in numerous tables. The first of these gave a summary of the results of the growth of wheat for ten years consecutively, on the same land, and illustrated the influence of variation of climatic circumstance from year to year in one and the same locality upon the general character and composition of the crop. The conclusion the authors arrived at was that, within the limits of their own locality and climate, the season yielding the admittedly best character of grain, also afforded a high per-centage of dry substance in the grain, and comparatively low per-centages both of mineral matter and of nitrogen in that dry substance. The straw showed variations in these same points of composition generally somewhat in the same direction as the grain, but subject to a wider range of exceptions than the latter in this respect.

The influence of various conditions of manuring upon the character and composition of the crop was next considered. With this view, the results obtained upon individual plots during the same ten years were now given, instead of the average from many plots in each year, as when the effects of season alone were to be discussed. In the experiments illustrating the effects of manures, there was pretty generally a slight increase in the per-centage of nitrogen in the grain grown by an annual excess of ammoniacal salts, compared with that grown by its side on land which was continuously unmanured. In the average of the seasons, however, there was a somewhat lower per-centage of nitrogen in the grain, where there had been a liberal supply of the required mineral constituents also, than where the ammoniacal salts were used alone. The range of difference in the per-centage of nitrogen in the produce in one and the same season was, however, even with these extreme variations as to the available supplies within the soil, not nearly so great as it was in different seasons with one and the same condition of manuring.

Twenty-three analyses of wheat-grain ashes were next

recorded; nine referring to grains grown by different manures in 1844, eight to similarly varying specimens the produce of 1845, and six to as many of 1846. From these it did not appear that the per-centage of any particular constituent of the ash of the ripened grain was directly affected by the liberal use of it in manure. At any rate the differences, if any, due to this cause, were within the limits of the ordinary errors of analysis. Here again, however, the effects of varying season were more marked than those of various manuring. Thus it was shown, in a summary-table of the results of the ash-analysis, that the difference in the per-centage amount of almost every constituent was much the greatest among the several grain-ashes of 1845, which was a very bad ripening season, and much the least among those of 1846, which was the best maturing season of the three included in this comparison. It would thus appear that, other things being equal, the more favourably and perfectly matured the grain, the more constant would be the composition of the ash, and the less any direct effect upon it, from the mineral supplies by manure. Taking together the mean of the twenty-three analyses of the ashes of grains grown at Rothamsted, and that of twenty-six analyses of wheat-grain ashes published by Mr. Way, it appeared that this ash consisted essentially of phosphates of potash, magnesia, and lime. The phosphoric acid amounted to nearly 50 per cent, the potash to about 30, the magnesia to from 10 to 12, and the lime from  $3\frac{1}{2}$  to 4 per cent. in the crude ash. The remainder, excluding adventitious sand and charcoal, consisted of small but variable amounts of soluble silica, peroxide of iron, and soda or chloride of sodium, with, according to Mr. Way, occasional traces of sulphuric and carbonic acids also. Soda or chloride of sodium seemed to abound much more in the ash of the less favourably ripened specimens; and the results afforded no reason for supposing that soda could take the place of potash as a constituent of the ash of fully-developed grain.

In selected cases, quantities of the experimentally-grown grains—namely, seven lots from the produce of 1846, nineteen from that of 1847, and two from that of 1848—were carefully watched through the milling process. In some of

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the cases nine, and in others seven, different products of the dressing apparatus were separately taken. The proportion of each of the several products in the respective grains was ascertained and recorded; and the per-centages of dry substance and mineral matter were also in every case determined. The three first wires of the dressing machine gave, on the average, rather more than 70 per cent. of the grain as fine flour; but in practice, about 10 per cent. more would be obtained from the next two products, yielding in all 80 per cent. or more of pretty good bread flour. The average amount of dry substance in the various mill products was about 85 per cent.; the external or more branny portions containing rather more, and the finer flours rather less. The per-centage of mineral matter varied very much in the different products; it being scarcely three-fourths of 1 per cent. in the fine flours, and ten times as much, or more than seven per cent., in the coarsest bran. From the much larger proportion of flour than bran, however, it resulted that rather more than one-third of the total mineral matter of the grain would be accumulated in its currently edible portions.

In one series of these mill-products, from the finest flour at the head of the machine, down to the coarsest bran, the nitrogen was determined, and also some of the constituents of the respective ashes. It appeared that the per-centage of nitrogen was about once-and-a-half as great in the bran as in the finer flours; and, even including all the currently-edible portions, still the excluded branny parts contained considerably higher per-centages of nitrogen. Turning to the ashes of the respective mill-products, there was a much larger proportion of matter insoluble in acid in those of the finer flours than in those of the coarser brans. Of the phosphoric acid, on the other hand, there was considerably the higher per-centage in the ash of the brans. The magnesia, also, was the higher in the ash of the brans; and the potash and lime the higher in that of the flours. Looking to the distribution of the various constituents, according to the average proportion in the grain, of each of the several mill-products, it appeared that about three-fourths of the total nitrogen, and about one-third or two-fifths of the total mineral matter, were accumulated in the usually-edible flours; and of the total phosphoric acid there was only about one-third in the ashes of the latter. Notwithstanding the higher per-centage of nitrogen, and the large actual amounts of the mineral constituents of the grain contained in the branny portions, the authors were of opinion that, besides the information at present at command as to the character and condition of the nitrogenous constituents of the bran, such were the effects of the branny particles themselves in increasing the peristaltic action, and thus clearing the alimentary canal more rapidly of its contents, that it was questionable whether, frequently, more nutriment would not be lost to the system by the admission into the food of the imperfectly-divided branny particles, than would be gained by the introduction into the body, coincidently with them, of the larger amount of supposed nutritious matters. The action alluded to might, indeed, be conducive to health with those of a sluggish habit, or who were overfed; but with those who were not so, the benefits derivable from an already perhaps scanty diet would be but still further reduced.

Experiments were also described, in which several lots of the experimentally-grown wheats were ground in a colonist's steel hand-mill. The results of the examination of the products thus obtained were, in the main, consistent with those from the products of the ordinary mill. They

showed, however, more strikingly the effects of mechanical means in separating different chemical compounds, within the limits of the floury part of the grain.

Experiments were next adduced, in which the different edible products from grains grown by different manures or in different seasons, were made into bread; the several products of the dressing machine being employed sometimes separately and sometimes collectively. The result obtained was that, comparing with each other the three separate products, which together yielded a fine flour, that at the head of the machine (which was the least nitrogenous) yielded, on the average, the least weight of bread for a given amount of flour—that is to say, it retained the least amount of water. Again, when the three products were mixed together, the flours of the season of 1846, which were the less nitrogenous, gave the less weight of bread—that is, retained less water than those of 1847, which were rather the more nitrogenous. The effect of an increase of nitrogen in augmenting the weight of bread was, however, not observable when this increase was due to including more of the more branny portions of the grain. The average yield of bread, in 22 experiments with the individual products, was rather more than 135 for every 100 of flour—equal to about 63 per cent. of dry substance, and 37 of water, in the bread. The average of 19 experiments with fine flour, composed of the products of the first three wires, mixed together, gave a produce of about 137½ of bread for every 100 of flour; and about 61½ of dry substance, and 33½ of water, in the bread. Bakers' loaves were next examined. Of these, four (obtained from different bakers in the country) gave an average of about 62 per cent. of dry substance, and 38 of water, in the bread; and three procured in London, rather more than 64 of dry matter, and rather less than 36 of water. The authors concluded that from 36 to 38 per cent. of water was, perhaps, the best average that could be assumed for baker's bread, within 12 hours of its being withdrawn from the oven. They showed, by reference to a table of the results of other experimenters, that this agreed pretty well with the determinations of some of the most recent and trustworthy. Others, however, gave the water in bread as much higher; and all seem to agree that it was generally higher in country bread than in that of towns and cities.

The point next illustrated was the general influence of locality and varying climatic circumstance upon the per-centage of gluten in wheat-flour. It appeared by the numerous results adduced, that other things being equal, there was a tendency to an increase in the per-centage of gluten, proceeding from the north to the south—a point which was illustrated in specimens both from the European and American continents. A comparatively high ripening temperature was indeed, among other circumstances, favourable to a high per-centage of gluten. There were, however, interesting exceptions to this generalization; at any rate so far as the per-centage of the *nitrogen*, if not of the gluten itself, was concerned. Direct determinations of nitrogen, in numerous pairs of specimens contrasted as to locality, had, however, led to conclusions perfectly consistent, in the main, with those to which the quoted results as to gluten had conducted, whilst the results of others pointed in the same direction.

The foreign wheats containing a high per-centage of gluten, which were generally ripened under a high temperature, had the undoubted character of yielding a flour of great "*strength*," and retaining a considerable amount of water in the bread. Owing, however, to their frequent

hardness, and the peculiarity of their structural character generally, which rendered them both refractory in the mill, and less fitted to make an easily-workable dough, and a bread of the desired colour, texture, and lightness, they are less valued to use *alone* for bread-making purposes than many grains of less *per-centage* of gluten, provided only that they are in an equal condition as to maturation or elaboration of their constituents. Some of the most approved foreign bread-flour grains in the market had, indeed, a comparatively low *per-centage* of nitrogen, but apparently a very high condition, of both their nitrogenous and non-nitrogenous compounds, as well as a very favourable relation to each other of these two classes of constituents. Within the limits of our own island, again, on the average of seasons, the better-elaborated grain would probably be the less nitrogenous; though the nitrogenous matter it did contain would be in a high condition as to elaboration, and as to its mutual relations, structural and chemical, with the other constituents of the flour. Hence it came to pass, that as our home-grown flours go, those which were the best in the view of the baker would frequently be those having a comparatively low *per-centage* of nitrogenous compounds—a higher *condition* more than compensating for the higher *per-centage* of nitrogen, generally associated as it was in our climate with an inferior degree of development and maturation of the grain.

It was further maintained that the high *per-centage* of nitrogen or gluten in wheaten-flour was no more an unconditional measure of value to the *consumer* than it was in the view of the baker.

In illustration of this latter point, a table was given showing the relation of nitrogen to carbon in a number of current articles of food. It was submitted that the underfed or chiefly bread-fed working-man would, as his means increased, generally first have recourse to the addition of

bacon or other highly-fatty matters, which, though they might increase the actual amount of nitrogen consumed, would seldom increase, and frequently decrease, the *proportion* of the nitrogenous or flesh-forming to the more exclusively respiratory and fat-forming constituents. Indeed, so large was the amount of fat, and therefore of respirable hydrogen, as well as respirable carbon, even in fresh meat itself, that, by its use, the proportion of the nitrogenous to the other constituents would be much less augmented than might be generally supposed. Further illustrating the point by reference to the average relation of nitrogen to carbon in numerous dietaries, in many of which meat was included, and therefore fat with its respirable hydrogen as well as respirable carbon, the authors concluded that, independently of cookery, that which was admitted to be a superior class of diet was distinguished much more by including a certain amount of the more peculiarly respiratory and fat-forming constituents, in the condition and state of concentration as in fatty matter itself, and of the nitrogenous ones, in the high condition as in animal food, than by the higher proportion of the flesh-forming, to the more exclusively respiratory and fat-forming constituents.

Finally, in an appendix was given a tabular form, showing the relation of the yield, and composition of the bread, to that of the flour, according to the number of loaves obtained per sack (280 lbs.) of the latter. And, assuming it to be established that the loss of dry substance by fermentation was less than one, or perhaps less than half of one per cent. of that of the flour employed, it resulted that the gain in the weight of bread by the non-fermenting method was simply a gain in the water retained. Unless, therefore, the unfermented bread were better adapted for digestion and assimilation, or it were sold at a correspondingly lower price, the consumer would be a considerable loser by the purchase of the unfermented loaf.

## THE ECONOMY OF FOOD AS CONSIDERED BY DR. LETHEBY.

The economy of food was the subject of discussion at a recent meeting of the Society of Arts, in a paper read by Dr. Letheby; and a more important topic could scarcely be opened up for discussion, taken in any or all of its relations upon mankind, and the progress of society and civilization. A proper amount of food, and of a good quality, varied to some degree in its nature, to suit the omnivorous appetite of the human race, is essential to health and progress, and the development of the intellectual faculties and muscular action of the body.

In no country, certainly, is there a better supply of food available to the general bulk of the population, and of so wholesome a character too, notwithstanding the outcry of the alarmists, who seek to terrify us with the bugbear of adulteration.

It is true that the home supply of animal and vegetable food scarcely keeps pace with the insatiable demand, and we have to look to foreign sources—to the Continent and to America for extraneous supplies of butter and bacon, lard and eggs, grain and flour, and such like; but still our home producers do much, both

by industry and science, to meet the food wants of the nation.

From our northern and insular position, we must, however, necessarily be dependent upon tropical countries for many of the luxuries and of the necessities we require of tea and coffee and cocoa, sugar, spices, and fruits.

In no country, as we have recently shown, is the consumption of meat—nay, of bread, butter, tea, and sugar—so proportionately large as in the United Kingdom. In the domestic homes alike of the labourer and navigator, of the mechanic and tradesman, or of the upper classes, there is a degree of comfort and competency, of wholesome food, and of the quality best suited to maintain the body in health and vigour, which we look for in vain elsewhere. It may be more expensive in some respects from the competitive demand, from the diffusion of wealth, from the expensive mode in which it has to be brought to market, and other causes; but probably nowhere else will such a variety of superior animal food be accessible to the bulk of the population.



The definition of food is a mooted point, and would certainly be very differently answered in different countries; although, doubtless, the broad definition of "anything that contributes to the sustentation of the animal powers of the body" may suffice. But the kinds of food, and especially what may be termed the food delicacies, will vary greatly in different localities. The Yorkshire cake and the oatmeal porridge might not find favour in the western districts, where parsley, fish, and squal pies are esteemed. The African enjoys his dish of baked elephant's paws and trunk, his pounded locusts for bread or soup, and his lion or tiger steaks. The American Indian does not despise alligator's flesh and eggs, a polecat, or a young monkey roasted. The Chinese revel in bird's-nest soup, sharks' fins, luscious sea-slugs, roasted puppies, and putrid fish and eggs. The Asiatics esteem *asafoetida* as a condiment; while we make wry faces at it, in the shape of drastic pills. The jurors, in 1851, classed tobacco as food; and certainly the friendly pipe stays the pangs of hunger, if it does not fill the stomach, and the 30,000,000lbs. we annually consume prove the universality of the favour in which it is held, the tobacco controversy to the contrary notwithstanding. The Chinese, too, feed upon opium pretty largely, judging from the 80,000 chests, of 140lbs. each, which go there annually from India. The Gaucho of South America eats large quantities of animal food without any vegetable aid; and the Esquimaux, in his littoral wanderings over the barren shores of Arctic America, is also guiltless of the knowledge of vegetable food, reveling in blubber and train-oil, and masticating freely hides and skins. Even the luxuries of more civilized races are rather *recherche*, such as the frogs and snails and horse-flesh and ants' eggs of our continental neighbours. And as for vegetable food, from bark-bread to sea-weed, leaves, grains, roots, fruit—nay, all parts of plants add to the common stock which the omnivorous maw of the human frame devours. The tenants of the sea and air, of the forests—animals wild and domesticated, small and large, are alike made to contribute to the ordinary, or extraordinary, food of man.

The chemical view of the subject of food was that chiefly dwelt upon in Dr. Letheby's paper, and by the speakers who followed him; but there is ample scope for much new and useful information on the production, distribution, and proper appropriation of food, and especially on its preservation and transport to and from different countries. It is but of late that any attention at all has been paid to the different scientific processes for preserving food in a fresh state; and yet this is a matter of the highest importance to large masses in newly settled localities—in the movement of armies and fleets, and in emigrant ships and the mercantile marine. The actual support of thousands, the pre-

vention of scurvy, diarrhoea, and other diseases is dependent upon this question. Concentrated mixed food in a portable form, preserved meats and fish, soups, pemmican or dried pounded meats, desiccated vegetables, sun-dried meats (such as are used in the Cape Colony, Brazil, and the West Indies), condensed egg, solidified milk, preserved potatoes, the preservation of biscuits from the attack of weevils; the general subject of antiseptics, or those materials which will protect animal substances from change or decay, such as charcoal, glycerine, creosote, gelatine casings, &c., are all matters of great interest, which cannot be too often discussed or described; and yet there are few or no specific details for reference on many of these heads. A few patented processes connected with the preservation of animal and vegetable food are in use; but, as a whole, and on a broad scale, the matter has scarcely been dealt with.

With our present limited chemical knowledge, it is as yet impracticable to construct tables that shall at once indicate the nutritive or elementary equivalents of different substances, so that, failing in the supply of one, we shall be able to make it good by the supply of another. And yet wholesale censure is indiscriminately cast upon our Poor-law guardians for the dietary scales adopted in the Union workhouses. Doubtless they have used all zeal and diligence in regulating the due supply of food to the peculiar circumstances of the people and the district. But it is at the best a thankless office to cater for the wants of the poor, who, whatever were the rations furnished, would seldom be found satisfied; for, in the nature of things, each man has his independent and separate tastes and wants, which he would prefer to have gratified. One likes his tea, another his tobacco, a third hates slops, and so on. It may be, as asserted by Dr. Letheby (although denied by Mr. Harries of the Poor-law Board) that the dietary tables of the Unions are too low as compared with the scale of rations in prisons; but we doubt the force of the argument that this contrast is an encouragement to crime, and that when an unusual want presses upon the poorer classes we see the result in the crowding of our public gaols.

There was one division of the subject but incidentally alluded to, and yet it is a very important branch, and deserving of greater attention, namely, the *economy* of food, in the general acceptance of the term; the prevention of waste, and the adoption of a more judicious system of cooking. This point was pressed strongly on the attention of the ladies by the Chairman, who urged the expediency of instruction being given to the wives of the mechanical and labouring classes. Mr. Soyer has done much on this head, and females might greatly aid in economizing food, utilizing much that is now wasted.

## PLOUGHING BY STEAM POWER.

On May 7th, experiments of ploughing by steam power were made in a field near Thetford. Handbills having been extensively circulated announcing the experiments, a great concourse of people came from all parts of the county to the scene of operations. The morning trains from London and Norwich brought numbers of farmers and others, who were set down at the level crossing about two miles on the Brandon side of Thetford, whence they walked to the field, belonging to Craske Roper, Esq., of Croxton Park.

For some years past Mr. Boydell, an engineer, has endeavoured to construct locomotive engines available for dragging heavy weights on common roads and for agricultural operations. Originally he intended his engines for military purposes, to drag heavy guns over difficult ground, and the first of his engines having been purchased by the Government is now at Woolwich. The second engine that he had built was exhibited, last July, at the Chelmsford show of the Royal Agricultural Society. He had previously obtained a patent for the invention.

The engine was tried with new ploughs invented by Mr. Coleman, of Chelmsford; but the ploughs did not answer, and in fact would not do the work at all. By request of the Emperor of Russia, the engine was sent to that country, but was lost, with the ship in which it was sent, in the gulf of Finland, last October.

A company has been formed in London, called the "Traction Engine and Endless Railway Apparatus Company," to promote the use of Boydell's patent engine and apparatus.

Mr. Burrell, of Thetford, has built two of the engines with some improvements, and both of them were exhibited at work. The new engine is like a railway locomotive, but with the addition of an apparatus, which answers the purpose of a railway attached to the wheels. Distinct from the engine, and in front of it, there is a steering apparatus. The endless railway consists of a series of flat boards, six in number, plated with iron on both sides of each wheel, equal in length to the radius of the wheel, and from 10 to 16 inches in width, loosely attached to the felloe of the wheel, in such a manner that they are carried round with it as it revolves. Each in succession is laid flat on the ground in front of the wheel, and lifted again in its rear as soon as passed over. On the surface of the boards next the periphery of the wheel, an iron rail is fixed on which the wheel runs, the boards thus corresponding to the sleepers of an ordinary railway, so that the wheels carry their own rails and sleepers with them, laying down a literally endless railway whenever they are set in motion. Mr. Burrell's engines are larger than the previous ones. The boiler has a greater heating surface, thus increasing the power, and the steering apparatus is more compact. But the greatest improvement that has been made (patented by Mr. Burrell) is the application of the new wheels with their endless railway to the common portable engines, thus making them locomotives capable of going any distance on roads from place to place, instead of being dragged as hitherto by five or six horses. This improvement is so obvious and important that it is likely to be universally adopted. We saw one of the usual portable engines, with the new wheels, &c. attached, going along the roads in Croxton at a good pace, clump, clump, shrieking and snorting like a mad elephant, to the great amazement of the peasantry. The drivers of gigs had

to get quickly out of the way, and the horses seemed inclined to bolt, or to keep at a respectful distance.

The first experiment with the great engine was drawing an immense weight, a timber gill with a great load, on the common road. This was accomplished for some distance, not far from the railway. The driver of a passing train set up a long whistle, which was well answered by the steam-horse on the road. No doubt the steam horse is well adapted for any roads, even the worst, and it has gone over soft and marshy ground where no roads exist, as proved before a Government Committee. This adds to the importance of the invention, as it removes one of the difficulties hitherto experienced in making road locomotives profitably available. In the southern counties they have been frequently tried, but never with any profit, as they could only be used on very good level roads. But Boydell's steam horse has gone over swampy places, up and down hill, and over rough uneven ground.

The steam horse being ready for use, with more than sufficient power for ploughing purposes, the next thing was to invent suitable ploughs. It has long been admitted that the greater portion of the ploughing in this country might be done by steam-power, and the only question has been whether this should be accomplished by means of stationary engines and ropes or by direct traction. Both systems have been tried, but the question of expense still remains unsettled. At the Chelmsford show Mr. Fowler's plan was the most successful, but now Mr. Burrell has constructed an entirely new description of ploughs, they being double ploughs, taking two furrows at a time, and in the experiments tried they were acknowledged to do the work admirably well. The leading feature of these ploughs is that, instead of its being necessary to throw them down on one side, they can be lifted up by levers at the end of the furrow with rapidity. The same ploughs can be worked with horses, but their chief merit is, that they can be adjusted to a steam-engine.

The field selected for the ploughing operation was about 30 acres in extent, and a sandy soil. A wider space would have afforded greater scope for the engine and ploughs, and better tested the utmost quantity of work that could be done in a given time. A great deal of time was lost in continually turning the engine and ploughs at each side of the field. At the time appointed the engine started, dragging after it three double ploughs, guided by three men. The ploughs were so placed that they made six furrows close together from 12 to 13 inches deep, and the farmers who closely inspected the work allowed that it was done well. The engine went at the rate of nearly three miles an hour, and allowing for the stops at the turnings, an acre was ploughed in 54 minutes, or at the rate of 10 acres per day. The engine might have been driven at a greater speed but for the multitude of people collected round, and who would not keep off the ploughed land at a proper distance. The ploughmen could scarcely see what they were doing on account of the crowd. The trials could not be scientifically conducted, but it was generally admitted that if ploughing by steam could be done well in so limited a space at the rate of 10 acres per day, it might be done far better in a wider space, and at the rate of 15 acres per day.

Whether this can be done at less expense by steam-power than by horse-power is a matter of calculation. "The

*Engineer's* journal thus states the daily expense of the engine :

	£	s.	d.
Engine-man at 4s. per day .. .. .	0	4	0
Steersman and four ploughmen at 2s. 6d. .. .. .	0	12	6
Ten cwt. of coals at 1s. .. .. .	0	10	0
Wear and tear, say .. .. .	0	10	0
	<hr/>		
	£1	16	6

This does not include interest on the capital, or hire of the engine.

A ploughman, with two horses, will plough  $1\frac{1}{2}$  acres in a day, and six ploughmen, with 12 horses, will therefore plough nine acres in a day, and the estimated expense is £1 16s.; consequently all the gain in steam-ploughing is in the quantity over nine acres, without taking into account the cost or hire

of the engine. It should be remembered, however, that the engine is equally adapted for all the purposes of any portable or stationary engine of a similar power, possessing this great advantage over all other engines, that it can speedily convey itself to any scene of operations without the aid of horses.

The other experiments were made with Cotgreave's subsoil and draining ploughs. The work was fairly done, but the soft sandy soil was no test at all, either of the engine or ploughs. Very likely the engine, if tried, would have drawn the ploughs through stiffer soils, and at a greater depth if required. As the engine went along, a great amount of manual labour was required to keep the ploughs down.

Soon after four o'clock the experiments were concluded, and the people rapidly left the ground.—*Norwich Mercury*.

## BREEDING OF LONDON DRAY-HORSES.

SIR,—The speculation of breeding horses of gigantic stature, calculated for the London drays, is always surrounded with considerable uncertainty. It is true that, in breeding all kinds of animals, there is an acknowledged principle—that "like produces like;" and so far as species, and to a certain extent character, is considered, this may apply: yet stature is often governed by circumstances which the most astute judgment can neither foresee nor control.

There are two very important points in dray-horses—namely, size, and a disposition to accumulate fat; and this latter property is as essential as it is in cattle or sheep. To breed horses of gigantic proportions, the first impression that naturally arises, with the uninitiated, is that of procuring mares of great size, and selecting for them partners of still greater magnitude. There is nothing, however, more uncertain in this respect than the produce of very large mares. It not infrequently occurs that a medium-sized—and sometimes, indeed, a small-sized—mare breeds very large foals, and, in the event of one of such offspring being employed as a brood-mare, in the hope that her progeny will be equal to, or perhaps exceed the proportion of the dam, that she gives birth to mean, insignificant foals. It often happens that her produce will in this respect follow their grandam, such is the propensity of Nature to go back to originals. Very large mares will frequently produce one or two foals of great size, and many of insignificant proportions. Hence it is desirable to ascertain the stature and propensities of the family; but that cannot in all cases be accomplished. Good keep—that is, an abundance of rank pasturage—has a great effect on the size; and this is more essentially under the control of the breeder. The heavy-heeled, lethargic mare, of elephantine proportions, is far from being likely to produce foals that will realize great prices as dray-horses in London: but one with a roomy frame; a great body, on short, clean legs; strong shoulders; and vast development in the loins and quarters—put to a stallion of adequate proportions—will probably produce what is required: but, with the utmost caution, success is by no means certain. Some remarks on this subject will be found

in the last edition of Youatt on "The Horse," published by Messrs. Routledge.

There is another class of horses in great request in London, commanding high prices, of lighter make, the breeding of which is less precarious; and they are annually becoming more and more in demand, while the dray-horse is becoming less in vogue. These are employed for working luggage-vans, in connexion with the railway stations, and for other purposes of heavy draught in which great power is required, and, to meet the usage of the times, more activity and pace than the heavy dray or common cart-horses possess. To produce this description of horse, a good-shaped active cart-mare, or a powerful mare of lighter make, is crossed with a sire of the Yorkshire or Cleveland breed. They must have action, and be able to trot at the rate of seven or eight miles an hour. Their height should not be less than sixteen hands. For farming operations, in which they may be advantageously employed prior to the time when they have attained an age to command the top price of the London markets, they are incalculably superior to the huge lumbering dray-horses, which, for agricultural purposes, conducted as they are at the present a year, unwieldy, slow, and useless brutes. They consumed an enormous quantity of food, without which it is futile to expect that their gigantic frames can attain their proper growth; and to make them fat for sale—the indispensable property they must possess—involves an outlay that leaves but an insignificant margin for profit. Yours, &c.,

CECIL.

A large supply of cotton-seed, with exact instructions as to the course to be observed in order to insure its successful cultivation, has been obtained from the great cotton-growing State, Georgia, by his Excellency Sir William Denison, and forwarded since to Lieutenant-Colonel Gray, to be distributed among such of the settlers in the Moreton Bay districts as desire to compete for the prizes of land proposed by the Government to be awarded for the encouragement of cotton-growing in that portion of New South Wales.—*Australian and New Zealand Gazette*.

## BEST TENURE OF LAND.—PEMBROKE FARMERS' CLUB.

The usual quarterly meeting of this flourishing Society was held on Saturday, the 7th of February.

MAJOR LEECH (the Chairman) said that at their last meeting it had been moved by Mr. Lewis that they should discuss at this meeting the subject of the best tenure of land: whether it should be leases or yearly tenancy. He had great pleasure now in calling on Mr. Lewis to open the discussion.

Mr. THOMAS LEWIS said he had the honour that day of introducing this infant to their notice—this offspring of his own—the best tenure of land. He thought it was a very beautiful baby, and if they would only deal tenderly with it, he had no doubt that it would ultimately prove of very great benefit to the community. He should, in the course of his remarks, quote at some length certain extracts from a "Journal of the London Central Farmers' Club" of last year, giving a report of a discussion on "Farm Agreements," which was a subject very much akin to that which they were about to discuss that day. It might not be out of the way for him to read from the "Journal" a few extracts from a speech by Mr. Jackson as to the best "Farm Agreements;" not that he (Mr. Lewis) agreed with the speaker on all points, but he thought that some of his remarks were most important. That gentleman said—

"In endeavouring this evening to solve the great agricultural problem, 'the description of farm agreements best calculated to give a stimulus to agricultural improvement,' we stand on a fine elevation between the past and the future. Experience has lit up for us many valuable beacon-fires to warn us of danger; and science, our Trinity House, has provided us with many aids for future navigation. Without advanced age, our recollections carry us back to the period when agriculture lay apparently neglected in the cradle of its infancy, as though unconscious of its destiny. The babe was, through the ignorance of its nurses, kept in the dark, lest the light of dawning day should cause it to squint; ricketed with tight bandages, for fear it should begin to 'step in life' with crooked legs; but, like a second Whittington, catching prophetic inspiration from the nursery jingle—

'There was an old woman, and what do you think?  
She lived upon nothing but victuals and drink;'

it was, in spite of bad nursing, roused into being, and the 'bairn' lives, but has sadly out-grown his legal attire, except in the estimation of a certain Northumberland dame, who fancies he could be improved by tight-lacing, and strut nicely if his feet were forced into a pair of old-fashioned ladies' shoes, fresh imported from the Celestial Empire. Time was when 'thumb-screws,' 'manacles,' 'pro-

scriptions,' 'pains and penalties,' were implements of agriculture not unbenefitting the feudal condition of serfdom and slavery; and had it not been for 'Moore's New Edition of Vox Stellarum,' we were in danger of concluding that these noble engines of antiquity had all been consigned to the 'Old Curiosity Shop' in the 'Tower,' and the march of intellect and modern science had invented better legal instruments for causing two blades of corn or grass to grow where only one grew 'in the olden time.'"

The remarks which are made in this speech as to the best form of agreements apply with very great force to the subject which they had met there to discuss—the best tenure of land. It might not perhaps be unimportant to glance for a moment at the tenure of land in other countries, and in times long gone by. In Russia—from the earliest dawn of her history, even to the present time—both the lands and the serfs on those lands belong to the nobles: the one is as much property as the other. This was also the case in their own country in former days, even before the time of the feudal system. Amongst their Anglo-Saxon ancestors the tenants of the soil belonged to the owners of the soil. The land and the persons who inhabited it were alike the property of the possessors of the soil. In America it was different; there the land belonged to the parties who either cleared it by their own labour, or bought it from those who had done so. This, as had been proved, was not the best tenure of land; for, although the land belonged to the parties cultivating it, they had not given that care and attention to it which were needful, and so the lands in a few years were run out, and produced very inferior crops indeed. However, reverting again to their own country, and to the time of the Norman Conquest, they found that the Conqueror himself allotted to his followers the lands of the country for service rendered. But this was purely a feudal tenure; there was no rent paid; the land was held in lieu of service rendered, until about the 15th century, when the feudal system was being gradually destroyed, and the present arrangement between landlord and tenant commenced. He could not take a better opportunity than the present of reading a few extracts from a letter from a friend in town, who, having seen it in print that this discussion was to come off, had written to him (Mr. Lewis) giving him some valuable information on the subject. His friend said:—

"The subject for discussion at the next quarterly meeting being the 'Tenure of Land,' it has just

struck me a few remarks on the subject may not be misplaced.

"In regard to the origin of farms, experience soon showed that the owner of a large tract of land, even when he has the requisite capital or knowledge, could not successfully become the great farming merchant of his own acres, or employ them so advantageously as by letting them in subdivided portions to others. The land was long held by payment of services and of produce, and the feudal dominion existed over the goods of the tenant in liability for the debts of the possessor of the soil. This state of things was not removed till near the end of the fifteenth century, when the goods of the tenant were declared not liable for the debts of the landlord, and a tenure for a specified number of years was held good against the successors in the property. These two acts fixed the basis of the position of the tenant, and consequently of the success of British agriculture.

"In the cultivation of land the occupier necessarily employs a capital that is at first floating, and gradually becomes fixed by means of being invested in the soil by increasing its productiveness from operations more or less permanent in their nature. The tenant of land who employs these means most naturally looks to the landlord for the security of enjoying the reward of his labours, and which he cannot with any justice refuse to grant; for he will not himself build a house, make a road, or plant a tree, till the rights of property are securely granted him, and he cannot with any reason expect others to do what he will not do himself under exactly similar circumstances.

"The security should be extended over a time that is sufficient for the development of the intended purpose, which must be calculated in strict relation with the elements on which the action will be exerted. The nature of the productions of land require a much longer time than many other employments in which to repay the cost of cultivation; years are required for each kind of produce to contribute a share of the outlay that has been made. Hence a short tenure is nothing better than a yearly holding; if there is more time to expend, there is very insufficient opportunity to reap the fruits that are grown. 'Give a man the secure possession of a bleak rock,' says Arthur Young, 'and he will turn it into a garden; give him a nine years' lease of a garden, and he will convert it into a desert.' It is not possible to banish from the mind of the tenant-at-will the palpable truth that every improvement he makes on the land is producing a value to others, and, in all probability, raising the rent against himself; he may have a well-grounded and unbounded confidence in the owner of the property that he will not be disturbed, nor denied the fruits of his labours; but he has no knowledge of the successor—a widow in straitened circumstances, who may be compelled to use every means to raise money—a minor under unscrupulous guardians who will stickle at no point in order to accumulate the wealth of their charge—or some prodigal slave of the card table, the dice box, or the turf, who, in order to gratify his passion, cares not for the morrow, nor even for the afternoon of the present day.

"Not only the landlord but the country suffers by the less improved condition of the public territory, from the want of just and fitting tenures on his estate.

"Much land remains uncultivated, or is kept in a very inferior condition of growing grass, which renders security of comparatively less value, as the land requires little expenditure that cannot be replaced within the year.

"The only fitting security for a man who has capital to employ in the cultivation and improvement of land is a written covenant subsisting for a definite and adequate period. The term must be defined in order that the property may not seem alienated, and the period of time must be adequate to draw back, by periodical returns in the lapse of years, the capital that has been expended.

"In a well-considered contract the expression must be so pointedly obvious in the meaning that no doubt can arise on the construction. Two faults are usually committed; a mass of cumbersome and useless restrictions fetter the farmer and cramp his energies, preventing the exercise of judgment, and the power of adapting his practice to the circumstances that may arise. The other omission consists in leaving to the farmer an unrestricted power of proceeding to a degree of management very hurtful to the landlord, and, on every change of tenant, tending to a deterioration of the farm. The midland and western counties of England are oppressed with clauses and enactments that have descended from the practice of olden times, and which either remain a dead letter, or kill the freedom of action that is demanded by an improving condition of the tenant. In Scotland the lease of land has wrought miracles of the kind; a remarkable degree of laxity prevails, and whole estates are managed on a simple letter or a memorandum, with constant reference to the custom of the country.

"If good farming cannot be introduced by the stipulation of a lease, it may at least prevent much that is bad, and, by wholly omitting the notice of exploded practices, room is left to mention the better rules, and to render them compulsory when time has fully sanctioned the superiority.

"The practice of agriculture clings so very tenaciously to old customs, that every possible means must be used to unfetter the bonds and loosen the grasp, and many very useful notices may be made in the small compass of a lease.

"The most eligible duration for a lease has now been fixed by the best experience in the term of twenty-one years. This period has been reckoned a very long term during which to part with the control of property, and lose the advantages that may happen of an increased value, but it has been proved to be in fair accordance with the interests of both parties to allow the possessor to adopt, and use a profitable system of management, and the landlord to derive an adequate rent.

"Trusting the preceding observations, which I have collected from an authentic source, will coincide with your ideas on the subject, believe me to remain yours very truly," &c.

In that county, however, he was sorry to say that there was no fixed custom that they could

possibly allude to, in any case of farm agreement. It would be of considerable advantage to the country if, in any case of dispute between landlord and tenant, the decision could be referred to the custom of the country; but at present there was no such arrangement between landlord and tenant, and they had no fixed custom to refer to. They had, as he said, no such custom now; he hoped they would have it hereafter. But it is a fact that the land in Pembrokeshire wants to be improved; it is capable of being improved, and being improved greatly; but this cannot be done without the mutual co-operation of landlord and tenant. He (Mr. Lewis) had been brought up a tenant farmer, and had spent the greater part of his life amongst tenant farmers, and he knew (he thought so at least) as well as any man what are the necessities of tenant farmers and what they desire. He had also associated extensively with farm agents, and had been honoured to some extent with the confidence of gentlemen—owners of the soil, and he knew therefore what they thought on this question, and what they also desired. He came therefore to this discussion not partial or prejudiced, and should be exceedingly sorry to jeopardize the interests of either landlord or tenant, or place one in opposition to the other. He did not think, however, that that could be done; for their interests are mutual, and by benefitting the one they would necessarily benefit the other. He had been saying that the land of that county was capable of very great improvement, and of great increase in value. Referring only to the estate with which he had the honour to be connected, he could assert that by judicious management it had considerably increased in value of late years; and he had no hesitation in saying that a young man coming into the possession of an estate, say at the age of 28 years, and who might chance to live to the age of 70, would, by granting two leases on his farms each of 21 years' duration, nearly double the value of his land before his death, and leave a much more valuable estate to his successor. By doing this he would confer a more valuable and lasting benefit to those who came after him, than if he had expended half his income in buying up more acres and thus extending his estate. He (Mr. Lewis) contended that more money could be made by improving the lands which gentlemen now possess, than if they were to lay out heavy sums in widening the extent of their property. On this part of the question he would quote from the writings of a gentleman who wrote on the tenure of land some years since—Sir John Sinclair. He said—

“In feudal times, the connexion between a landlord and his tenants was of a military description. The proprietor of an estate was himself

a warrior, and those who possessed land under him were his soldiers, who were bound to military service, and who paid him hardly any rent in money, but only some personal services, and a moderate quantity of some articles in kind for the maintenance of his family.

“When the feudal system was abolished, the landlord, at first, still considered himself as the patron of those who were placed under him. The rents continued low; the occupiers of the estate claimed, from generation to generation, under the name of ‘kindly tenants,’ a sort of tacit patrimonial interest in their respective possessions; and as they paid very inadequate rents, and had no permanent security in their possessions, nothing could exceed their indolence, their ignorance, and of course the poverty of their condition.

“The connexion between the two classes is now of a description totally different. The landlord considers himself as the owner of an estate, of which he must make the most he can for the benefit of himself and family. He lets it for a certain number of years, to persons possessed of skill, integrity, industry, and capital, under the obligation of paying him annually a specific share of the produce converted into money, besides being bound, if not to improve the value of the property, at least that it shall not be deteriorated during the currency of the lease.

“The contract becomes of course more of a mercenary nature, without, however, totally destroying ties of a more pleasing kind; for the landlord, on the one hand, must feel himself deeply interested in the success of his tenant, on which his own income and prosperity materially depend; while the tenant, on the other, looks up to his landlord as a friend, whose interests are necessarily interwoven with his own, and who will naturally be inclined to give an industrious and improving tenant a preference when the farm is to be relet.

“Under this system, it is essential both for the landlord and tenant that the connexion between them should be established on just and liberal principles, so as to induce men of knowledge, enterprise, and capital, to devote their attention to the art of husbandry. That can only be expected where leases are granted. These furnish the most beneficial species of encouragement to agricultural improvements; indeed, if any great exertions are necessary, they are not to be attempted without that security. Where a proprietor, therefore, does not incline to occupy his lands himself, he naturally resolves to surrender the temporary possession of it to others, under such conditions as may be mutually advantageous.

“A lease, indeed, is properly a contract, founded on the principles of equity, between two men for their mutual advantage. The one possesses an absolute right in the property of a certain tract of land and its produce; the other purchases the temporary privilege of appropriating the produce of that land to himself at a certain stipulated price. The proprietor of an estate may thus be considered as in the possession of a certain fixed capital in land, which is capable of producing, when duly cultivated, a certain annual value. The cultivator of the soil, on the other hand, possesses a move-

able capital, consisting of the necessary funds for stocking a farm, his knowledge in the art of agriculture, and his industry. Thus situated, the parties, like other men who wish to enter into a joint concern, are induced, by the prospect of mutual advantage, to agree to unite their capitals, for the purpose of assisting Nature in producing human subsistence; and their respective interests having been mutually considered, their agreement constitutes the terms or specific articles of the lease. On this plain principle depends the connexion between landlord and tenant. The capital invested by the cultivator, the rent he pays, his skill and labour, the contingencies and chance of loss that may arise from the inclemency of the seasons, must all be compensated by the value of the produce of the soil. Where these principles are fully understood and acted upon, both proprietor and tenant will be placed in the most favourable situation of which the nature of the transaction admits; but where these are departed from, the interest of the one or of the other, or perhaps of both, must suffer, in proportion to the degree of aberration from that equitable line, which so distinctly marks their respective rights and obligations."

And as to the terms, he says that 21 years is about a fair term for a lease. His words are—

"On the whole, experience has fully demonstrated that short leases, and those whose duration is uncertain, are injurious to improvements, and that a period of about 20 years is a fair term, in an improved country, for all parties, securing to the proprietor the progressive improvement of his land, and a periodical addition to his income, while it rouses the energy of the industrious farmer, from the certainty of his reaping the profit of his labour, skill, and capital, in consequence of his having a certain interest in the soil he cultivates. The successful practice and experience of Mr. Coke of Norfolk has put this question beyond all doubt, whose rent-roll has been increased, within the memory of man, chiefly by the system of granting judicious leases, from £5,000 to £40,000 per annum, taking into consideration, at the same time, the rise in the value of money for the last 30 years. A prejudice against the granting of leases, therefore, if not removed by the good sense of the landlords, will injure, beyond all calculation, the agriculture of the kingdom. The difference between a lease and no lease, and between a long and a short lease, affects almost every operation that takes place on a farm. Where a regular system of leasing does not exist, not only all improvements are neglected, but a gradual deterioration of the land is the consequence.

"It must not be imagined, however, that leases ought to be indiscriminately given: they certainly ought not to be granted but where a farm of a proper size is put into a shape fit for profitable cultivation. The improvement of an estate may be retarded, instead of being promoted, if leases are given of ill-arranged occupations, and to ignorant, slothful, and needy farmers, not entitled to the confidence of their landlord; nor ought they to be granted without proper covenants to protect that property from waste."

After a variety of other matters of not so much importance, he says, "Hence tenants, like kings,' as Lord Kames remarks, 'ought to be fettered, but not so fettered as to bar improvement, nor left at liberty to do mischief.' Then as to the form of the lease, he discusses this at some length, and he came to the conclusion, with which he (Mr. Lewis) agreed, that there ought to be a certain fixity of tenure, and that there should be certain positive conditions to prevent a tenant doing damage to the land which he occupies. At the Central Club to which he had already referred, there was a great deal of discussion as to the beneficial character of an agreement from year to year between landlord and tenant. A Mr. Jackson thought that upon the whole leases were not so beneficial to the tenant as tenant-right agreements, because the profit in improvements is made more secure to the tenant by this agreement than even by lease. The value of unexhausted improvements is then received by the tenant, not by the landlord. As to the land with which he (Mr. Lewis) had the honour to be connected, all the agreements were of this nature, and tenants receive all the benefit of unexhausted improvements. He might say that tenants never go away; but if they should chance to go, they are always secured from loss by unexhausted improvements; for these they are allowed full compensation. He (Mr. Lewis) thought that whatever be the terms of tenure, no improvements should be allowed to go on at the end of the term. The improvements, as they are called, at the end of the term is styled by the tenant preparing the farm for the landlord. Now this kind of improvement ought not to be attempted on the part of the tenant, because this is one reason why there is shown such great disinclination on the part of the landlords to grant leases. Wherever they saw lands ignorantly, slovenly, or unskilfully cultivated, they may rest assured that in numerous cases it arises from the absence of security to the tenant that he shall receive the value of his improved labour. Now he submitted that this ought not to be on the part of the landlord, and such pernicious farmer might easily be prevented by making an allowance to the tenant for the value of all unexhausted improvements. He had been talking of the beginning and the end of a lease; but they did not practically know much about this in their neighbourhood; for leases in this county are, as a rule, granted for a term of life or lives. The most of their county leases are of old date, and were granted toward the latter end of the last century, and were consequent on the rise of agricultural produce during the wars of Napoleon. But this kind of lease for three lives will not again, save under peculiar circumstances, be granted in the county, for it does not

at all conduce to the improvement of the landlord or the tenant. The term of 20 or 21 years seemed to him (Mr. Lewis) to be about the proper duration for a lease; for it is undoubtedly right that the tenant should have returns out of his improvements of the soil three or four times over, and it is but equally fair that the landlord should in his turn be benefited for a similar period. He (Mr. Lewis) had no doubt that if a tenant, during the term of his first lease, had done justice to the soil, his landlord would willingly grant him a fresh lease according to the then value of the land. As to leases, the gentleman (Mr. Jackson) from whose speech he had already quoted said that there are some parties who think that a mere verbal agreement is much better than any written document:

“There are some ‘old-school’ farmers who will coolly tell you that they prefer a verbal to the most liberal ‘black and white’ agreement. Their father, and grandfather, and great grandfather, they will tell you, had no agreement; and they want none. Of course they do not; they have no capital invested in the improvement of their farm which—come death, or come what will—they fear to lose. Nor are verbal agreements less congenial to the antiquated notions of unimproving landlords. Take the case of the young man full of the desire to make improvements, who asked his landlord for permission to remove some obnoxious hedge-rows, and got the reply, ‘Why, my dear sir, I would not have them touched for all the world: I am nearly eighty years of age, and I want to leave my estate as I found it.’”

We have, however, many of us found, both as regards landlord and tenant, that this verbal-agreement lease is bad, and it is to be hoped that the system will speedily die out, for there is no good in it. He remembered that in the leases granted towards the end of the last century the old notions of feudal tenure still remained; they had not died out. Hence the tenant was required to covenant to give his landlord a certain number of fat hens at Christmas, to supply men to do his landlord’s work on particular occasions, and other services equally absurd. This only shows what were the notions produced in the minds of the men who drew up these leases, and who, as Sir John Sinclair said, was ignorant of the principles of agriculture. Mr. Baker, of Writtle, Essex, observed at that Central meeting:—

“With regard to leases, they were so influenced by custom that they would not suit all districts alike; but no well-intentioned tenant, who was desirous of investing his capital for the improvement of the property and the benefit of his family, would ever consent to take a farm upon a yearly tenancy if he could obtain a lease upon any terms.”

He further said—

“The form of farm agreement best calculated

to give a stimulus to agricultural improvement’ would be that which would give the tenant sufficient interest in the soil to induce him to invest his capital therein—that would give him sufficient time to make a return upon it, so that, at the expiration of his term, he should not feel compelled to withdraw his capital with the knowledge that if he did not withdraw it he would not be paid for it, but that compensation should be secured to him, in proportion to the amount of capital he had invested over and above what was invested under the ordinary modes of farming, and over and above what he might have extracted and returned to his own pocket. He (Mr. Baker) should say that that would be best effected by a running lease extended from 10 to 15, 20, or 25 years, and terminable by either party giving to the other five years’ notice in writing to that effect; but no tenure of land should be commenced without a written agreement. Everything should be reduced to writing, which would prevent a vast deal of trouble in the end; and as the stamps on leases were reduced, there would be no difficulty in effecting it on that account.”

Now he (Mr. Lewis) thought that any agreement so important as this between landlord and tenant ought to be reduced to writing; and as to the terms and form of the lease, these ought to be left to be arranged by the owner and the party purposing to occupy. He thought it was impossible to make any general rules on this aspect of the question. As long as the landlord and the tenant agreed, they would work together very well; and if they did not agree, the sooner they parted the better for both of them. As to the question whether it is at all desirable to grant leases, Mr. Mechi observed at the meeting before referred to, that

“There were two or three considerations which were suggested by common sense in the discussion of this question. And first, he felt that if he had happened to be a tenant farmer, he would have found himself in a very awkward position, had he introduced his improvements in cultivation without a lease up to a certain period. For it was quite possible that in Essex a man might spend £6 an acre in tile-draining its heavy lands, £5 an acre in chalking, and incur a serious outlay in the improvement of roads, the removal of extra fences, and other things which were requisite; and yet, if he were snatched away by death, or circumstances obliged him to resign the occupation, not a shilling of compensation would be obtainable from either landlord or incoming tenant. Such a state of things as that was in no respect consistent with the encouragement of improvement; and he thought if custom recognised a certain amount of compensation to the outgoing tenant for improvements of a permanent character, it must tend to a larger investment of capital on the part of the tenant. He was well aware that there were good landlords and good tenants, and bad landlords and bad tenants; but what they wanted was a ‘custom of the county’ that would so adjust the matter between well-



meaning parties, that each might have a fair and proper interest in the progress of agricultural improvement. The evidence they had, particularly as to Lincolnshire, showed that that might be accomplished. But the combination of a fair and moderate valuation of improvements with a lease was, perhaps, the most desirable arrangement that could be made; and, of course, if custom recognised that practice in a particular district, it had in effect the power of a law. At the same time it would not interfere with the general right of individuals to make their own agreements. Practically, at present there was nothing like harmony of action throughout the kingdom; for while in many parts of the country—in Lincolnshire, Norfolk, and Bedfordshire—liberal and enlightened arrangements were carried out, in others the whole system was so backward that they were really not in a condition to avail themselves of the improvements of the age; and if an attempt were made suddenly to force upon some miserable districts the high notions and progressive sentiments prevailing in others, the results would be anything but satisfactory. He had often heard landlords complain of the difficulty of getting tenants with capital; but his answer to that was simply that it was their own fault, and that to obtain men of capital for tenants they should offer them advantages which would compensate them for whatever investments they might make in improving the cultivation of the soil."

He (Mr. Lewis) ought to have said a few minutes before, while speaking of the three-life leases common in Pembrokeshire, that the necessity for them only had arisen from the circumstance that there was a large quantity of undrained, unenclosed land in that county, unfit for farming purposes, with no farm buildings and conveniences. The landlord himself did not feel disposed either to improve the soil or to erect farm buildings, and to do so he gave them three-life leases. He (Mr. Lewis) could fancy that under such untoward circumstances such kind of leases were very desirable, but under no other circumstances whatever. He would now give them a short extract more. The subject they had met to discuss was a most important one, and his reason for reading those extracts was to show what was the opinion of other men—practical men in different counties on this question. If they confined themselves exclusively to their own county and its practice, they might rely upon it that they would not very much improve. The last extract he should read was from the speech of Mr. Thomas, of Lidlington, made at the Central Farmers' Club. He said—

"That he recognised much truth in the remarks which had just fallen from Mr. Mechi, of Tiptree Hall; but he did not think the club could take upon itself that evening to lay down a code of rules applicable to every variety of circumstances in the letting of estates. The question had hitherto been argued simply as one of pounds, shillings, and

pence—as a question of remuneration for this or that outlay, upon the tenant quitting his farm; and not one word had been said respecting association, where he had invested his capital, where he had formed social and domestic connections, long lived, and had hoped to die. But this he (Mr. Thomas) maintained, that if they wished to have an honest, independent, persevering, wealthy, and intelligent tenantry, they would never obtain them, in the long run, under the system recommended by Mr. Jackson—that was, a yearly tenure determinable at the will of the landlord or a crusty or bilious agent, even though, on leaving, the tenant had an undoubted right to claim a money compensation for the outlay he had made in the soil. There were higher and more generous feelings than those which originated in pounds, shillings, and pence, which ought to dictate the arrangements between landlord and tenant. It was not right that the latter should be in continual dread lest he should be turned out, with a present in money, or what he had invested during the last two or three years of his tenancy; but, before agricultural improvement could be pushed forward at an accelerated pace, mutual good feeling should be established between proprietor and occupier, and that could only be effected by the former giving such a tenure as would attract the best men to the land, and encourage them to lay out their capital, with the prospect of its being returned to them tenfold. In the remark attributed to the Earl of Leicester, who had observed to one of his tenants that, two or three years before his lease expired, he must begin to think of giving a fresh one, he (Mr. Thomas) recognised a correct principle, and the right of the landlord to improve his rent-roll at the termination of a long lease, during which the land had progressively improved, and farm produce generally had been greatly enhanced in value. He had seen many improvements introduced in the cultivation of the soil, and such an extraordinary increase of stock bred upon it—on the Duke of Bedford's and the Earl of Leicester's estates—as would be sufficient, if universally practised, to banish want from our door, even though we were altogether debarred from foreign supplies. Moreover, in the Lothians, in Berwickshire, and other parts, leases had been literally the initiative of good farming; and if they turned to the 'Scottish Husbandry' of Sir John Sinclair, and the 'Journal of the Agricultural Society of Scotland,' reported by Stephenson, they would find cases upon cases where, under a lease of 21 years, the tenants drained with their own tiles, and, upon the expiration of that lease, took the land for a fresh term of the same duration. Such he knew to be the case also on the estate of Lord Leicester, and on the estate of a portion of which he (Mr. Thomas) had the honour to be tenant. He could not, therefore, discard from his mind that, in order to ensure the improved cultivation of the land, they must look to a fixed tenure, and the establishment of a generous confidence between landlord and tenant. Still, he should be sorry if the club arrived at a decision tonight that long leases were best, because he knew it to be a vexed question, and one that should, therefore, be left open for the present."

With that opinion he (Mr. Lewis) fully coincided; and having thus fairly introduced these facts to the notice of the Club, he would leave the members to decide on the question as they thought proper and good.

Mr. ROBERTSON expressed himself much pleased with the interesting account which had been laid before the meeting by Mr. Lewis, and was in hopes to hear the opinions entertained by the tenant farmers present. Mr. Lewis had very properly stated what he wished was the practice in their county, and he hoped that that gentleman would advise the owner of the Bush estate, when he came of age, to adopt the practice of giving beneficial leases to the tenants occupying farms upon that estate. As he had said, he hoped the tenant farmers would get up and state their knowledge of the benefits which would accrue from such an alteration in the present method of letting lands, for no remarks upon the subject would be considered at all personal to any gentleman present. He (the speaker) happened to be a tenant upon the Bush estate, and he believed that if any man had notice to quit, he should be the first man to receive that notice. There was nothing, he was convinced, tended more to the interests of agriculture than leases; those leases extended themselves over a period of 21 years. He sincerely hoped that some of the gentlemen present would step forward and express themselves upon this important subject; and although not possessed of the same eloquence as many he saw around him, yet he sincerely hoped that the practice of granting long leases would shortly be put into execution. Let them have proper leases, the landlords would become benefited by the improvement of their lands, and the tenants would at the same time become prosperous farmers.

Mr. WILLIAMSON would be glad to hear the opinion of the landlords upon the subject as well as the tenants.

Mr. ROBERTSON: Yes, I quite agree with you.

Mr. G. LORT PHILLIPS did not intend to take any part in the discussion, for, as he had stated at the last meeting when the subject was mooted, he did not consider it one fit for discussion at these reunions. He was now more fully convinced than ever by what had fallen from the speakers. If their meetings, which had hitherto been conducted in a friendly spirit, were to be made the arena for bringing forward grievances which might exist between landlords and tenants, all he could say was that their present position would be materially deteriorated. The question was purely a private one between the landlord and his tenants, and therefore he (Mr. Phillips) did not agree in the propriety of its being made a subject for discussion amongst the members of the Pembroke Club.

After referring to the many questions which were involved in the letting of farms, such as delapidations, &c., he regretted that landlords did not attend their quarterly meetings in greater numbers, for the tenant farmers were so numerous that they were something like the bull in the China shop—they had it all their own way. He would just explain two or three reasons why it was very undesirable to grant leases. There were many reasons; but he would not detain the meeting by recapitulating them, but would merely state two or three cases, showing why he objected to Mr. Lewis's views. If the state of the law was always stationary, it might not perhaps so much matter whether they granted leases or not; but they all knew how the law changed in the course of 21 years. Mr. Phillips, in corroboration of his views, referred to a case where by granting a lease to a tenant the game on the land came into the possession of that tenant, so that he could now warn his landlord off his land if he ventured on it in pursuit of game. Such is the state of the law at this very moment. Another reason against granting leases is that it is a one-sided bargain. The tenant may at any time throw up his bargain, and the landlord may have no recompence; but the landlord is tied neck and heels. He might have a very disagreeable and worthless tenant; but he is nevertheless bound to his bargain, and cannot act as the tenant might under similar circumstances. He thought that the matter could be easily agreed upon, and that it may be as well for the tenant, and much better for the landlord, if he does not grant leases, but remunerates the tenant for his outlay.

Mr. WILLIAMSON thought this question was of great importance to farmers. It is, however, at present only in its infancy, and will become a prominent one before long. He was very glad to hear the subject so ably opened by Mr. Lewis, and fully agreed with every single word of it; but Mr. Phillips, it seems, did not agree with him. Now, it is well known that the soil in this county is very badly cultivated; but on lands well cultivated, tenants will not be kept down as serfs. As the land improves, so does the condition of the tenant improve with it, and then they cannot, as he had said, be kept down. They will improve their position and their means. It is a well-known fact that there is not fair play given to tenants in Wales. Those long leases, to which reference had been made, were, he thought, injurious; but he contended that there should be some proper fixed tenure for the tenant; for is it likely that they will bring the property of other parties into cultivation unless they have some security for the outlay of their own money? With respect to the terms and

conditions of a lease, he would not tie down tenants by obsolete covenants; he would give free scope to his capital and skill. The only thing on which he thought it advisable to bind the tenant was that he should not take two white crops out of the soil successively. Then with respect to farm buildings, they knew how badly off they were for these. He desired not to say a word against the landlord, because he contended that the interest of landlord and tenant was mutual. If there be buildings already on a farm, of course the tenant would take them with the farm at the full value; but if the landlord subsequently built houses, let the tenant pay him an additional 5 per cent. for his outlay, and then, at the end of 21 years, let a new lease be granted at the then value of the farm. He could not agree with the yearly tenancy question, because it did not give a man fair-play for his capital, and they may rely upon it that no man in his senses will expend his money to improve another man's land, unless he is protected by some kind of lease.

Mr. DAVIDSON thought that there could be only one opinion as to the tenants' view of this question. They are ready to take leases for 21 years. Now, the only question is—are the landlords willing to grant these leases? if so, no more need be said about it: the whole question is at once amicably settled. He was quite willing to take a lease of his farm—will his landlord grant it? He thought that leases were the best form of tenure both for landlord and tenant; for, as had been said, no man will take a farm and improve that farm to its utmost without a sufficient security for his outlay. The tenant will not lay out his money on his landlord's property without he has a certainty of being benefited by it: it is not right that he should. Let them go to Scotland, and see the kind of farming there, and where they will not find a single farmer without a lease; and where is land more improved, or where does it yield better, than in Scotland? There the system of leases works well both for landlord and tenant. They certainly do lay out more capital on their farms, because they have more money than farmers down here. There, farms of from three to four hundred acres are occupied by tenants with a capital of from £3,000 to £4,000, and they outlay their money upon their farms because they are protected by lease. Now, this he thought was much better both for landlord and tenant than the system in this neighbourhood, and he could only say, in conclusion, that if landlords will give leases, tenants will take them.

Mr. WILLIAMSON said that there was one thing which fell from Mr. Phillips that he should like to notice. Mr. Phillips had said that a lease is a one-sided thing, because the tenants may throw it up when they like, and there is no remedy, for the

tenants are so poor. Now he (Mr. Williamson) thought that it was as bad for tenants to live under a poor landlord, as for landlords to have poor tenants.

Mr. ROGERS (Middle-hill) said that as Mr. Davidson had justly remarked, there is on this question only one opinion among farmers. Now, he thought that by discussing this subject at one or two such meetings as this, there would be only one opinion amongst landlords. He could mention farms on the estate on which he was a tenant, which had been reduced in value by the plan of tenantry quitting them year after year, and now these farms are let to good tenants at a much reduced rent, in order to induce them to bring these farms up to their former value. Now, if these farms had been first let to good tidy tenants under lease, they would have been improved instead of diminished in value. He thought that money was not everything that was wanted in a tenant: they wanted energy and perseverance quite as much as money. He knew a man who took a farm, and all he possessed in the world was 40s. and a horse. He by his energy and industry soon got on and stocked his farm, and at last was compelled to take a larger farm. He soon improved this likewise; and on his son getting married, he gave up that farm to him, and took a larger one still, and he is now going on well and making money; so that it is not money only which the landlord needs in a tenant; he wants energy and perseverance in the tenant even as much as money. He himself did not complain of his landlord; he was very fairly treated; and he did not say that if he had a lease he should farm the land that he did farm any better; but this he would do, he would reclaim more land—would bring at once some 30 or 40 additional acres into cultivation, and so leave his farm at the end of much more in value.

Mr. CLARKE, of Bullwell, thought that Mr. Rogers had spoken to the point, and very well, as he always does. Energy and perseverance will doubtless do a great deal; but it is not every man who can get on with 40s. and a horse. Money is very essential, he thought. They had been somewhat theoretical in their discussion; let them become more practical. He should like to hear from Mr. Williamson how much capital a tenant ought to have before a landlord is justified in letting him a lease. Let them leave these exceptional cases of Mr. Rogers, and come to facts. How much capital is requisite? Is £10 an acre sufficient?

Mr. WILLIAMSON said that it was impossible to enter into such details; these must be left to the parties themselves to decide. There was no doubt but that capital was needed in a tenant; but there is another thing equally wanted, and that is skill.

He would rather let his lands to a man of skill than to a man of money. He thought that £6 an acre would be ample; but it is impossible to fix any general rule for this, as the capital will vary with the nature and quality of the soil.

Mr. COOPER was very much pleased with the manner in which Mr. Lewis had brought the subject forward, and he quite agreed with him in everything he had advanced. He had seen a great deal of agriculture in England, and some little in Wales; but in the whole course of his experience he knew of no county which had improved in agriculture under the system of letting from year to year, but he could mention many which had so improved under leases; he would, however, mention only one instance. At Botley, in Hampshire, there was a large extent of land in a very wretched condition. The lands were apparently valueless; the hedges were down, and the whole thing was entirely neglected. It came into possession of a gentleman, who very wisely let it out upon leases, and now there is not a better-farmed district in England than that. With respect to the question proposed by the gentleman who last spoke, he (Mr. Cooper) would reply that the capital of a tenant would necessarily vary with the differences of soil. The expense of farming one kind of soil is much greater than in farming another kind. They must take into consideration whether the farm is heavy or light land, because to farm heavy land would require a heavier stock of horses, and there are many other things to be taken into account before they can say what capital a tenant ought to have. But he would again say that he never, in the whole of his experience, knew a district well farmed where the system of tenancy was from year to year. Confidence is wanted, both in the landlord and tenant, and leases give that confidence.

Mr. JOHN SIME, of Kilpaison, on rising, said that in his opinion leases were of great advantage to the tenant farmer, and of greater advantage and profit to the landlord. What he had got to say was not merely his own supposition, but a system he had seen working, and giving great satisfaction to landlord and tenant; that system was a lease of 19 years, the tenant being bound to a rotation of cropping. He did not mean to say that there was no better way of letting land; but he did mean to say that under that system the greater part of the landed proprietors in Scotland had improved their estates considerably, and added very much to their income. It might be considered somewhat difficult for the landlords in that county to lay down a system of rotation of cropping, the land in general being so intermixed, and the soil varying to a great extent. To surmount this difficulty the landlord should lay down a system on each farm calculated to soil and circumstances. He thought it possible to draw out a lease equally advantageous to landlord and tenant, giving the tenant a chance to go a-head, and at the same time binding him from injuring or running out the farm. Pembrokeshire had advantages now which it never had before for farming, that was, a market for all farm produce. In his opinion, if leases were granted, they would act as stimulants to farmers to improve the land, knowing they had security for their outlay. A farmer going on from year to year, and perhaps improving the farm, would think his landlord dealt hard to raise his rent; but at the end of a 19 years' lease, the case would be different: there would be a new taking, and it would be only what every tenant might expect—the land to be let according to its value.

The chairman shortly after vacated the chair.

## THE MORE RECENT IMPROVEMENTS IN AGRICULTURE.

In contemplating the progress of agriculture during the last twenty years, we cannot fail to be struck with its magnitude, and at the same time astonished at the irregular rate of its advance—the rapidity with which some improvements are adopted, and the slow rate at which others make their way. If we may judge by the many quarters in which we know trials of the steam-plough to have taken place, that would appear to be one of those improvements which, however far removed from perfection at present, and however foreign to existing practices, appears to be the favourite innovation. This is the very last thing we should have expected. Then, again, guano is another pet. At the beginning of the period we mention, the difficulty was to persuade farmers to use it. It appears now to have

become an agricultural necessity; and it would hardly surprise us—such undue importance appears to be attached to it—if some of our friends were to relinquish farming altogether if the guano supply were exhausted or rendered unattainable. At the same time the manures which exist in the sewage of towns are neglected. Liquid manure, we have been told, is a pretty play-thing, but solid manure is for real farming. Strange as it may sound, this proceeded from one who was the most strenuous advocate of the liquid manure drill, and who did not hesitate to declare that it would pay to cart water two miles in order to dissolve guano and superphosphate, and distribute them by the water drill. To what are we to attribute this apparent inconsistency? Is it that the distribution of liquid manure by under-

ground pipes requires capital, and the liquid manure drill can dispense with it? If that, however, is the only objection, it is one which may be overcome, as we lately endeavoured to point out. Then, again, it is difficult to account for the different estimation in which the steam-plough and the reaping machine are held. We have known the former eagerly patronized by those who do not even use that common implement, the steam thrashing machine. We have heard them eulogize its work as being the best ploughing ever done on their land. This was in a district and on a farm where our ears were gladdened by the sound of the flail. Economical or not, as may be, the flail is doomed. The labourers will not use it—they will no longer submit to be poisoned by constantly inhaling the dust of the barn. While the steam thrashing mill, however, meets with such general favour, how is it that the reaping machine makes so little progress? In our humble opinion it is a far greater boon to the farmer than ever the steam-plough will be. And yet what a time has elapsed since the American reaping machine was first exhibited to the British farmer at the Crystal Palace, in Hyde Park! and how little progress has it made! It involves less expense in the purchase than the steam-plough, and its advantages are less questionable. Like the steam-plough, it requires level lands and large fields, though the latter is not so essential as it is with the steam-plough. Oh! but then the Royal Agricultural Society have decided that it has not yet been brought to perfection! They have come to the same decision with regard to the steam-plough, and yet that does not deter from the use of it on hire, and even the purchase of it. We know districts of level lands and large fields where the reaping machine might be employed with advantage, but where it makes no way. The farmers say, in the districts to which we allude, they can mow their wheat as cheaply as they could reap it by the machine. That, however, is not the question. The great advantage of the reaping machine is the command it gives the farmer over his crop, and the advantage which it enables him to take of a few days of fine weather in our uncertain climate. We have seen farms in districts where they broadshare immediately after harvest, in which it was very evident that enough grain to have seeded the ground had shed, all which might have been saved by the use of the reaping machine. As to its work, the worst work we ever saw performed by any of the reaping machines

left far less rakings than the best mowing. But there are so many reaping machines, it is said, that the farmers are bewildered in their choice. If we may judge by a recent challenge from Canada, there is to be one forthcoming which is to be superior to them all. We can only say that the worst of the existing reaping machines would be a great boon to the farmers. Let them, we would say, buy them all, and give them a fair trial this harvest, and then make their election between them for general use hereafter. Such purchase of all the existing reaping machines would cost less than that of one steam-plough or steam thrashing mill. Such a trial by the farmers of an entire district, through a whole harvest, would be far superior to any verdict pronounced by the judges of any agricultural association. It would not, as we have said, be too expensive an experiment of any of our large farmers, still less for a combination of the farmers of a given district. Let them make trial of all the reaping machines now in existence, and make their election between them. It would be very singular if, among all the difference of opinion which prevails on every agricultural question, the farmers of a whole district should be unanimous in favour of any one; so that the least favourite implement would have some purchasers, and the cost of the experiment, even cheap as it is, would thus be reduced by the sale of the rejected implements. Perhaps, after all, the secret of the slow progress of the reaping machine lies in the dread of its unpopularity with the labourers. That may, as we said on this subject last year, be easily obviated. They may be enlisted on the side of the implement, by agreeing with them for reaping by the acre at the ordinary price, and letting them have the use of the machine at a small price per acre. It is also well worthy the consideration of the reaping machine makers, whether it would not be worth their while to appeal to the labourers by sending machines into districts in which they are not in use, under the direction of a man experienced in their management, letting them on hire to labourers by the acre. We shall conclude, as we concluded on a former occasion, with the statement that in the year of the Crystal Palace Exhibition, we knew a farmer holding 250 acres, who reaped his entire crop with it, and declared that he saved more than the purchase-money in one year. He has the same machine in use still.

### THE MANGEL-WURZEL CROP.

I cannot let the present season for putting in this crop pass without again calling attention to its increasing value and importance.

The immense crops of the past year have been almost invaluable during the late cold and most ungenial weather; and as at this period of the year very much of the watery character of the root is dissipated, it becomes a

truly valuable and highly nutritive food, an admirable substitute for the early grass, and if cautiously supplied to stock on their pastures, is a great aid in promoting their fattening. The danger is in permitting either cattle or sheep to partake unreservedly of "mangold" without a corrective in the form of dry food—i. e., hay, straw, corn, or meal. The writer's

cows have, in this cold season, suffered severely from voraciously eating these roots on grass, although supplied with hay and a warm hovel every night—first looseness, then chilliness, and constipation followed. The cows drove the sheep away, and ate the allowance intended for both.

In all and every county or district possessing a tolerably loamy soil, this crop ought to be extensively cultivated; and on soils of truly inferior quality it would be quite right to attempt its culture. The great thing is to acquire a rather deep, loose, and open soil, perhaps the finer the mould the better: this can often be obtained on the most tenacious clays; but on the very shallow soils, with scarcely an inch above the stone, it should be attempted. Ridging in some degree might provide a seed-bed, and well-rotted dung, with superphosphate, guano, &c., the power to produce the crop. On these inferior soils the Globe variety is best adapted, and the seed should be chosen from the largest-sized stock known. The rule, however, is the long varieties for a plenteous mould, the Globe varieties for a thin or shallow mould; so that, should the cultivator succeed in obtaining a good depth of free open soil, he may safely adopt whatever variety he may prefer.

In preparing the soil for this crop, I need not again repeat that it should be well and deeply worked till a fine free clean tilth is obtained. In the early part of May the crop should be put in. This should be upon ridges twenty-five inches apart, plentifully manured with rich well-rotted dung, and rolled down. The seed is best, most advantageously, and most economically put in by the common dibber irons, thus: The dibber making the requisite holes about twelve to fourteen inches apart along the ridge, is followed by a lad, who deposits at least one good seed in each hole; another lad follows with a mild mixture of superphosphate and couch, twitch, or turf ashes, and deposits upon the seed about a tablespoonful in each hole, and all is either lightly rolled again, or brushed, or otherwise covered in.

The seed, of course, should be steeped twenty-four hours before sowing. I have never known a failure when this system has been carefully pursued; but when the soil and season have been favourable, the most splendid crops have been the result. One great advantage from this plan is owing to the forcing of the young plant by the artificial manure applied (for on some soils superphosphate is not the best aid, and others are adopted with equal benefit), so that it speedily comes to the hoe, which for this crop is of prominent importance; indeed, so important is early hoeing, that it may be desirable to drop in the holes an occasional grain of barley, just to mark the line of holes, so that horse-hoeing may be proceeded with long before the mangel-wurzel plants appear to any extent above the surface. A careful hand-hoeing may succeed as soon as the plants are fully developed, because it is the habit or nature of this plant, particularly of the long varieties, to send their roots deeply downwards; so that no

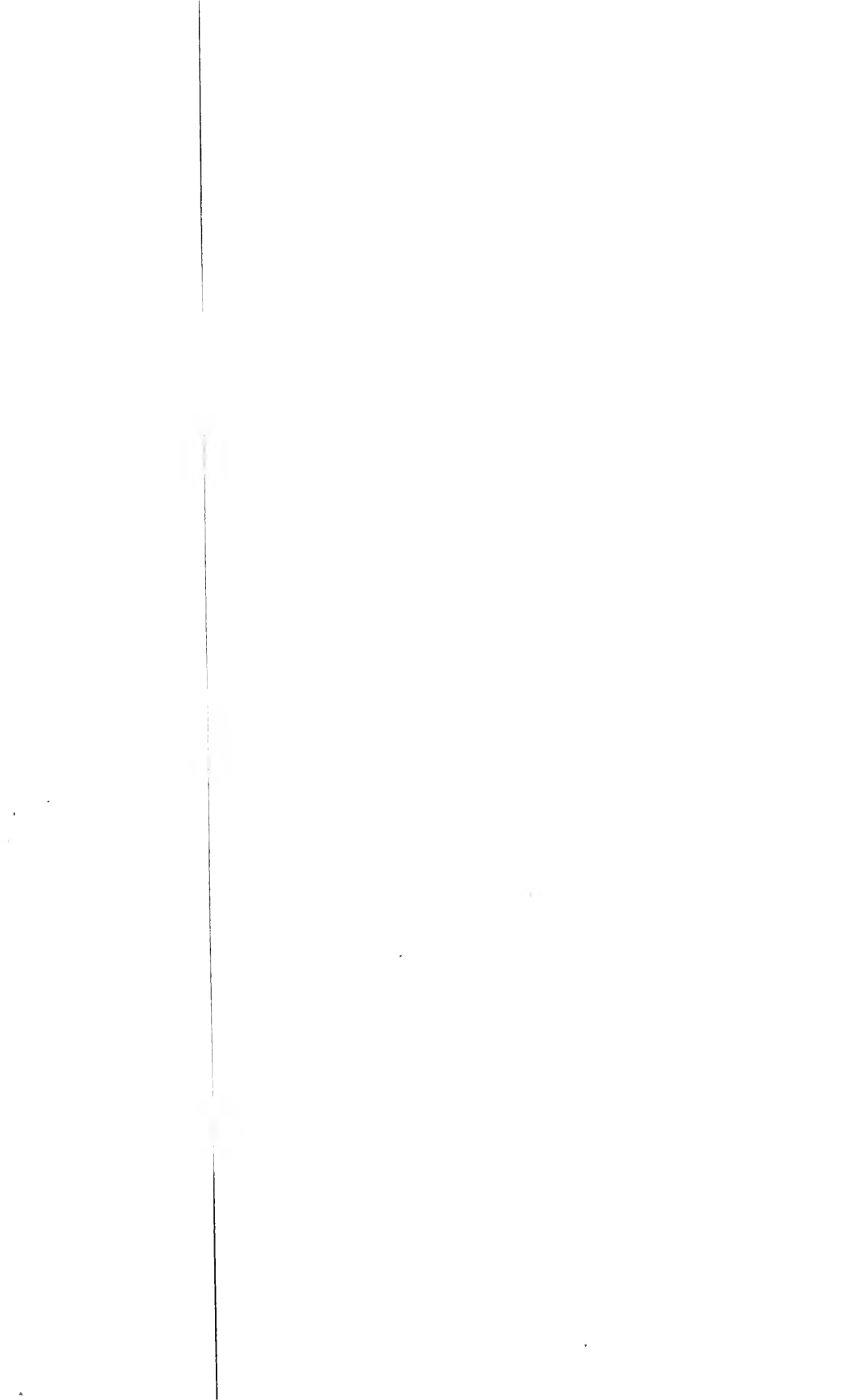
damage will be done by exposing them, but their growth will by the operation be rapidly advanced.

The economy in the artificial manure used is very considerable: something less than 1 cwt. of Lawes' superphosphate, or similar manure, per acre will suffice. It is not desirable to apply a very strong dressing; the judgment of the farmer will soon decide his course in this respect. The liquid manure drill effects a great saving in artificial aids to cropping, but it cannot equal this system if properly carried out, for much depends upon careful mixing in fine particles the manure to be applied: every lump must be broken to powder, and all be nicely sifted through a rather fine sieve. The proportion of ashes should be about from 10 to 12 to 1 of superphosphate.

The economy in seed is of itself worthy of consideration: from 1½ to 2 lbs. of well-grown seed per acre is a good and sufficient seeding, care being taken that the lads do their work properly.

My own practice is to employ two dibbers, each working a pair of irons, and as usual walking backwards, carefully making holes of moderate depth, about 12 to 14 inches apart, along the rows. Eight boys follow each dibber, two on each row to drop in the seed, and two to drop in the manure. A deposit of manure, prepared as above, is provided at convenient distances along the work, and is either put into tubs, or in heaps on the ground; a strong lad is in attendance to supply the droppers. In this way the party will put in from three to five acres per day readily. The ridges are highly manured with good fold-yard dung, so that the young plant has an ample supply of rich food at command, as soon as the superphosphate has forced it into growth strong enough to receive it. The additional vigour thus imparted speedily places it beyond the reach of harm either from a hot sun, drying winds, or drenching rains, your crop is safe if thus managed.

It is a question often put—What provision can be made for stock in the month of April and May, before the grass is fully ready? This season has given a decisive reply: Preserve your mangel wurzel! I repeat, it is an almost invaluable crop, and will be found so the more it is cultivated and its best uses proved. Thousands of tons are now in grave as good in quality—nay, better than when first put in, and if partially uncovered and plenty of air is admitted, will keep so for many weeks to come. Cultivators in this district always make a reserve for pigs; and ram-breeders, and others who are desirous to bring up their stock in great perfection, keep a supply during the summer, which is eaten with great relish and benefit. Growers should make this a point in their calculation as to its consumption, and provide for a quantity not to be touched till after some specified time, say 25th March, otherwise all is consumed during the winter or early spring. A portion of the crop should be purposely grown for late consumption, and set apart accordingly in the autumn. The Globe varieties, are perhaps best adapted for keeping, but the long sorts keep exceedingly well.

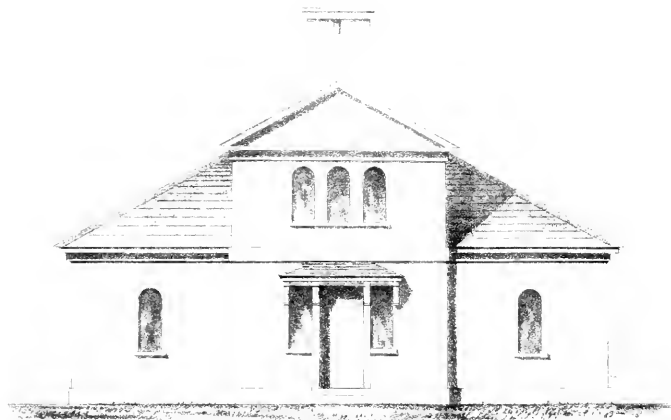


# Plan for a LABOURERS LODGING HOUSE

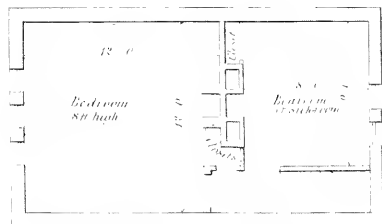
*As given to by W. William Cheffins.*

At a Discussion at the Central Farmers Club,

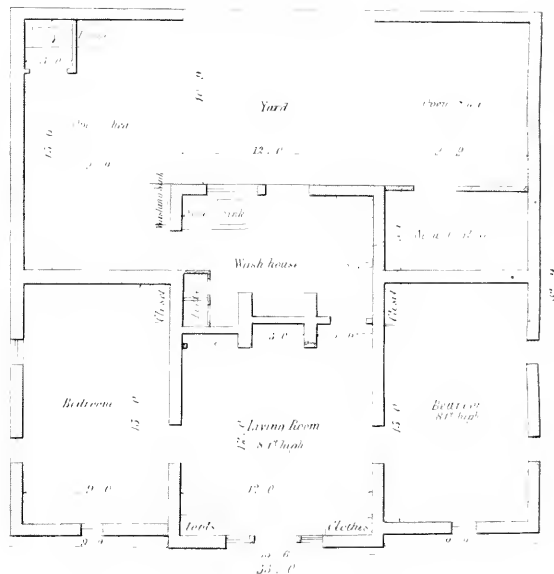
MAY 1857.



ELEVATION OF THE LABOURERS LODGING HOUSE.



— BED ROOM PLAN OF LABOURERS LODGING HOUSE. —



GROUND PLAN

WILLIAM CHEFFINS  
*Architect, St. London*



## THE LONDON, OR CENTRAL FARMERS' CLUB.

THE BOARDING, LODGING, AND MAINTAINING YEARLY AGRICULTURAL SERVANTS:  
THE BEST AND CHEAPEST MODE OF DOING SO.

The monthly meeting of the club was held on Monday, May 4, at the Club House, Blackfriars. Among those present were—Mr. Owen Wallis, of Overstone, Northampton, in the chair; supported by Messrs. J. Marshall, Robert Baker, James Wood, Henry Trethewey, T. Owen, (Rev.) C. T. James, W. Gray, T. W. Granger, W. Cheffins, Spencer Skelton, C. J. Brickwell, J. Cressingham, John Thomas, J. Wood (Croydon), L. A. Coussmaker, H. H. Tatam, F. J. Wilson, Captain Heath, S. Sidney, R. B. Hammond, J. B. Spearing, J. C. Morton, C. Hall, H. Hall, R. P. Browne, E. B. Acton, T. Hatfield, J. G. King, &c., &c. The subject for discussion—introduced by Mr. J. Marshall, of Riseholme, near Lincoln—was: "The boarding, lodging, and maintaining yearly agricultural servants: the best and cheapest mode of doing so."

After a few introductory remarks from the Chairman, MR. MARSHALL read the following paper:—Mr. Chairman and Gentlemen,—When in December last I was appealed to, by our secretary, Mr. Corbet, to propose to the committee of the Central Farmers' Club a subject for discussion at one of our monthly meetings, I scarcely anticipated that I should have been selected to appear before you this evening as the originator of that discussion. I am, gentlemen, a perfect stranger to most of you, and altogether unaccustomed to public demonstrations of any kind, and so far I may be presumed to labour under difficulties which would not apply to many other members of this club. Indeed, I very much regret that it has not fallen to the lot of some one whose peculiar habits and experience would have fitted him far better than myself for the exposition of so important a subject as the boarding, lodging, and maintaining yearly agricultural servants, and the best and cheapest mode of doing so. This would have relieved me of a duty I have somewhat reluctantly undertaken, and which, I fear, it will be found I shall but inadequately perform. I must, therefore, claim your indulgence, and beg of you to bear with me for a short time, and pardon me even should I fail in the attempt to exemplify a system which varies so materially in its customs and bearings in almost every agricultural district in England. Scarcely any two counties, I believe, adopt the same method. I shall now endeavour to explain to you what I consider, and what the experience of past years has proved to me, is the best and cheapest mode of keeping farm servants; and I will here remark, that in carrying out any system which may be hereafter deemed most desirable, it will invariably be found that the best plan is in the end the cheapest, and that the cheapest is not always necessarily the best to be adopted. In taking a number of young men into your farmhouse as yearly servants, I consider

the greatest difficulty we have to contend against, in the present day, is the deplorable state of ignorance in which we commonly find them. This may be traced in most instances to the entire neglect of an early and useful education, and which I regret to say is rather the rule than the exception among the greater portion of those with whom it has hitherto been my province to come in contact. To this cause I must attribute many, if not most, of their misfortunes, and as a necessary consequence, idleness, insolence, and drunkenness, with all their concomitant evils. One great advantage, however, may be said to arise from these yearly hirings, which is this, that it furnishes constant employment, good wages, ample provision, and comfortable lodging: the men have nothing to seek, no legitimate reason for absenting themselves at any time for any purpose; and as they are usually allowed a certain quantity of good sound home-brewed ale day by day, they can have no reasonable excuse for going to a public-house. In all thinly-populated districts especially, I fancy but one opinion can be entertained as to the expediency of the plan I am about to illustrate, by means of which you at once supply yourself with any necessary amount of labour at any time, and to any extent you may desire. So far this is alike advantageous to master and servant. Another great desideratum in hiring these men by the year is that they are always on your premises, early and late, and are responsible for everything that is due to the feeding and care of your farming horses, among which they are expected to spend the whole of their time. In some of the southern, as also in the midland counties, the custom prevails of hiring by the year at a certain sum per week, which is regularly paid every Saturday night, a small deduction, say about 2s., being kept in hand to ensure the service to the end of the contract; the servant in all cases engaging to board and lodge himself at his own expense. This he usually does with the foreman on the farm, who undertakes to supply him with bread, meat, milk, and vegetables, at a fair market price; but which is, I believe, very generally considerably exceeded, and, in the majority of cases, very badly carried out, and great imposition practised. In addition to the cost of provision, 1s. 6d. per week is charged for lodging and cooking; no beer whatever is allowed, except during the time of hay and harvest, when four pints per day are commonly given. The greater portion of the servant's wages is thus absorbed, or spent in some less creditable manner; and the only accumulation he can boast of, at the end of the year, is that of the 2s. per week retained in his master's hands, and which he will require for the purchase of clothes, shoes, &c., leaving little or

nothing as a fund for the savings' bank, to fall back upon when his increased expenses or infirmity of any kind may render it necessary that he should avail himself of what he may have been able to save out of his wages in his early life. In some of the northern counties, and also in North Lincolnshire, with which I am more immediately connected, it is the custom to employ a large number of unmarried servant-men and lads, who are regularly hired by the year at the various statutes held in the district for that purpose, from Old May-day to Old May-day. At the present time wages vary from £5 for lads who can plough and go with horses, to £20 for head waggons, who are also drill men, and stack during harvest. Some few years since (I believe in 1849) Mr. Acland was good enough to favour the public, through the medium of the *Journal of the Royal Agricultural Society*, with Mr. Sotherton's method of boarding and lodging his farm servants: our plan here differs but little from it, and it is now generally adopted throughout the agricultural part of the county; and, taken as a whole, is perhaps in principle as little open to objection as it can well be. On a farm of 500 acres of turnip land it is customary here to work about 14 horses, for which five farm servants, under the superintendence and control of a married foreman, with whom they reside, are considered sufficient. The first and second waggoner are wholly employed from four o'clock in the morning until eight in the evening in feeding, and in the care of seven horses each, whilst the three younger are in the morning, till half-past five (when they go to breakfast), assisting in cleaning and gearing them for their day's work, which they commence at six, and discontinue at three o'clock, when they dine. After dinner, these three lads, with a 10l. 'Richmond and Chandler' chaff machine, improved by 'Simpson,' of Lincoln, cut what chaff the 14 horses require, and which they are generally able to accomplish between four and six o'clock in the afternoon. Our horses here are commonly fed on cut oatsheaves, of which they consume about 36lb. or 40lb. per day, containing probably about 12lb. of oats of an 8-quarter crop per acre, or nearly three stones per horse. As the lads can cut (two turning and one feeding) nearly 30 stones per hour, no difficulty whatever is felt in getting 42 stones in two hours. In addition to this allowance, 1½ stone of bran and 1½ stone of split beans are given weekly to each horse, without any rack meat or other provender whatever. The foreman with whom these men reside is of course a responsible person, and undertakes to provide them with everything that is requisite as far as board and lodging are concerned. He also sees that they do their duty during the week, and that they invariably go to church with him on a Sunday once at least. In the parish of Riseholme, in which I reside, they have also the kindly assistance of the rector one evening during the week, who teaches them to write, explains to them the Scriptures, and lays down a course of duty for their guidance and adoption. This has the very best possible effect: it teaches them self-respect, and softens their naturally rough, uncouth manners, and is in the end conducive in every way to the best and happiest results.

An ample house, and garden for vegetables, are provided rent free; £30 a-year in wages is given to the foreman, who has also the produce of two cows for five, or one cow for three men; 26 stones of bacon (*i.e.*, a fat pig weighing 26 stones) for himself, and 26 stones for each of his men; he has further 40 stones of flour, 20 of best seconds for puddings and pies, and 20 best thirds for bread for each man, one quarter of malt for himself and the harvest men, and one sack for each man-servant (equivalent to one pint per day and four in harvest). He brews himself, and has five tons of coals for the year's consumption; he finds candles for the stables and chaff-house, when required; and has 1s. per day for all casual boarders, such as additional harvest men, blacksmiths, carpenters, &c., who work by the day, and have their board. The men have three meals per day. For breakfast hot bread-and-milk, and cold meat; for dinner, hot meat, pies and puddings, vegetables, and one pint of ale; for supper hot meat, bread and milk, or pea soup. By this means they have always meat three times a day, milk twice, and beer once. They pay for their own washing, and are allowed an interlude of three or four days as a holiday at some fitting period during the year, which always expires on the 13th of May. I believe the quantity of bacon allowed is always consumed, but the flour is a little above what is required. The ordinary consumption of a man, his wife, a servant maid, and five men, usually averages about 30 stones for each person per annum. The annual expenses of their board and wages may be set down as follows:

Foreman's wages	.. .. .	£30	0	0
26 stones of bacon, at 7s.	.. .. .	9	2	0
1 quarter of malt	.. .. .	3	12	0
2 cows, at 3s. 6d. each per week	.. .. .	18	4	0
130 stones of bacon, for five men, at 7s.	.. .. .	45	10	0
200 stones of flour at 2s.	.. .. .	20	0	0
5 sacks of malt at 9s.	.. .. .	9	0	0
5 tons of coals at 12s.	.. .. .	3	0	0
2 waggoners' wages at £12	.. .. .	24	0	0
2 middle men at £10	.. .. .	20	0	0
1 boy at £6	.. .. .	6	0	0
		£188	8	0

In addition to the above, the foreman's wife shares largely in the profits of this system, inasmuch as she has the butter and superfluous milk from two cows to dispose of, valued at £20 to £25 per annum; the privilege of raising poultry of every description, and gathering eggs. For these she receives a certain price per couple and per score, out of which she pays her maid servant, and retains the residue as her own perquisite in return for her vigilance and labour. Upon her good management very much depend the comfort and well-being of the whole establishment. These items amount to £188 8s. for six men, namely, one foreman and five farm servants, the yearly average for each being £31 8s., or within a very trifling sum of 12s. per week. Now, if it be taken into consideration that the ordinary wages of a daily labourer (whose day begins at six o'clock in the morning, and finishes at six o'clock in the evening) are 15s. per week, exclusive of a very considerable increase during harvest, I think

it must in justice be conceded to me that I have at least pointed out to you not only a far cheaper, but in every other respect a far better plan; such a one as, moreover, may at any time be made available in any county, or in any locality, and one that is equally advantageous to master and servant. It has, too, the acknowledged authority of one of the largest and best cultivated districts in England to confirm its practical utility, and to warrant its more general adoption.

Mr. CHEFFINS (of Moorgate Street) said: I seldom take part in the discussions, because I feel that an effective participation in them requires a practical knowledge of the subjects brought before us; and as these generally refer either to the theory or practice of agriculture, I prefer to listen to those whose greater experience entitles them to our attention. On this occasion, however, I am better qualified to express an opinion on the subject on the card for this evening's consideration. I shall not look at it from that point of view which Mr. Marshall has so well explained; but, feeling a deep interest in the well-being of the labourer, a feeling nourished and strengthened by many years' experience of his wants and habits, I propose to submit to the notice of the Club a few remarks on that special phase of the labourer's life, the Lodging-house, which has of late attracted public attention, partly from its comparative novelty, and partly from a conviction that much good may be done by these means. Apart from the model lodging-houses in London, Glasgow, and other large towns, which, however well adapted for handicraftsmen and mechanics, do not find much favour with our country labourers, I find that Mr. Beckett Denison, in January, 1852, published in the *Mark Lane Express* the detailed workings of a lodging-house for single men in Leeds, which certainly exhibited very favourable results, though I suspect that the agricultural element formed but a small part of the success there shown. Mr. Spearing, in his lecture in November last, spoke of an establishment near Bristol, I think, which seemed to approach nearer to what was required; and last year I observed that a lodging-house was opened at Parndon, in Essex, which was built under Mr. Clark, the diocesan architect. Since then the Rev. John Bramston, of Witham, has opened a labourer's home at that place, which is fully described in the *Chelmsford Chronicle*, of January 23, in the present year. The *Mark Lane Express* of the same week has also a telling article on this subject. I have written to Mr. Bramston for the results of his undertaking, and before I sit down I will read you his kind and polite reply. In contributing, then, towards this desirable work, I shall not so much urge the establishing lodging-houses upon philanthropic grounds, but will approach it from a lower height, viz., that of self-interest; and divesting it still further of the advantages which must and will arise from the improved habits, and consequently increased value of the labourer, I propose to show that even as a speculation and investment, it is a safe one; and I hope to prove to the satisfaction of the Club that any proprietor or occupier of land, who has

six or eight single labourers in his employ, can greatly improve their domestic comfort, and materially advance their moral elevation, not only at a certain moderate cost, but with a safe and sufficient return for the capital invested in such a praiseworthy undertaking. I have, therefore, prepared a sketch of a building, which can be put up on any convenient spot, either on or near the farm or in the village. A small barn or a good-sized cottage, if available, might be altered to answer the purpose, but I prefer now to describe a building which is specially designed for a "labourer's lodging-house." This plan takes up the common type of a cottage, either in a town or village, as containing two upper and two lower-rooms, to which is added a ground-floor wing on either side, to contain three single beds. The dimensions correspond pretty closely with those usually found in cottages, but the arrangements are slightly varied, to meet the peculiar requirements of the case. The plan provides for the accommodation for six or eight single men as lodgers, under the care of a steady labourer and his wife, to whom they will pay a weekly sum for washing, mending, cooking, &c., in addition to the weekly rent of 1s. or 1s. 6d., as shall be fixed by the proprietor. On entering the house, there is a closet on one side for such lighter tools and implements as a labourer will naturally keep in his own charge, and on the other side a similar closet for outer coats and garments, leggings, boots, &c. The room is lighted by a window on each side the front door, and is warmed by a cottage range with oven and boiler; a large closet fills up one side of the fire-place, and fixed and moveable seats, a plain strong table, a clock, and a few bookshelves complete the furnishing of the room. On either side is a door opening into a bed-room with boarded floor, well-lighted and ventilated, containing three single iron bedsteads, with plain but sufficient bedding, and a closet for clothes, apportioned to each lodger. The washhouse has a fire-place for wood, a sink and dresser, and a set of lockers for food, &c., one for each lodger. The wood and coal-house might be entered under the stairs, and part of it could be used by the master as a storeroom for table-beer, potatoes, and other articles, which he might supply to the lodgers. The front bed-room is exclusively for the master and mistress, and is sufficiently large to allow a small room to be enclosed from it for children if necessary. The back room contains two beds, and can be kept as the "sick-room," and when not so required can accommodate two additional lodgers or two mechanics or artificers, who would gladly prefer a lodging like that to the more expensive one at the public-house or beer-shop. In the yard are two open sheds, with washing sink, privy, &c.; these sheds may be used for recreation, bowls, smoking, or any occupation which the lodgers may choose for their leisure. A garden, not exceeding 20 perches in extent, should, if possible, be attached to the lodging-house; it would probably be cultivated by the lodgers, who would share in its produce in return for their labour. I shall not touch upon the rules and regulations, or system of management of a lodging-house, because these must vary according to circumstances; and the experience of

those who have had the control of the few which are already established will, I am sure, be cheerfully imparted to others, who may wish to advance with them in this desirable work. Having briefly enumerated the accommodations of our lodging-house, I will now speak of the most important part of my subject—the cost of erecting and furnishing the same, according to the plan and foregoing description. I have gone carefully into the details, and find that, from an average of prices in different districts—

The building will cost about, including sinks, cisterns, stoves, &c.....	£170 0 0
To furnish the house with eight iron bedsteads and bedding, tables, chairs, forms and seats, shelves, clock, the necessary crockery and cooking utensils—everything, in short, except for the master's bed-room, will cost about .....	40 0 0

Making a total of..... £210 0 0

The annual expenses of the establishment may be estimated as—

Rent for the 20 perches of ground for the site of the house and garden .....	£ 0 10 0
Interest at 8 per cent. on £170 .....	13 12 0
Ditto at 10 per cent. on £40 .....	0 8 0
	£14 10 0

The annual income to be derived from eight lodgers and the master, at 1s. per week each, is..... £23 8 0

This is assuming an extreme case, that every bed would be occupied for every week during the year; but we shall allow, I think, an ample margin if we anticipate that five beds out of the eight, besides the master's, will, after the first year, produce the weekly shilling, and this will make a rental of £15, and so provide for the annual expenses. In some cases 1s. 6d. per week may be readily charged; and if the home be a private one, as it were, and confined to the labourers on a farm or estate, no difficulty need be found in making it, not only self-supporting, but also, as it ought to be, sufficiently remunerative for the capital invested in it. I will now read the letter of Mr. Bramston, to which I have already alluded:—

“Dear Sir,—I am sorry that I cannot yet give you any results: the house was only opened in February, and I have at present only three lodgers; but I did not expect to fill up my rooms except by slow degrees. I have room for eleven beds, and were I to obtain eight or nine lodgers, the lodging-house would be self-supporting. Those who have lodged at the house express themselves perfectly satisfied, and in truth they could not get the same comfort elsewhere for the same money; but lodgings at the *public-houses* have attractions still which I cannot offer, and the poor people, though they have not *decent* accommodation even for the members of their own family, do not like to give up a lodger who helps them to make up their rent.

“I think that in most cases a person who sets up a lodging-house must be prepared for the first year or two to be out of pocket; but after that, I am of opinion that the thing would pay itself.

“I am sorry that I cannot give you more information. I enclose our very simple rules; and I can only hope that your discussion may lead to the more general experiment of lodging-houses for young men, which everybody must acknowledge are really wanted, if the character of our working population, male and female, is to be improved.

“I am sorry I shall not be able to be in London to listen to your discussion, and am much obliged to you for your invitation to be present.

“I am, dear sir, yours faithfully,

“*William, April 25.*” JOHN BRAMSTON.

Mr. Cheffins also read the rules of the Chipping Hill Lodging-house, established to provide comfortable lodgings for respectable single day labourers; namely, a separate bed for each lodger, and a common room for all. The main provisions were that no lodger could be admitted for a less period than one month; that the house should be locked up at, and that no admission should be obtained after, a quarter to ten o'clock at night; that the charge to each lodger for bed, fire, and light, should be a shilling a week, or 3s. 9d. a month, paid in advance; that drunkenness and disorderly conduct should be followed by immediate expulsion, and that no person be admitted as a lodger without the permission of the Rev. Mr. Bramston, or continue as a lodger if that permission were withdrawn. Mr. Cheffins then continued: Although I have alluded to the moral advancement and mental improvement of the labourer as the certain result of a well-ordered lodging-house, I do not propose to enter into the means by which they are to be effected, nor shall I mention the many inducements which may lead the young labourer to prefer the lodging-house, as I have described it, to the deep-rooted allurements of the public-house and beer-shop. These higher motives I leave to abler advocates; but I am at the same time fully convinced that, where the attempt is made in earnest, ample and judicious assistance will readily be found, and I cannot for a moment doubt, if you can offer to the single labourer or mechanic a clean and separate bed, a warm fireside, with such sources of amusement and improvement as his tastes may incline to, at a cost not exceeding, but below, what he must pay for inferior comfort elsewhere, that he will hesitate to choose that home which will best secure both his present and future welfare. Gentlemen, I fear I have wearied you with so much detail, and I will only detain you by this concluding remark, that I will most cordially give my aid in assisting, by plans or otherwise, any member of this club, who may wish to establish a labourer's lodging-house.

Mr. TATAM (of Moulton, Spalding,) could not understand how cows were to be provided for at 3s. 6d. a week.

Mr. MARSHALL.—They would not cost 3s. 6d. a week in summer on grass: that Mr. Tatam must concede.

Mr. TATAM.—How much less in such a season as during the last two or three weeks? In your district you would have very little grass, and they would not be provided with it in a way to satisfy your foreman.

Mr. MARSHALL.—It would be a half-crown in summer, and 4s. 6d. in winter, giving an average of 3s. 6d.

Mr. TATAM.—How much cake do you give?

Mr. MARSHALL.—Three pounds a day, with barley, oats, straw, and turnips; unless you can keep them cheaper than that.

Mr. TATAM.—No, I can't keep them so cheap.

Mr. R. BAKER (of Writtle), having briefly alluded to the able manner in which Mr. Marshall had treated the subject, said he was sure that if a system which had proved so beneficial in that gentleman's district could be introduced into others, vast advantage must accrue to the

labouring classes. But, unfortunately, old habits and customs were not easily eradicated, and to endeavour to introduce it into Essex, for instance, would be a most difficult matter, even if the attempt were made by gentlemen as independent and persevering as his neighbour, Mr. Bramston. Some years ago Mr. Fortescue, a gentleman well-known in Essex, made the attempt on a farm at Southminster, where labour was very scarce. He went to great expense in erecting a lodging-house, much upon the principles described by Mr. Cheffins; but, though there was a lack of lodging-house accommodation in the district, and every inducement was held out to the labourers, the experiment was altogether unsuccessful, and at this moment, upon the farm of North Wick, in Southminster, in the occupation of Mr. John Kemp, the lodging-houses were totally useless, and he anticipated a similar result with those of Mr. Bramston. In his (Mr. Baker's) district there was an abundance of labour at all times except during the harvest months. In the district of the Chairman, on the other hand (Northamptonshire), there was a deficiency of labour; and it became necessary to hold out inducements to obtain labourers to carry on the cultivation. Wherever that was the case, the labourers would be sure to be benefited to a considerable extent by receiving better wages. But having heard the statement of Mr. Marshall, it would appear that in Essex the farmers were paying a larger sum to their labourers than was paid in Lincolnshire, where the advantages enjoyed by the labourers were so much greater; £31 8s. a-year seemed to cover the whole expense of a labouring man in Lincolnshire, whereas he (Mr. Baker) could not make out that his labourers cost him less than from £35 to £37 on an average. He made his calculations thus:—

	£	s.	d.
48 weeks at 11s. ....	26	8	0
4 weeks in the harvest and hay season ..	6	0	0
Beer for 48 weeks .....	1	16	0
Beer in the harvest and hay season ....	1	0	0
Total .....	£35	4	0

Horsekeepers, in Essex, were generally paid from 1s. to 2s. a week more than the ordinary men, either in money or rent, besides having other advantages which he had not enumerated. He (Mr. Baker) paid them 12s. a week for 48 weeks; they also got £6 for the harvest and hay season; and this, with £2 16s. for beer, brought their wages to £37 10s. But, though he was paying more to his labourers than was paid to labourers in Mr. Marshall's district, he presumed the latter were better off, managed in the way they were, at £31 8s. than in Essex at £37 10s. The difficulty would be to introduce the system into Essex. Mr. Bramston had laid it down as one of his rules that all the men should be in the lodging-house by a quarter to ten o'clock. Such a regulation, he believed, it would be impossible to carry out; indeed, he remembered his own father giving up the system of boarding his servants on that very account. Old Marshall, who wrote in the year 1775, and was a farmer in Surrey, kept his farming minutes for every day in the year; and on various occasions he found him breaking out on the drunken-

ness, ignorance, and carelessness of his labourers, and the great difficulty he had in managing them, especially at night. He mentioned one particular occasion of their coming home half-intoxicated, turning the working oxen into a field of clover, and upon rising in the morning, and finding that two or three of the oxen had died from the quantity of clover they had eaten. Most bitterly, and with good reason, did he ejaculate, "O, Ignorance, thou pander to ill luck!" What happened then was happening now. He (Mr. Baker) did not think we had advanced one jot in improved management of our labourers from that time to the present. In many districts where labour was abundant, advantage had been taken of it to reduce wages to the lowest minimum point; and there the labourers were not nearly so well off as at the period when Marshall wrote. For his own part, he could not take upon himself to suggest anything, upon a general principle, that was calculated to improve the position of the labourer, except that he should have constant and regular employment upon the farm; that he should not be turned adrift when his services were not absolutely required, and be put on again when they could not do without him; that every labourer should receive proper encouragement in his work; and that the practice of paying a uniform rate of wages to all alike should be done away with, for some labourers were worth half as much again as others, and the payment of all alike tended rather to encourage idleness and the bad execution of work (Hear, hear).

A MEMBER: How can you avoid it under the present system?

MR. BAKER: You can avoid it if you choose. Every labourer should have the opportunity afforded him of occupying a sufficient quantity of garden ground near his dwelling, into which he might put his surplus labour, as a sort of savings bank, to fall back upon at the end of the year (Hear, hear). That was a point of essential importance (Hear, hear). But he would take care that there should be due regulations for the management of the ground, that it should be cultivated on the gardening system, not for the growth of corn, so that the man's labour should be turned to the best account. Good home-brewed beer too, however weak it might be, was in his opinion exceedingly beneficial to the labourer, and should be supplied to him on the farm where he worked. He allowed his men from four pints of table-beer a day, every day in the year that they worked for him, and this could be done for the low sum of 9d. a week! (a laugh.) In harvest time he gave them six pints of good ale per day, with as much table-beer as they liked to drink. That perhaps was somewhat in excess, but it was an old custom, and one that was difficult to break through. He could only further say that the more encouragement the farmers gave to a well-conducted class of labourers the better it would be for themselves; for upon every farm he could tell what the management was by a glance, first at the labourers and next at the horses (Hear, hear).

MR. BROWN (of Great Hallingbury, Bishop's Stortford) considered it of the utmost importance that

farmers should devote more attention than they had done to the welfare of their labourers. In the county of Essex the labouring population exhibited an amount of poverty and crime, which contrasted very unfavourably with the state of things in Lincolnshire as described by Mr. Marshall, where the men were much better cared for. In the latter county, labouring men, besides being paid 15s. or 16s. a week, worked for a long period under the same masters, and there was the best understanding between employers and employed. One effect of this sympathy was to excite a desire for improvement and emulation in the minds of the best class of men; and he was informed that in many of the cottages the occupant was found to be desirous of taking a larger holding of garden ground. He hoped to see a better state of things extended to other counties.

The Rev. C. T. JAMES (of Devonshire) observed, that the system which had been brought under their notice that evening was one which did not generally prevail in English counties. The boarding, lodging, and maintaining of agricultural labourers was necessarily confined to those parts of England in which employment was abundant and labour comparatively scarce; and in those districts it was exceedingly important that every effort should be made to cement good feeling between labourers and their employers, lest the former should be induced to emigrate. In looking over a Lincolnshire paper last week, he was struck with the remark, that at the hiring fairs which prevailed in that county the attendance of labourers was now much smaller than it used to be; and in the same paper he found a statement that a large number of labourers were emigrating from Lincolnshire to our colonial possessions. He would have been glad if Mr. Marshall had explained why there should be so much emigration when there was such a good feeling between master and men. There was one part of the system described by Mr. Marshall which appeared to him objectionable; he referred to the statement that 4s. was paid to the foreman for the maintenance of each of the young men. He was not surprised that it did not work well. That arrangement appeared to him to partake of the character of the truck system—a system which, wherever it prevailed in any degree, was injurious to the position of the labourer, and unsatisfactory to all who were interested in his welfare (Hear, hear). With regard to the excellent remarks of Mr. Cheffins, he must observe that in his opinion there should never be a labourer's house erected without three sleeping apartments being provided. In the existing lodging-houses there was a great deficiency in the provision for cases of illness, inasmuch as a separate room was not appropriated as a sort of hospital, where sick persons might have quiet and comfort, in addition to medical attendance. He was much struck the other day by observing a lodging-house at Clevedon in Somersetshire, erected expressly by Sir Arthur Elton, where there was not a single inmate belonging to the class for which the building was designed. It appeared to him that the landlords of England had great responsibility resting upon them with regard to the improvement of the dwellings of agricultural labourers. Where

lodging-houses existed, the first rule which should be laid down by every landowner with regard to the cottages on his estate was, that no lodger should be admitted into any of them (Hear, hear). It was well known that great demoralization arose among the labouring population from the taking of lodgers. The clergy might preach morality and religion, and the laity might do all in their power to effect improvement; but so long as the families of the labouring population were allowed to mingle indiscriminately, without proper distinction being made between the sexes, all such efforts would be in vain (Hear, hear). Every landlord in England, or steward of the landlord, should make it an imperative rule that no lodger should, under any circumstances, be permitted in the labourers' dwelling. That was, in his opinion, the keystone of the lodging-house system, as well as an indispensable requisite as regarded the morality of the labourer. In the case of the lodging-house at Clevedon to which he had referred, he ascertained that it was erected for eleven inmates, and that only three labouring men had occupied it. The attractions of the village were, it appeared, so strong that, although labouring men might have a comfortable bed, and a comfortable fire when they required it, for 1s. 2d. a week, there was not a single labourer in the house. On inquiry, he learned that masons, painters, and other artisans from Bristol had used the house; and perhaps that fact partly accounted for the absence of farm-labourers. In lodging-houses of that description it was very desirable that there should be something like a reciprocity of sentiment between the inmates, and that, when labourers returned home in the evening, they should have as their associates those who were interested in the same topics as themselves (Hear, hear). On Friday last he was at Coleshill, Lord Radnor's place, in Wiltshire; and he was very much struck with the plan adopted there with regard to the lodging and maintenance of labourers. The shepherds and carters all slept over the animals who were entrusted to their care; prizes were given to the men on the farm; all the boys were provided with a dinner; and fines were enforced for any impropriety of conduct. That had been the system pursued for years; and one valuable feature was, that the connecting link between the boy and the man had not been lost sight of. One great benefit offered by good lodging-houses was, that they had a tendency to prevent improvident marriages, which were the greatest curse to the labouring population. If boys and young men had a place to live in, where they would be comfortable, and where there would be some one to take an interest in their habits and welfare, that would to a great extent act as a check on this evil.

Mr. MARSHALL, adverting to what had fallen from Mr. James with regard to the Lincolnshire hiring fairs, observed that the end of the servitude was always on the 13th of May, and the principal statutes did not occur till after that period: hence it was that very few masters or servants attended statutes before that period. He did not think there was much emigration going on: at all events, he had not heard of much in his own district. They had no such system of lodg-

ing houses in Lincolnshire as had been mentioned in the discussion. The lodging-houses there were the houses of the foremen, who undertook to board and lodge the men for the benefit of the masters.

Mr. TATAM thought that Mr. Marshall was rather in error with regard to the hiring of farm servants in his county. The men were, he believed, entitled to attend two statutes before the expiration of their year of service. His own testimony, with regard to emigration, must differ from that of Mr. Marshall. He lived in a different part of the county from that gentleman—a part near the coast; and there one effect of the receipt of high wages was that labourers saved considerable sums of money, and sometimes emigrated to a fearful extent. Being connected with the administration of the poor law, he had had considerable experience in this matter, and he knew that it was a very common thing after harvest for men who had got together eight or ten pounds to emigrate to America, leaving their wives and children to the risk of their being able to send money to them that they might follow. Generally no aid could be given to such parties in emigrating, because they did not go to any of our colonial possessions, but to the United States. The saving of money by labourers in Lincolnshire was not at all surprising. It was very common in that county for farmers to give from 16s. to £1 an acre for the cutting of their harvest. They gave the carters 15s. a week.

A MEMBER: Of what part of Lincolnshire are you speaking?

Mr. TATAM: The neighbourhood of Spalding.

Mr. ACTON (of the Temple), in the absence of more practical men, was desirous of drawing attention to the improvement of the labouring classes, in whatever way it might be considered right—by voluntary or involuntary labour. The old feudal system seemed to have fostered statute hiring; and he was much pained, many years ago, in observing the truly ludicrous position in which labourers were placed, on a statute hiring day, in the old town of Huntingdon. Labour, whether voluntary or involuntary, had been allowed, by legislative enactment, to work out its own redemption; and since the Reformation and the growth of the middle classes, to the present time, and the celebrated series of acts of Parliament called "Buller's Acts," a free trade in labour had been sanctioned, and the labourer had been allowed to bring his labour to the best market. It was a lamentable fact, but no less notorious, that the lower classes are not sufficiently educated, whilst the vast majority of agricultural labourers are scarcely educated at all. True it is, we have parish schools and Sunday schools, which have done an immensity of good, and reflect great credit on the numerous clergymen who have given them their assiduous attention; and training schools in this great metropolis, and ragged schools, which are conferring a vast amount of good. Still, the small extent to which the schools in the agricultural districts avail themselves of the assistance of the Lords of the Committee of the Council of Education is regretted by Mr. Moseley, in

his recent report of the schools in the southern and south-western districts. "The village school," he says, "should be made an agricultural school for industrial instruction;" and we all must admit that the capabilities and component parts of soils, the nature of their bases and acids, and how operated upon by the atmospheric changes, the ingredients of plants, and the uses of the several manures, implements of husbandry, and machinery, would be of immense importance to those who have emigrated, or who are about to leave this country for the United States, and our colonies; for, owing to the gold discoveries in South Wales and Victoria, in 1851 and 1852, emigration has gone on to a great extent—so much so, that we have lost some of our best labourers; and soldiers were engaged this last autumn to gather in the crops of the farmers in some parts of the north of England. Where do these come from? Mostly from the labouring classes, who are tired of the monotony of keeping off birds and swinging all day on gates, stupid from ignorance and starvation. He would say—build schools instead of gaols. Draw out the labourer's capabilities, and make him a better Christian, a more obedient soldier, a more prudent and more energetic emigrant, a better workman, and a more reflective, effective, and moral man; and, at the same time, you make him a better and more useful member of the community.

Mr. SIDNEY (of Peckham) thought it undesirable to adhere very closely to the question stated on the card. The boarding, lodging, and maintaining of agricultural servants was no doubt a very important matter; but labourers were not horses or cows, and must not be treated solely in the light of animals. In a pecuniary point of view, however, farmers wanted them to be sober, healthy, and industrious; and in order that they might be so, they must endeavour to place them in such circumstances as would tend most to the cultivation of such qualities. He knew something of Lincolnshire; but he must say that when it went forth to the public that labourers in that county could earn 16s. a week, and get meat three times a day, the statement would create a good deal of surprise (Hear, hear). No doubt if those who were present could have their own way, the system which worked so well in Lincolnshire would be extended to many other parts of England; but it was impossible to transplant the system of one county to another, unless they could at the same time transplant the conditions under which that system existed (Hear, hear). As regarded the management and regulation of lodging-houses, they must not forget that they had to deal with men who would not be contented with being merely paid and fed (Hear, hear). The labourer wanted amusement, and to find it he flew to the public-house. It was easy for those who were surrounded by all the comforts of home to be severe on those whom they employed; but they would not themselves like to be confined to a lodging-house, where they always saw the same faces, and there was nothing to amuse or interest them (Hear, hear). If they wanted to effect any great improvement in the condition and habits of the labouring class, they must begin a good deal earlier than the period which they had been contemplating. In the great majority of the agri-

cultural districts the cottage accommodation was very defective, and it was under such circumstances that that character was formed with which employers had to deal in after-life (Hear, hear). As long as the present law of settlement existed, it would be almost impossible to carry out the requisite improvements. The first great step in improvement was the abolition of that law which prevented the building of decent cottages, and would in many instances cause model lodging-houses to be a failure. The next step was education. By education he did not mean merely reading and writing, but he included in the term that kind of instruction which would tend to make agricultural labourers more useful to their employers, at the same time that it would improve their own social condition; he meant education which would fit the children of labourers for the pursuits which they had to follow. He saw no reason why books should not be circulated by the Committee of Council on Education which would give children some idea of the nature of the stock which was likely to be under their charge, of the construction and use of agricultural implements, of the nature and injuriousness of various weeds, and of the character and peculiarities of different crops. There would be great advantages in imparting such instruction. In the first place the children would when they left school be much more useful servants to their employers; in the next place their parents would feel a great deal more interest in their studies when they perceived that they were of a practical character. (Hear, hear). As regarded lodging-houses, he should deprecate any attempt to regulate them too much. It was something to get a labouring-man to live in a decent place, and there would be no utility in examining too closely how he employed his leisure hours. The great point was to surround the labouring population with influences which would tend to raise them in the moral and social scale.

Mr. GRANGER (of Stretham, Ely) considered Mr. Marshall's paper one of the most important papers that had ever been read to the club. If such a system as he described was to be generally carried out, the landlords of the country must first provide proper dwellings for the labouring classes, so that they might be fitted for such a state of things. It would be of no use to put ignorant or morally-debased young men in such a position; in that case the thing would fail; but let labourers be brought up in houses where there was a proper separation of the sexes, and let them be properly trained and educated, and then they would be progressively fitted to occupy a better position hereafter. There was a broad distinction between the houses which Mr. Marshall described and those which Mr. Cheffins described. Mr. Cheffins spoke of lodging-houses for mere labourers in populous districts; whereas what Mr. Marshall described was a house on a lone farm, containing only the people who worked upon that farm, and who never left it from year's end to year's end. As regarded thinly-populated districts, he was convinced that the better the system described by Mr. Marshall was known the more it would be extended. Such was the present condition of many of the labourers

in Essex, that he might almost say their services would be dear at nothing. He could assure them there were labourers in that county, who scarcely had meat once a-week (Mr. Baker: Some parts of it); and, when such was the case, what amount of work were they likely to do? (Hear, hear). He hoped that this subject would be well pondered by agriculturists, and that nothing would be neglected that was likely to promote improvement.

Mr. WOOD (of Ockley, Sussex), whilst dissatisfied with the mode in which the labourers were managed in Sussex, was of opinion that that was a district in which if the system of Mr. Marshall could be carried out it would be very beneficial. The wages there were good; but the beer-shop proved too great an attraction, and there was altogether such a spirit of insubordination, and such a disinclination on the part of the labourers to do their work creditably to themselves and to the advantage of their masters, that an improved system was imperatively required. To this end, he thought with Mr. Sidney that the children of the agricultural labourer should be better educated; for it had been well and truly said, that "the child was father to the man."

Mr. H. TRETHERWY, (of Silsoe, Beds) said much had been said about the necessity of increased education and of better treatment for the labourer; but there was one point which appeared to have altogether escaped notice, namely, how much the comfort of the labourer and the character of his children depended on the labourer's wife. (Hear, hear.) In many places he had observed women labouring in the field; and he could not imagine how a woman who worked in the field, and who, perhaps, had at the same time four or five children to look after at home, could attend to her home duties in such a manner that when her husband returned there at night he would find his place in a comfortable condition. (Hear, hear.) He had generally found that where this evil of the employment of women prevailed, it was coincident with low wages. (Hear, hear.) It was often a frightful source of mischief, and had the effect of driving the labourer to the alehouse, or some other resort at a distance, in search of relief or amusement. In other agricultural districts, women and young girls were employed in various branches of manufacture—lacemaking, strawplaiting, shoemaking, &c.; and however necessary such operations might be to society, their existence in agricultural districts was always to be deplored. As regarded the employment of labourers, he thought it very unjust to treat a labourer just as you would treat a tool. One often found labourers taken on for two or three days, and then discharged; and the effect of that was that they lost all interest in their employer. There should be an identity of interest between the employer and the employed, but under such a state of things nothing of that kind could exist.

Mr. SKELTON (of Sutton Bridge, Wisbeach) said he lived in a district where there were excellent free-schools for boys and girls; but though there were good schools and good teachers, there was a want of children. This arose from two causes: the farmers are anxious to get boys and girls in their fields, and the parents of the children



required the money which they earned to assist in their support. These were formidable difficulties in the way of education, and he should be glad if any one could suggest a remedy for this evil. In his neighbourhood potatoes were grown to a large extent, and children were much employed in the cultivation of them.

Mr. SIDNEY fully understood the difficulty mentioned by Mr. Skelton; and it was for that very reason he was anxious that the instructions given in schools should be made more attractive. What he contended for was, that the education should be more interesting and useful, and less literary.

The CHAIRMAN thought that in thinly-populated districts the plan described by Mr. Marshall was one of the very best, so far as the servants connected with horse-keeping and plough-teams were concerned. But they were not the only class of persons who were required on a farm. There were also herdsmen, shepherds, and others, who must be early and late on the farm, and the difficulty in his own and many other cases was with reference to them. He believed there was amply sufficient labour in the country, but it was unequally distributed; and the cause of that unequal distribution he traced to the present law of settlement, by the action of which men were driven out of close parishes into open ones. He himself suffered much from this state of things. Within five or six miles of him there were parishes which abounded in labour; but in order to his obtaining it, the men would have to walk three, four, or five miles to and from their work. For his part, he was of opinion that landlords had made a great mistake in driving the labourers out of their parishes, from the fear that their estates would be charged with their maintenance during the period of sickness or old age. The loss sustained by having an insufficient supply of labour was much greater than that which would be occasioned by having to maintain the old and indigent labourer by means of a poor-rate. It would, therefore, go far to remedy the evil of the existing unequal distribution of labour, if a proper amount of cottage accommodation were provided on every farm (Hear, hear).

Mr. MARSHALL having said a few words in reply, on the motion of the Rev. C. T. James, seconded by Mr. Granger, the following resolution was unanimously agreed to—

“That this Club highly approves of the system of boarding, lodging, and maintaining yearly agricultural servants, as described and practised by Mr. Marshall, in Lincolnshire; and the meeting recommends his paper to the best consideration of landlord and tenant.”

A vote of thanks to Mr. Marshall, for his paper, was then passed by acclamation.

#### THE NECESSITY FOR SOME UNIFORM SYSTEM OF WEIGHTS AND MEASURES IN THE SALE OF CORN.

On the subject for the evening being disposed of, the Chairman again called attention to the general inconvenience and disadvantage attending the present system,

or rather want of system, upon which corn was bought and sold. In his own county, Northampton, a petition had already been agreed to, praying for an acknowledged uniformity, and suggesting measure by weight as the most feasible plan for carrying this out. Which ever might be thought the better, a standard bushel by weight or measure, he was of opinion that petitioning throughout the kingdom would be the best means for attaining the object they had in view.

A discussion ensued on the relative advantages of weight and measure, and it was ultimately resolved that—

“This Club is of opinion that a uniform system of weight or measure for the sale of corn is desirable.”

It was further resolved that the following gentlemen, with power to add to their number, form a committee to inquire into the best means of establishing such a system:—

The Chairman—Wallis, Owen, Overstone Grange, Northampton.

Almack, J., Beverley, Yorkshire.  
 Baker, R., Writtle, Essex.  
 Barthropp, N. G., Creetingham, Suffolk.  
 Bear, R., Godmanchester, Huntingdonshire.  
 Bennett, W., Cambridge.  
 Bradshaw, J., Knole, Surrey.  
 Brickwell, C. J., Overthorpe, Oxon.  
 Buckley, J., Normanton Hill, Leicestershire.  
 Chowler, W., South Muskham, Notts.  
 Congreve, T., Leamington, Hastings, Warwickshire.  
 Davy, J. T., South Molton, Devon.  
 Druce, S., Jun., Eynsham, Oxon.  
 Granger, T. W., Stretcham, Cambridgeshire.  
 Gray, W., Courteen, Northamptonshire.  
 Hudson, J., Castleacre, Norfolk.  
 Little, E., Laudhill, Wilts.  
 Marshall, J., Riseholme, Lincolnshire.  
 Overman, H., Weasenham, Norfolk.  
 Owen, T., Clapton, Hungerford, Berks.  
 Pain, J., Felmersham, Beds.  
 Pawlett, T. E., Beeston, Biggleswade, Beds.  
 Pope, E., Great Toller, Dorsetshire.  
 Ramsay, G. H., Derwent, Northumberland.  
 Rigden, W., Hove, Sussex.  
 Saberton, T., Witcham, Ely, Cambs.  
 Sainsbury, W., West Lavington, Wilts.  
 Shearer, B. P., Swanmore, Hants.  
 Sidney, S., Peckham, Surrey.  
 Skelton, S., Sutton Bridge, Lincoln.  
 Smith, R., South Molton, Devon.  
 Stratton, R., Broad Hinton, Wilts.  
 Tatam, H. H., Moulton, Lincolnshire.  
 Thomas, J., Bletsae, Beds.  
 Thompson, W., Thorpe Hall, Howden.  
 Trethewy, H., Silsoe, Beds.  
 Ward, B. E., Drayton, Rockingham.  
 Webb, Jonas, Babraham, Cambridge.  
 Webster, W. Bullock, The Knoll, Glamorganshire.  
 Webster, J., Peakirk, Market Deeping, Linc.  
 Wells, J., Booth Ferry, Howden.  
 Williams, J. A., Baydon, Wilts.  
 Wood, J., Ockley, Sussex.

## THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND—ITS PAST AND PROSPECTIVE.

This Society can now look back upon a career of nearly twenty years, during which it has gradually and widely extended its uses and influence. In almost every way the realization of the idea has been a success, and very deservedly so, too. The founders of such an institution could scarcely have contemplated greater results than have been already arrived at. The difficulty, indeed, would be to say what the Agricultural Society of England has not touched on; or in what field its improving hand is not manifest. The diffusion of our best breeds of cattle, the adoption of our best kinds of implements, the more general application of science to our requirements, may be all traced in a greater or less degree to the fostering care of this association. It has taught both landlord and tenant many a practical lesson neither would have learned by any other means; while it has earned for the business of farming a position and respect it could never have achieved without the aid of some such national organ.

We repeat, that the Society has merited its prosperity. The mere record of not only what it has attempted, but what it has performed, is, after all, the best commentary upon its character and direction. From the very first the owners of the soil have united with the tenantry in furthering its progress and intentions. It is satisfactory to feel that the country gentlemen have thoroughly identified themselves with the Society. It was, of course, part of the original design that they should do so, and it will be but a bad omen when they do not. We really believe that the Royal Agricultural Society of England—with its Monthly Councils, Annual Shows, and half-yearly Journal—has done more to make good landlords than any other recipe that ever was or will be devised. Too many, until they thus met in conference together, “left it all to the agent.” After some initiation here, however, a man must put a few home questions. Is his own land drained? Have his own tenantry good buildings? Have they the offer of long leases or equitable agreements? Is he, in a word, doing his best to advance agriculture, or is he only talking about it?

There is nothing shows more the honesty and goodwill of the English farmer than the heartiness with which he welcomes his landlord to a participation in such labours. The gentlemen have been thus welcomed in Hanover-square; with some of the first farmers in the kingdom always at hand to steady their deliberations, and confirm, as it were, their resolutions. At the same time the influence of those in high places has had its effect in supporting and maturing the plans of the practical man. As may be imagined, nothing could have worked much better. It is a good sign for Agriculture when she can show, amongst many similar

“pairs,” such men as John Hudson and the Duke of Richmond, Lord Yarborough and Jonas Webb, taking sweet counsel together.

Beyond even this desirable association of the two great classes of landlord and tenant, the Society has such a working staff as could be scarcely improved. Where, for instance, is another man fitted for the place like Mr. Hudson, the Secretary? Or, as Mr. Brandreth Gibbs, the director of the shows? Or, as those twin brothers of the arts, Professor Way, with his great abilities and plain simple method of initiating us into the subtleties of science, and Mr. Simonds, with his zeal in rendering veterinary practice more generally available? It is rarely in one age that such another Editor for the Journal could be found as Mr. Pusey. Still the tastes, talents, and *tried* merits of Mr. Wren Hoskyns, Mr. Thompson, and Mr. Ackland, all stand in strong assurance of their fitness for the divided duty they have accepted.

And yet in the face of all this there is no denying that the Society is the subject of some animadversion. The truth is, that the Council do not sufficiently consult or act upon the opinions of the general body of members. There is more than a disinclination to adopt any suggestion coming from without the magic circle. We have long ere now had frequently to repeat this. We have shown for years past that instead of encouraging the attendance and advice of the whole body of members, a precaution seems to be taken to secure exactly the reverse. Take, for instance, the only other two occasions upon which general meetings of members are held—the Friday in the July, and the Saturday in the December show week; the two very days on which it is well known scarcely any members will be left to make their sign. As far back as Gloucester, we think, it was when we called attention to the one; while as for the other, as regularly as the Smithfield week comes round, we have to regret the apparent mockery of a meeting which is held when everybody has gone home again.

It is in every way essential that these general meetings should be appointed with the aim of obtaining a good muster of members. The first step to be taken with a grumbling man is to hear him out. There are many such demurrers now going about the country, that have only to be heard to be answered. We can say from our own experience, here and there, that we have had to listen to more wild impracticable schemes for “improving” the Royal Agricultural Society, than were ever devised for paying the national debt, or bringing to bear the occult science of alchemy. Some of these, emanating from very good men, have merely to be explained away. Still, until you give a man the chance of an open hearing, he will go about sagely insisting that the Royal Agricultural Society should have

no more country meetings—that they should all now, after a twenty years' cycle, be held in the same place, somewhere near London—say in the Crystal Palace. Or, that all cliques should be straightway put a stop to, and no one allowed to remain, or, be elected on the Council but the grumbler himself and his own party of very particular friends. Or that the Society should have nothing more to do officially with agricultural implements, for the very good reason that it had done quite enough—for some people! Or that Professor Way should turn peripatetic philosopher, and give a series of entertainments throughout the country, like the Wizard of the North, or the unhappy man with a "horrorary." Or, that all the judges of everything should be chosen by one man or so—and so on. We

have had all these gravely and modestly put to us, until one begins at last to remember the old man and his ass, and again to echo—What is the Society to do?

*Hear them out.* Invite them boldly before you. It will not take long to distinguish good men and true friends from mere grievance-mongers, professed agitators, or self-sufficient authorities. Act cheerfully and readily upon good advice. Amend those things that time and the very advance of the Society have rendered necessary. Above all, encourage still further landlord and tenant to act here, at least, in harmony together; and the position and prospects of the Royal Agricultural Society must be, as they should be—a matter of honest congratulation.

### MR. BAKEWELL'S ANECDOTE, *ALIAS* GOOD FARMING IN A NUTSHELL.

SIR,—The far-famed Mr. Bakewell, of Dishley, Leicestershire, the founder of the new Leicester sheep, and the man who lived a century before his day, used to tell an anecdote with exceedingly high glee of a farmer of the olden school and golden times. This farmer, who owned and occupied 1,000 acres of clay land, but poor in point of money, had three daughters looking their father very hard in the face for money. He went to Mr. Bakewell to know what to do for them. Mr. Bakewell told him to keep his money and give each daughter some land, and make it known that he would do so, and he would very soon lessen his family at home. He then made it known that he would give his eldest daughter 250 acres of land. I need not add that the lady had forthwith plenty of beaux to choose out of: the father's house was haunted with young men, and she soon got married, and the father gave her the portion that he promised, but no money; and he found by a little more speed and better management the produce of his farm increased. Three years after he made it known that he would give his second daughter 250 acres of land, which drew shoals of beaux, and she soon got married, and the father gave her her portion. He then set to work, and began to grub up his furze and fern, and ploughed up some of his poor furze land—nay, and where the furze covered in some closes nearly half the land. After giving half his land away to two of his daughters, he found the produce of his farm increased; because his newly broken-up land brought him excessive crops. At the same time he farmed the whole of his land better, for he employed four times the labour upon it; had no more dead fallows the third year; instead of which he grew two green crops in one year, and ate them upon the land. A garden, Mr. Bakewell told him, never required a dead fallow. He no more folded from a poor grass close to better the condition of a poor ploughed one. But the great advantage was, that he had got the same money to manage 500 acres as he had at first to manage 1,000 acres. Three years after the second marriage, he made it known that he would give his third and last daughter 250 acres of land. She had a beau stood in readiness, and three or four more within call, and she was married in a week. She thought it never too soon to do well, and the father portioned her off with land. He then began to ask himself a few questions, how he was to make as much of 250 acres as he had done of 1,000 acres. He found necessity was the mother of invention. He then paid off his bailiff, who weighed twenty stone: he found that he had been helping the men to manage

the master, instead of helping the master to manage the men. He then rose with the lark in the long days, and went to bed with the lamb. He got much more work done for his money; for, instead of saying to his men "Go, and do it," he said, "Come, my boys, let us go and do it." He found a great difference between "come" and "go." He made his servants, labourers, and horses move faster—he broke them from their snail's pace: he found the eye of the master quickened the pace of the servant. He grubbed up every bit of furze on the farm, and converted a great deal of corn into meat. He preserved the black water, the essence of the manure, and conveyed it upon the land. He cut down all his high hedges, straightened his zigzag fences, cut his serpentine water-courses straight, and gained much land by so doing: made dams and sluices, and irrigated all the land he could. Some of his hedges and borders were covered with bushes from ten to fourteen yards in width, and some of his closes were no wider than streets; and there he grubbed up the hedges and borders, and threw several little closes into one. He found that, instead of growing white-thorn hedges and haws, to feed foreign migratory birds in the winter, he ought to grow food for man. "I sold him longhorned bulls, and let him rams," said Mr. Bakewell, "and told him the value of labour, and what ought to be performed by a certain number of men, worked oxen, or horses, within a given time. I taught him to sow less, and plough deeper and better, and that there were limits and measures to all things; but, above all, the husbandman ought to be stronger than the farm. I taught him how to make hot land colder, and cold land hotter; light land stiff, and stiff land lighter. I advised him to breed no inferior cattle, sheep, or horses, but the best of each kind, as the best consumed no more food than the worst. Size has nothing to do with profit. It is not what an animal makes, so much as what it costs making."

My friend became a new man in his old age, and died rich, by Mr. Bakewell's improved management. May not the English statesmen and the lords of the soil, of the present day, take a lesson from Mr. Bakewell, and look at Great Britain and Ireland, having now 12,500,000 acres of waste, improvable land—a wilderness for the want of labour; and half England, that is called "farmed," is not half-farmed, for the want of a North Lincolnshire tenant-right—*alias* justice—for unexhausted improvements. And there is as great negligence in working the soil in Great Britain and Ireland now,

as there was upon the farm of 1,000 acres, before the owner was taught by Mr. Bakewell. Common-sense calls out aloud, far and wide, and says that the owners of the soil are responsible and answerable for all the bad farming in Great Britain and Ireland, all for the want of justice between landlord and tenant; and it is as plain as the sun at clear broad noon-day,

that if half the land in Great Britain and Ireland were farmed under tenant-right, it would produce more than the whole does now, by bringing the waste improvable land into high cultivation.

SAMUEL ARNSBY.

18, Norfolk-street, Hyde-park, London,  
April 8.

## LEICESTER SHEEP AND SHORT-HORN CATTLE.

I have ever been of Mr. Grey's opinion, that the average weight of sheep in 20 lbs. per quarter is the most eligible for general use, and the farmer's object is clearly to possess a flock of hardy, compact, and woolly animals of medium size—quiet in habit, and possessing aptitude to fatten, quality of flesh, and an early maturity; and I further agree with Mr. Grey, that on land suited to the Leicester sheep, and under duly favourable circumstances, in flocks of considerable size, and ordinary keeping, no breed will be found to equal the sheep now used in Northumberland under the name of the Leicester breed. Mr. Grey makes a statement of true utility, which discards all overgrown bulks from stall feeding, with a restriction to suiting the markets with an average weight of 20 lbs. per quarter, or which may range from 16 lbs. to 24 lbs. The due fecundity is preserved in about one-third of the ewes producing twin lambs, and the ordinary keeping of grass pasturage in summer, and turnips to assist during winter. The fattened state happens at the age of two years, when the best animals are sold from turnip feeding, with the second fleece unshorn, and the more backward are sent to graze, are shorn, and sold during summer. The draft ewes are yearly fattened on turnips, or sold lean to the southern counties, bear another crop of lambs, and are fattened. This breed has resulted from importations of the original Leicester sheep by the Culleys, the well-known improvers of that country, and have been preserved in much purity by the breeders and localities mentioned in Mr. Grey's letter. Probably the animals inherit as much of the true Bakewellian type as any Leicester sheep in England, if the size be not rather small. But this want may be fully compensated by the utility that is now confirmed by the soil and climate.

All cross-bred animals, as Leicester sheep are understood to be of mixed descent, possess a large faculty of adaptation to soil and climate, which produces as many varieties and modifications of the breed, as there are employed fancy and judgment in the propagation, and arable culture in the maintenance. Even in North Northumberland, from which Mr. Grey writes and describes the useful sheep, I found, during my tyro residence in it, and within a few miles of each other, several varieties of sheep—open and close woolled, piled and curly coats, delicate skins, large and small faces, with straight and arched frontal bones. The results may be of fancy or judgment, of accident or carelessness; still the Leicester sheep there are much more uniform than in the midland and southern counties.

When I lived in Leicestershire, I knew the flocks of Mr. Smith, of Dishley, of Swarkestone Lowes, near Derby, and of Mr. Hassall Hartshorne, near Ashby-de-la-Zouch, eminent breeders at that time, or 20 to 25 years ago. Each breeder possessed a variety of sheep, or his own breed, that was not only unlike his neighbour's, but not resembling among themselves, and from a flock two or three sorts could be culled that were very dissimilar in shape, size, wool, and face. Larger than the Northumberland breed, the animals were more silky and loose in flesh, and showed a very considerable relaxation from hardness. Though the herbage is rich in Leicestershire, it is not luxuriantly flaccid, but is sufficiently rigid and concentrated to sustain a firm muscular consistency. These differences could not arise from the soil, but from the tendency of the animals, and fancy of the breeder. I recollect Mr. Stokes of that county, who is known as a judge at shows, was in possession of a small-sized variety, compact and close-woolled, which might be doubted to have been the Leicester sheep, as appeared around him; the animals were produced by his own judgment, and were exactly what Mr. Grey describes as useful sheep in ordinary keeping.

The public shows of fat and lean sheep exhibit the same large variety of appearance in the Leicester breed. The silken delicacy of Nottinghamshire is not of general utility; the large carcasses from Lincolnshire, with thin and open coats of wool in curly piles, large heads with arched frontal bones, and even the prized sheep of Bedfordshire, are not to be considered as pure Leicesters, but modifications from fancy and circumstances. This result was most obvious at the late fat cattle shows of the Smithfield Club, where the true Bakewellian type was nowhere to be seen, and that in the opinion of the most enlightened observers. The animals exhibited were refined sheep, but hardly to be referred to any standard.

Though physiologists have not yet been able to establish the certainty of "species," inheriting persistent and permanently-impressed qualities, which adhere and will return after a long series of gradations, yet there is more than a probability attached to the supposition that all crosses, mixed descents, and hybridal productions, though upheld for a time, will degenerate and dwindle, and ultimately become extinct, or divided and split into so many varieties and modifications as to render any original type or standard impossible to be recognised. Of this result the Leicester sheep have begun to exhibit most unequivocal symptoms, and it is very probable that

some such attempt as is now being made by Mr. Clarke, of Long Sutton, to improve the Lincoln sheep among themselves, will proceed on a solid basis to rear a superstructure that will overtop its predecessors, and occupy the place of the previous erections. Such a variety as now occupies Northumberland may continue to exist for a length of time, being firmly established in a uniform character, inured to soil and climate, and enjoying the preference in practical judgment. Mr. Grey's expression of "ordinary keeping" conveys a most important lesson on the subject of sheep management, that extras are not to be admitted into general calculation, nor any results to be estimated that are not accessible to common means.

The best sheep at present for the purpose of the butcher are the Down and Leicester Cross, as exhibited by Mr. Overman, of Norfolk; and similar crosses are being tried with the Cotswold long-woolled sheep. Such animals, however useful, are only a production, and can never become a breed or variety, from having no elemental means of self-support: but the means may be specially provided, in order to produce the valuable articles.

The Shorthorn cattle are situated as the Leicester sheep in a cross descent, and a very strong propensity to constitute varieties and modifications, according to the circumstances of soil and climate, and the general treatment. In this propensity the cattle much exceed the Hereford and Devon breeds; and though the degeneracies are large from the pure excellence, they are still found to be far from the native cattle, and always exhibit general traits of the true breed. The cross descent from the York cattle and Scotch Galloway breed may confer this propensity, which is most peculiarly fitted for exportation, and has very much enhanced the value of the animals. Among the best-reputed herds of Shorthorn cattle, very much difference is seen to exist in colour, shape, size, and in general conformation. Two varieties exist: the one claims a descent from the Yorkshire cattle, improved among themselves; the other, termed in reproach the "Alloy," has sprung from the cross of the York cattle with a red Galloway cow. This last is much the most numerous variety, and forms the herds of the most noted breeders of Shorthorn cattle. The first is fine in the bone and smaller in size, with an amazing tendency to fatten, and with a weight of flesh on the least quantity of bone and with least compass, that exceeds all fattened animals in the United Kingdom. The variety is exhibited by Mr. Wiley and Mr. Booth of Yorkshire, and some others of that celebrated county. The other cattle, or the "Alloy," are larger in size, coarse in the bone, leathery and shaggy in the neck, with a most ponderous coarseness of bone in the fore-quarter, which produces much bareness of flesh on the shoulder and fore-arm. The very best breeders have not been able to banish from their herds this coarseness of fore-quarter and shaggy neck. The cattle of the late and present Earl Spencer are of this sort; also Mr. Stratton's prize oxen of two years past; and of many other possessors of this breed. The long-remembered ox of Earl Spencer's, exhibited some years back, was

coarse and heavy in the bone, and not fine in the quarters. To look at the varieties of these animals, arranged in a juxtaposition, it is hard to imagine a source of descent that is the same in kind or degree: the same name may be applied, but very wide discrepancies are to be allowed.

The only superiority of Shorthorn cattle lies in the very ample development of the hind-quarter, in the length and depth of thigh, width of buttock, and the perpendicular up-standing of the posterior animal. From the mid-ribs forwards, in the covering of flesh on the shoulder, and in the slope of the shoulder in to the neck and ribs, the animals are much surpassed by the Hereford and Devon breeds; which, not being mixed in descent, but improved among themselves, are much more uniform in character, and present few or no deviations from an established type. The large girth of the Shorthorn cattle arises in most cases from a downward flattened shape of the fore-ribs, that are not regularly curved, and which has been clearly inherited from the Galloway cattle of Scotland. This girth not being supported along the carcass, but tapering backwards like a tree from the root end, falsifies the calculations of weight from measurement, from being a too large dimension in one place. On the other hand, the posterior width of carcass is far best supported by the Shorthorn cattle, likening the frame to a square; while the Hereford and Devon oxen, by losing the posterior width, or narrowing behind the hook bones, present the figure of a trapezium.

The animal carcass is circular, forming a cylindrical barrel, that extends between the ends of shoulders and thighs, which close the extremities, on which are placed the legs that support the body, and afford the locomotive power. A circle is the most handsome and capacious of all geometrical figures, and contains within its area the greatest possible extent of space, of which the exact proportion to a square has never been found. The improved animal carcass tends to form a square by a level back, straight under belly, shoulder, ribs, and thighs in a line, and both sides being equi-distant in every point. This perfection is attained by the rotundity of the barrel, and by the girth being uniform along its extent. The height of the animal and deep flat ribs show a seeming large bulk of materials in aggregation; but the failure soon appears when compared by measurement with a lower stature, a uniformly cylindrical barrel, wide thighs, full girth, and shoulders overspread with flesh. The circular frame, and not the deep flat carcass, maintains the dimensions of weight.

Two most notable instances have lately occurred of this superiority of shape over bulk, in Mr. Ambler's shorthorn heifer, and Mr. Towneley's shorthorn cow, that were exhibited at the Smithfield Club fat cattle shows of the two last years; and gained, the first animal, a prize of small value, and the last a larger prize, and the gold medal as the best cow of any class. These decisions were much reversed at Birmingham; the first being promoted, and the latter rather thrown into the shade. Both animals seemed clear of the alloy, and

exhibited most unmistakeable proofs of the highest degree of breeding. The uniformity of cylindrical barrel was maintained in a most superior manner, almost beyond recollection; while the deeply rounded shoulders and the fore-ribs were covered with flesh that excited universal admiration. Mr. Towneley's cow was only two inches of less girth than the Duke of Rutland's shorthorn ox, which gained the gold medal in 1854, and which presented to the observation a much larger bulk and an extent of dimensions of not less than one-half more than the cow; but the ribs were deep and flat, girth comparatively lean and not circular, length disproportionate to the depth of carcase, back sunk, and the belly depending—forming a by-no-means symmetrical carcase, but with much posterior width and a head of a large emasculation. These two qualities could not balance the former deficiencies, and whatever general merits have been ascribed, the most approved form of the animal frame was not exhibited. The cow presented nearly the same weight in a compass of much seeming less extent, and the superiority was undoubted on the most incontestable ground of preference, or the greatest weight in the smallest compass.

The best similitude of a fattened carcase of the proper symmetry, is a cast-iron roll of towards 6 ft. in length and 3 ft. in diameter, or about 9 ft. in circumference; which is nearly the utmost girth attained by the largest-sized animal. The cylinder preserves a uniform girth in every point; and though some deviation must be allowed in a living organism, which is capable of assuming different forms over the inert matters, that retain any impressed form, yet the thickness of the cylinder at the fore-end joining the shoulders must not be much increased, though something must be allowed, as it destroys the uniformity of girth, and falsifies every attempt of calculation of weight. The chest must be deep and capacious, in order to afford room for the play of large and healthy lungs; but the ribs behind the chest must be curved into a barrel, and not lengthened downwards, forming a large girth in appear-

ance but not in measure, that is immediately lost before the mid rib is reached. The hind girth over the hips, midway between the rump and hook-bones, must be nearly the same as that of the fore-ribs, and commences on the thigh in a line with the under belly and lower flank, thus reducing the carcase into a correctly defined compass.

In the above expressed views of our judgment of fattened animals, Mr. Towneley's cow of 1854 exhibited a specimen of cylindrical barrel, true on every point of girth, such as our recollection can hardly bring forward an equal, and certainly no superior. The award to the animal of the gold medal, and of a high prize, fully justifies our commendation.

Whatever may be the ultimate result of cross breeds, mixed descents, and amalgamation of qualities, if the original work be wholly lost as it came in the stereotyped edition of Bakewell and Colling, in the Leicester sheep and Shorthorn cattle, and if Nature has decreed that there may be special improvements but not permanent mixtures of its living works, even then the primary object has been answered in the breeding of animals, by the production of refined varieties and modifications which exist, as with Mr. Grey, in useful sheep "in considerable flocks and ordinary keeping"—by breeding such animals as Mr. Overman's, which were in our opinion the most handsomely fattened sheep in last show, especially the single specimen, No. 186 of the Catalogue—and by producing Mr. Ambler's heifer, and Mr. Towneley's cow; all which show that refined materials are in existence, and continue a highly useful propagation. The varieties and modifications will progress in introducing refinements, and settle into independent flocks and herds long after the original source has disappeared—refined animals will be propagated, of whatever name, class, or origin; and prizes may be given to the best animals irrespective of any strict alliance. And thus the refinement of organizations has answered a wider purpose than if restricted to one single type, which, though sunk from view, will continue to infuse its qualities through many ramifications, that will again be extended into future growths. Mr. Overman's sheep could not have been produced without the Down and Leicester improved breeds, nor the elements found without the genius of Ellman and Bakewell. In whatever way the progress may advance, the value of the origin is unimpaired. J. D.

## ARTESIAN WELLS AS TRIED ON THE ESSEX MARSHES.

The marshes of Essex suffered formerly from a deficiency of wholesome water for the inhabitants and the cattle. The defect has been remedied by means of artesian wells bored down to a considerable depth, from which the water rises to the surface. As the success of these wells depends entirely on geological structure, and as the landowner would be grievously disappointed who should attempt to obtain a supply of water by such means in a situation where the conditions necessary to success are absent, it may not be amiss to explain what these conditions are: such explanation may prevent a fruitless waste of money in attempts to sink such wells in improper situations; at the same time it may convey a useful lesson to those who deny the practical value of geological knowledge. We are quite willing to admit that, except in one respect, such knowledge is not of much value to the farmer, so far as the mere

cultivation of his farm is concerned. A man may be able to raise good crops, and to convert them profitably, without knowing what formation he is on; and we do not think he is at all likely to produce better crops, or to farm more profitably till possessing that amount of geological knowledge. To the landowner and the land-agent geological knowledge is of the highest importance. It must be, though, something more than that he may derive from looking at the geological map he may see in every map-shop window, and at almost every inn he frequents. A formation is a group of strata, consisting of sandstones, clays, limestones, &c., in many alternations, containing a group of fossils common to them all, and distinct from those of other groups, which may or may not possess the same composition, or one so nearly similar. Clay may prevail in one formation, sandstone in another, and limestone in a

third. Every formation, however, consists of many alternations of different composition; and the same bed in any part of a formation, and even the whole formation, varies horizontally, so that it shall be of a different mineral composition in one district to what it is in another.

Having premised this, we proceed to describe the geological conditions necessary to the success of an artesian well.

The first consideration is, that there shall be a porous or water-bearing stratum between two beds impermeable by water: the second condition is, that these strata shall have been thrown into a basin-shaped position. This might be illustrated by a diagram, but we will endeavour to make it intelligible without. Take two common earthenware basins of different sizes; hold the smaller within the larger, and fill the open space between them with sand; saturate this sand with water; pierce a hole in the upper basin, which if it be a pewter basin, may easily be done; insert a pipe, and the water will rise in it to a height proportioned to that to which the water is kept in the sand between the two basins. This represents an artesian well near London: the lower basin represents the chalk, which rises to the surface on the hills of Kent and Hertfordshire; and the sand between the two basins represents the sands of the lower part of the eocene tertiaries; the upper basin represents the London clay. These strata, originally horizontal, have been thrown into this basin-shaped form by subterranean movements. It is by boring through the clay represented by the upper basin that the water of the artesian wells in the neighbourhood of London is obtained. When first recourse was had to them the water not only rose to the surface, but to a considerable height above it. As the number of these borings was increased, the water no longer rose to the surface, and pumping by means of steam-engines became necessary. The result is, that by a continual drain on the supply, the water level in these wells is sinking at the rate of from one to two feet annually.

The depth of the artesian wells in Essex varies from something less than 100 to 450 feet. The supply is small, rarely exceeding a few gallons per minute, and sometimes even less than a gallon, and is, on the whole, a great bore to the district. On the south side of the Thames, owing to variations in the sinking of the water-bearing strata (sands) and the prevalence of impervious strata clays, conditions not to be ascertained from any geological maps extant, the success of these artesian wells is very variable: some still produce a constant supply, which rises above the surface; while others, as at Cobham, 412 feet, Sandgate, near Chertsey, 600 feet, Knaphthall, near Woking, 480 feet, have reached the lower tertiary strata, but owing to the great development of certain clay beds, no water was obtained.

The chalk itself, however, is only partially retentive. There are water-bearing strata in it, and artesian wells bored in that formation have yielded considerable supplies of water. On the other hand, there are portions of

the chalk closely adjoining, where they have failed altogether. "Unlike the arenaceous strata," says Mr. Prestwick, "through which water permeates with great facility in all directions, and where it tends to take the form of large sheets coextensive with the strata—the percolation of water in the chalk occurs partly in the seams of bedding, and partly through fissures irregularly disturbed, the direction and dimensions of which can be determined only by experiment. Below the chalk again is another formation permeable by water: the upper green sand rests on an impermeable bed of the gault clay. The thickness of the upper green sand varies from 50 feet in Surrey to 140 feet west in Wiltshire. It consists of, in both localities, two members, permeable by water in different degrees. No attempt, however, has been made of late, in the neighbourhood of London, to penetrate through the chalk, and to show experimentally what sources of water supply exist beneath that deposit, till the publishing of the work by Mr. Prestwick, on the waterbearing strata round London. He proposes to bore artesian wells through the upper green sand and gault, to the lower green sand, for the supply of London. A description of the artesian well at Grenelle, and the failure of the attempt made to pierce the chalk by a similar boring in London, together with the causes of the failure, must be reserved for future consideration.

#### QUERIES RESPECTING THE CORN TRADE.

SIR,—Your previous willingness to answer any queries addressed to you, has induced me to submit the following:

What is the average amount of wheat and flour imported into Great Britain and Ireland during the last three or four years?

What portion of this yearly supply have we received since the 1st September? and how much do we require from abroad yet, to complete the average quantity up to the 1st September next?

The reduced stocks on the 1st September last left us wholly to the production of our last year's crop, and imports since; consequently, if we had not above an average crop last year, and if our imports are as yet below the average for the present year, from whence are we to obtain as much from abroad as we shall require to meet the next four months' consumption, till we get another harvest?

We have a yearly-increased consumption, from our regular increase of population, which requires regularly-increasing importations; and, after the very heavy losses sustained by importers for the last six or seven months, can we fairly calculate upon the required efforts being made to bring a supply commensurate to our actual wants? Should our calculations of plenty—as is so generally put forth—turn out incorrect, what, in the event of any interruption to the maturing and saving of our coming crops, would be the state of this country in August and September next, with (at present) no great promise of the American crops, and perhaps a deficiency, and all the accidents depending on the state of the harvest on the Continent?

The above queries and suggestions are of a serious nature; and it would be satisfactory to ascertain the real state of the case, to set the people right, and the corn trade in particular, on this important subject.

I remain, Sir, yours respectfully,

Liverpool, May 14.

A SUBSCRIBER.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held on Wednesday, the 22nd of April. Present: Colonel CHALLONER, Trustee, in the Chair; Lord Bridport, Mr. James Chapman, Rev. L. Vernon Harcourt, Professor Jacquemyns (of Ghent), Mr. Thomas Martin, Mr. Nesbit, Mr. Paget, M.P., M. Racotta (of Bucharest), Mr. H. A. Smith, Professor Way, Mr. Burch Western, and Mr. Wrench.

NOTE ON THE DEPOSITS OF GUANO ON THE CURIA MURIA AND SOME OTHER ISLANDS: by J. C. Nesbit, F.G.S., &c., Principal of the Agricultural and Chemical College, Kennington, London:—

“Many inquiries are constantly made as to the exact position of these islands, and as to the facilities they possess for the anchorage and loading of vessels; perhaps, therefore, the following description of them, from Horsburgh’s Indian Directory, page 264, may not be uninteresting to the Society. ‘Curia Muria Islands, fronting the bay of the same name, are high, situated nearly east and west from each other, distant 5 or 6 leagues from the opposite coast, may be seen 14 or 15 leagues, and are very barren islands. Halki, the westernmost, is small, situated in lat. 17 degs. 29 min. N., long. 55 degs. 40½ min. E. Sardi, the second, bears east 15 miles from Halki. Halabi, the third, in lat. 17 degs. 30 min. N., long. 56 degs. 5½ min. E., is the largest island. Deriabi, the easternmost, is in lat. 17 degs. 31 min. N., long. 56 degs. 23 min. E. Exclusive of these four islands, an islet, called Rodando, is situated 2 or 3 leagues to the N.E. of Halabi. They are steep to seaward, no soundings got until very near Halabi, 65 fathoms within half-a-mile of the S.W. end. Variation here 5 degs. W. in 1821. The channels between the westernmost islands and the main are safe, with soundings in them; the other channels betwixt the other islands are also thought to be safe; but that formed by Halabi and the easternmost island Deriabi is the best, having soundings in it from 42 to 36 fathoms within 3 miles of Deriabi. Low points project from the N.E. parts of Halabi and Sardi, on which the sea sometimes breaks. From Cape Fartash to Cape Monteal, the currents often run against the wind in the easterly monsoon; but among the Curia Muria Islands they are very fluctuating, and frequently set to the north-westward into the bay. This may soon render it unpleasant when a ship is becalmed close to the islands; it seems therefore prudent to pass outside of them, except when land and sea breezes prevail near the coast, to enable her to make considerable progress against the monsoon by keeping near the land. On the 23rd and 24th of November, 1799, Admiral Blankett’s squadron from Mocha, bound to Bombay, was becalmed close to these islands when endeavouring to pass between Halabi and Sardi, and afterwards went through the eastern channel. Captain Smith, with a convoy of 17 sail, worked to the eastward of the islands in 1781-2, had land and sea breezes in the bay of Curia Muria, the soundings generally regular from 34 to 27 fathoms. The land from Cape Monteal along the bay to Cape Chansely is high, and of an even appearance.’ The first authority who observed the existence of guano on the Arabian coast, as far as I am aware, was Captain W. F. W. Owen, commander of the expedition undertaken in H.M. ships *Leven* and *Barracouta*, for the purpose of exploring the shores of Africa, Arabia, and Madagascar. This expedition sailed in 1821, and was absent from England about five years. In vol. i. p. 347 of Captain Owen’s account of their voyage along the Arabian coast from Muscat towards Aden, is found the following passage:—‘We discovered that, by steering a S.W. by S. course from Massera, the shoals that extend from the land opposite to that island may be cleared. From Abdallah (the Arab

pilot) we learned that a south-westerly course would lead to Gezirat-ul-Hamr, the rocky island seen by the San Carlos. *Vessels from the Red Sea visit this place, to obtain the deposit of the numerous birds, which is said to be used by the Arabs for a cement in building.*’ From the foregoing description of this island, there can be little doubt that it forms one of those guano islands on the Arabian coast, of which the Curia Muria are the principal group. According to all the information in my possession, it appears that the first cargo of guano from these deposits was brought to this country, some years ago, in a vessel called the ‘Colchester.’ Some portion of this was sold; but several tons of it were, I believe, up to a recent period, lying unsold in some of the dock warehouses of London. Many years ago I made several analyses of this description of guano, which came to me under the name of ‘Red Sea guano;’ but I have not at present been able to place my hands upon the copies of the analyses. I am, however, able to lay before the Society copies of analyses which I made this year of samples of guano from the Arabian coast. These samples were taken in the year 1855, and were forwarded to Bombay, and subsequently to this country. This will in some measure account for the small amount of moisture which they contain. The approximate money value is determined according to the method indicated in my little work on agricultural chemistry:—

‘College of Agricultural Chemistry,  
Kennington, April, 1857.

## ANALYSES OF SAMPLES OF GUANO FROM THE CURIA MURIA ISLANDS, ON THE COAST OF ARABIA.

	No. 1.	No. 2.	No. 3.
	Per cent	Per cent.	Per cent.
Moisture.....	2.46	4.18	4.00
Organic matter, &c. ....	4.44	14.42	10.85
Silica, &c. ....	39.95	17.85	7.55
Oxide of iron and alumina ..	0.23	—	—
Phosphate ditto .....	15.29	4.70	3.05
Phosphate of lime.....	13.95	43.40	63.85
Phosphoric acid.....	0.23	1.66	A trace.
Alkaline salts, &c.....	4.17	13.70	4.50
Hydrated sulphate of lime, &c.	19.26	6.20	—
	100.00	100.00	100.00
Phosphates soluble .....	0.50	3.60	A trace.
“ insoluble .....	29.24	48.10	66.90
Total .....	29.74	51.70	66.90
Nitrogen ( <i>equal to</i> ) .....	0.71	1.48	0.71
Ammonia .....	0.86	1.80	0.86
Approximate value per ton about.....	£3 6 10	£6 5 1	£6 3 5

Several analyses of guano from this coast, made in Liverpool in the year 1853, by one of the chemists of that town, give, I am informed, very similar results. It is apparent that these guanos have suffered much from rain, as the amount of ammonia is small, and they have also received an admixture of earthy matter, probably owing to the sandy nature of the coast. No. 1 is particularly bad in this respect. No. 2 differs from No. 3 in containing more sandy matter; but both these, if the expense of importing be not too great, might do very fairly for root crops. It is said that some samples have been found which have not been much exposed to atmospheric influence, and which contain therefore a large amount of organic matter and ammonia. None of these, however, have come under my own notice;



nor am I acquainted with their probable relative amount compared with the other deposits. In Capt. Owen's narrative there is an account of another guano island on the African coast, near Zanzibar. His graphic description of this island and its inhabitants, which is subjoined, might apply with equal accuracy to almost any other place where guano is deposited: "On the 1st of January, 1824, we left Zanzibar, for the purpose of surveying and ascertaining the exact position of Latham's Island, or, as it is erroneously termed, Shoal. Although passing at a very short distance, by the greatest chance we discovered it, so small are its dimensions and so little is it elevated above the sea. It is situate in lat. 6 deg. 54 min. 2 sec., and long. 39 deg. 55 min. 5 sec. It is formed of coral, of an oval shape, about one thousand feet long, and between ten and twelve high, accessible only on the south-west side by a small shelving beach of coral sand: the surface is perfectly smooth, and composed entirely of the excrement of the numerous sea-fowl that resort thither. In some parts this incrustation over the interstices of the coral is not sufficiently hard to bear the weight of a man, as several of our people in the course of their peregrinations rather disagreeably experienced. The feathered inhabitants, being unaccustomed to molestation, are perfectly fearless: they appeared totally to disregard us, not even getting out of the way to avoid being trampled upon, and, if we attempted to touch them, they would endeavour as far as was in their power to repel the assailant with their sharp-pointed beaks. Some were of the sooty petterel kind, but by far the greater number resembled the gannet, and in point of size were little inferior to the goose. They presented a very singular appearance upon our landing, as the steep, rocky wall of Madrepore, that bounded the surface of the island, was covered by a complete phalanx of them, offering a most motley variety of shades, from the snow-white coats of the young to the dark bilious tint of the old ones. They hailed our approach by a shrill scream, and, without stirring, shot forth a lively expression from their bright golden eyes, deeply buried in the white downy mass that enveloped them. The surface of the island was literally covered with them; some of the hens sitting on their eggs, others tenderly watching their young in their first sally from their nest, or awkward efforts to fly; while the remainder, in large flights, alternately relieved one another in scouring the surface of the surrounding sea for fish, with which they returned in great numbers. Four of these that we took from them, together with some eggs, afforded the boat's crew a hearty meal. Before leaving this place we put up a lofty pole, inscribed with the date and name of the vessel, and then made sail for Zanzibar, where we arrived on the 6th of January, 1824." This island is of very small extent, and we have no evidence as to the quality of the deposit; but it is possible that a few ship loads might be obtained, supposing it to be worth removing. Another guano island discovered by the Americans is called the 'Isle of Jervis.' It is situated in lat. 0 deg. 28 min. S. and long. 159 deg. 46 min. W. It is nearly due south from the Sandwich Islands. Commodore Mervine, of the American navy, was sent by the United States' Government to survey this island and to report upon its deposits. The authorities do not, however, appear to have been satisfied with the accuracy or sufficiency of the report, and I am informed another expedition is to be sent there. In Keith Johnson's Gazetteer this island is described as being five miles in circumference, and covered with low shrubs. It would scarcely therefore be probable, if this account be correct, that any great amount of guano should be found there. Deposits of birds' dung have likewise been found on some small islands to the south of Cuba. From recent accounts from the United States it, however, appears that this guano contains no ammonia. The amount of phosphates is not stated. The presence of ammonia in only small and variable quantities may indeed always be safely predicted of birds' dung from any place where much rain falls; and we may safely assume that if any valuable deposits are discovered at all approaching in percentage of ammonia to those of the Chincha Islands, that they will be found in, or near, the rainless regions of the earth.

Mr. Paget, M.P., thought that the royalty of £1 per ton on the guano shipped from Kooria Moorria would be found too high a rate for the inferior deposits, and that cargoes of such

quality on their arrival in England could not realize remunerative prices in our manure market. In order to prevent such disappointment and consequent discouragement among the shipowners, he thought it would be very desirable if competent persons could be sent out to Kooria Moorria, who would on the spot decide by chemical test the actual value of the different deposits previously to their being shipped on speculation to this country.—The Chairman considered this to be a very important suggestion.—Mr. Nesbit remarked that the surgeons sent out with ships could be prepared for this chemical investigation by a previous week's instruction in the laboratory.—Professor Way thought that there was an exaggeration in the estimated value of the Kooria Moorria guano. The phosphate of lime, however, in guano was in a more favourable condition for the purposes of manure than under any other form. He referred to accounts he had received in private letters of further discoveries of guano in our West Indian possessions, where the supplies would not only be under the immediate control of our own government, but the expenses of freight across the Atlantic would be comparatively small.—The Chairman conveyed to Mr. Nesbit the thanks of the Council for his attendance at their meeting on that occasion, and the communication with which he had favoured them.

Mr. Leo, of George-yard, Lombard-street, favoured the Council with the following communication:—

"5, George-yard, Lombard-street, April 8, 1857.

"Dear Sir,—As there is no European commercial intercourse with the south coast of Arabia, from Aden to the Persian Gulf, there is little probability of its being quickly ascertained whether guano deposits exist elsewhere than at Kooria Moorria, unless the Council of the Royal Agricultural Society take steps to promote further research; and as the officers of the Indian navy have been among the best geographers in that part of the world, no doubt the East India Company would direct investigations to be made in search of guano deposits, if application be made to the Board of Directors.

"The native trade of all that part of the world centres in the Parsee merchants of Bombay, who are a most active and acute race, and it being made known to them what is doing at Kooria Moorria, and the object the Royal Agricultural Society has in view, it would very probably induce these people to make further search for supplies of the article through their native connections. Upon this point I think much practical information and assistance may be obtained from Dr. Buist, of Bombay, who I perceive, from last week's *Athenaeum*, has recently read a paper before the Asiatic Society, and must consequently be now in this country again; and as that gentleman takes so much interest in everything that concerns the welfare of our Indian possessions, I feel quite sure that he will be found a most valuable and willing coadjutor.

"To get the guano laid down here at the least possible cost, a correspondence should be kept up between the society and Captain Ord and his party, from whom you would soon be informed if any obstructions arise to their operations—a thing always to be provided against, and which could be so easily removed by the intervention and influence of the Royal Agricultural Society, as everything should be done to induce shipowners to send their vessels there to load; and nothing is a greater discouragement than a want of knowledge of what practical facilities there are for loading their ships, the nature of the coast, particulars of soundings, and the kind of protection to be afforded them in the case of need; and a number of other questions upon details are sure to arise, and which I feel confident would be of great assistance to Captain Ord in getting officially elucidated. Until the place becomes known to shipowners, you will find a great reluctance in them and in their captains to go there; consequently the Royal Agricultural Society has a direct interest in obtaining and disseminating all useful information on these points.

"The vessels taking out coals to Aden should have every inducement to go there to Kooria Moorria to re-load, and if good facilities be found for the purpose, plenty of other vessels would find their way there also, but the absence of them would greatly retard the object the Royal Agricultural Society has in view.

"If you should consider the foregoing remarks of any service in promoting a more speedy supply of guano, have the good-

ness to bring them before the Council, to be dealt with in any manner it may deem advisable.

"I am, dear sir, your most obedient servant,  
"Jas. Hudon, Esq., "THOS. LEE.  
"Secretary of the Royal Agricultural Society."

**CUBAN GUANO.**—Captain Lory, R.N., of St. Kerne, near Helstone, Cornwall, favoured the Council with the following suggestions:—

"Having observed in *Bell's Weekly Messenger* that guano deposits had been discovered in some of the small islands on the south of the Island of Cuba, and on the Isle of Mona, I take the liberty to make the following statement, which possibly, if attended to, might prove of some advantage to the agricultural interests of this country. I have mentioned the circumstance to many, but they assured me that the heavy rains in the West Indies rendered the guano perfectly useless as a manure; if, however, that found on the isles near Cuba be available, the deposits on the numerous small islands on the Great Bahama Bank, no doubt, must prove of equal value. About seventeen years ago, when in command of one of Her Majesty's packets, bound to the Havannah and Mexico, I was becalmed close to Cape Verde, a small island three or four miles in circumference, on the S.E. edge of the Great Bahama Bank, and at the N.E. entrance of the old Bahama Channel. The passengers and myself landed, and found the whole surface of the ground covered with sea birds, principally of the cormorant and booby kind, in all stages of life, from the egg to the old bird, the greater part so tame that we were obliged to kick them out of our way, and avoid treading on their eggs and young. Thousands (I believe I should be right in saying millions) of birds were constantly leaving and coming to the shore, perfectly fearless of us, caused, no doubt, by their habitation being seldom or scarcely ever visited by man, owing to its isolated situation. On part of the island there was a dense brake of prickly pear (vegetable), about six or seven feet high, on which there was an innumerable quantity of what sailors call 'man-of-war birds' (about the size of large gulls); they were very wild, but feeling their security from the impenetrable nature of their roost, they allowed us to approach within a few feet without being frightened away. We also observed several long thin snakes creeping about among the eggs and young birds. I have no doubt that the numerous islands on the Great Bahama Bank contain guano deposit to an immense amount, and should it prove an advantage to the landed interest the value must be incalculable, and as they belong to our Bahama colony we shall not be subject to foreign interference. Should my statement be considered worthy of the members of the Royal Agricultural Society, may I request you would be pleased to lay it before them, and I hope I do not take too great a liberty to recommend, as the cheapest and best means to pursue in order to ascertain facts that a competent person be sent out to Havannah or the Bahamas, where a small vessel could be hired to examine the islands in the neighbourhood, or possibly the Admiralty might allow a small vessel on the station to proceed on the discovery."

**CATTLE MURRAIN.**—The Earl of Clarendon favoured the Society with a continuation of the despatches received at the Foreign Office from her Majesty's Ministers and consuls abroad, in reply to the telegraphic messages his lordship had specially directed to be issued, for the purpose of obtaining the latest and most speedy information on the progress of the cattle murrain. The following summary may be derived from these despatches:—

**LUBECK, March 29.**—Absence of preparations either prophylactic or therapeutic to resist the invasion of the murrain; the only precaution resorted to at present being the establishment of a strict cordon on the frontier of the infected country, for the purpose of intercepting all cattle importations from those parts. No laws to prohibit the importation of animal matters, such as hides, horns, claws, or tallow, from contaminated countries, as Russia and Poland. Absence of all sanitary regulations. One farmer had preserved his cattle free from disease by separation of the healthy from the sick, with a distinct class of attendants

for each; by applying tar every alternate day to the muzzle, dewlap, legs, and claws, of the healthy as well as of the diseased animals; and by giving to the sick animals, at more or less distant intervals, according to the degree of illness, a salt herring dipped in tar. "This highly simple treatment has been successfully adopted ever since by the farmer alluded to, who, living in the midst of a contaminated district, saw his own cattle escape infection, or, when affected, soon recover." The disease in this case appeared in 1844, and returned in 1849.

**LEIPSI, March 30.**—Cattle in Saxony and in Central Germany for many years past occasionally suffering from inflammation of the lungs, limited to particular cases, and never of an epidemic character, probably brought by cattle from Holland. Best preventive measures, cleanliness and proper ventilation of the stalls. Curative measures not much to be relied on, but M. Boehme has tried with success "the introduction of a thread or other substance under the skin, so as to excite irritation there, and draw the inflammation away from the lungs. A solution of potash is also given to the cattle to drink by some practitioners." The cattle murrain of Poland, which is quite distinct from the lung disease here referred to, and which attacks the animals in their intestines and spleen, bringing on death in a few hours, is happily unknown in Saxony or that part of Germany, otherwise than by the reports of it which come from the Polish frontier.

**VIENNA, April 3.**—Blood of all animals infected with murrain, being highly infectious, they are killed by means of a sledge-hammer or mace. Essential that the whole of each slaughtered animal should be buried with its hide, horns, and hoofs. "No precaution can be too great against infection, so subtle as that which can be conveyed by any part of a diseased animal."

**M. R. EDGUMBE'S DISPATCH, OF APRIL 11, THE EARL OF CLARENDON.**

I have the honour to transmit to your lordship a translation of the report from the Ministry of the Interior, which Count Platen has sent to me, in answer to my request for information respecting the cattle disease. In this report it is stated the cattle plague (Rindespest), which advanced last year as far as the Oder, has not appeared in this country since the year 1813, and no opportunity has occurred for observing the disease. The cattle lung disease, which has latterly been so prevalent in France, Belgium, the Netherlands, and Holstein, first made its appearance in this country in the year 1807, but at present it scarcely exists here. I enclose a printed report which was made by the late Mr. Haumann, Director of the Veterinary School here, in 1846, on the lung disease of cattle. I have spoken with the son of Mr. Haumann, who is one of the first veterinary surgeons in the town, on this subject, and he told me that many methods had been tried for the cure of this distemper, but that the best, and that very uncertain, was the antiphlogistic method, salts internally, bleeding, and setons. The only means of prevention was separating the animals. Inoculation had been tried, but without success. I have received a letter from her Majesty's Vice Consul at Emden, stating that the disease does not prevail in that neighbourhood. The only information he was able to give on the subject was that cattle were not allowed to pass the frontier from Holland without previously being inspected by a veterinary surgeon.

**TRANSLATION OF THE HANOVERIAN REPORT OF APRIL 3.**

In the letter of the Royal Ministry for Foreign Affairs of the 29th ult., requesting information about the cattle disease (Hornviehseuche), for the purpose of forwarding such to the British Legation, we have to observe that it is left doubtful whether information was wanted about the "Cattle Plague" (Rindespest also called "Loserdurre") or about the "Lung disease of cattle (Lungeuseuch). The cattle plague had, as will be recollected by the Royal Ministry for Foreign Affairs, from the correspondence with the Prussian government, advanced in the last year to the River "Oder," where a stop was put to the disease by energetic measures. The kingdom of Hanover has been exempt from this very dangerous and contagious disease since the year 1813, because such cannot originate of itself

here, but has invariably originated in the Eastern Steppe-land, and has spread from that source. Accordingly in the latter time there has not been any opportunity of observing the disease here. The cattle lung disease (Lungeuseuche) being a peculiar disease to cattle, and having much spread in latter years in France, Belgium, the Netherlands, and Holstein, the inquiry of the British Legation is supposed to relate to the lung disease. The disease is known here since 1807, as appears from the annexed report of director of the Veterinary School, Mr. Hausmann, which was made in 1846. Since then no observations of any moment in regard to this disease have been made, as the disease afterwards only appeared in this kingdom sporadically, and every time, when it appeared it was possible to subdue it by the observance of seclusion in the respective farms. According to the above, there is no reason to be afraid of the disease becoming excessive, yet we have not neglected to establish some preventive measures against the introduction of the disease of the lungs from the kingdom of the Netherlands and the Duchy of Holstein. They consist on the Netherland frontier in a quarantine, and on the Holstein frontier in the production of sanitary certificates. An unconditional prohibition of the import of cattle has not yet been considered necessary on either of the frontiers. The report of Mr. Hausmann contains all the observations made here about the cattle lung disease so completely that nothing further can be added to it."

BERLIN, April 16.—Disease scarcely made any progress from the Silesian frontiers, owing to the stringent measures taken by the authorities against the importation of cattle. It is, however, more or less prevalent in the Austrian provinces bordering on the Russian frontier. The disease has not increased in the neighbourhood of Barymitzscherners and Meldiglaughen. The strictest measures of precaution enforced by the Russian authorities in the district of Gumbinnen and the circle of Tilsit. The disease had wholly ceased in the circle of Breslau and Oppeln, but cases had occurred at other districts on the Austrian frontier.

SIR G. H. SEYMOUR'S DISPATCH OF APRIL 21, TO THE EARL OF CLARENDON.

The directors of the Agricultural Exhibition of Vienna, which will take place at Vienna in the early part of next month, make known that the cases of disease (kindespest) which have occurred in Moldavia and Silesia have been confined to individual animals which have been imported, and that the cattle of the country is free from all murrain. It is further notified, that on the days appointed for the exhibition the transport to Vienna of cattle intended for the slaughter-house will not be permitted by railroad, and that the conveyance of the cattle to be exhibited will be effected in perfectly new waggons. I may observe that it cannot, I think be doubted, that the murrain prevails to a considerable extent in Gallacia, the importation of cattle of that province having been interdicted by the Silesian authorities. The Vienna Exhibition, I should further state, will open on the 9th of May.

Mr. Wood, of Hanger Hill, Middlesex, favoured the council with the following copy of an extract, cut out of a newspaper published during the period of the cattle murrain of the last century:—

The distemper which has for some time raged amongst the horned cattle, is a matter of such general concern, that it behoves every person who has it in his power to communicate to the public whatever may tend towards putting a stop to so great a calamity. Therefore, I beg leave, through your means, to acquaint all persons keeping cows with the following process, which a gentleman has tried on two milch cows apparently distempered, which had its desired effect in perfectly curing them:—As soon as the cow appeared distempered, which was by a running at the nose and eyes, attended with a looseness, swelling of the bag, and a high fever, or some of these symptoms, he had the beast well littered up, and kept warm, and clothed, and gave her a quart of tar-water every two hours for the space of 24 hours. He then gave her a pint every two

hours for 24 hours more, and afterwards half-a-pint every two hours till she recovered. During this process the gentleman made the following observations: that by the time the cow had taken down about three gallons of tar-water, she began to eat some fine hay; upon which, about half-an hour after eating some, he gave her two quarts of warm water-gruel, which she drank very greedily; on which as she continued eating, he increased the quantity of gruel till she drank near a pailful as she recovered; and that she broke out in blotches and sores on her udder soon after her taking the tar-water, on which he boiled some crude tar and hog's-lard together to an ointment, which he applied to the sores, and it healed them soon. He observed, likewise, that as soon as the cow was taken ill, her milk dried up, and what little could be drawn from her was of a yellow colour. He, however, advises that during the giving tar-water the cow should be drawn morning and evening, to get the infectious milk from her. He also thinks it will be proper to fix a rowel pretty low in the dewlap, which will greatly help to carry off the malignity sooner. When the cow seemed to be recovered, she had a little tar-water given her every four, then six hours, and afterwards morning and evening for some days; and in six days from her first being ill she was so well as to be turned to grass for one hour a day, and then two hours, increasing going out more daily, taking care, however, not to turn her out in wet and rainy weather. When any cows are taken ill, in order to prevent the rest of the herd receiving the distemper, it will be proper to follow this method—give each sound cow the quantity of two egg-shells of crude tar mixed in a little warm water, at the same time rubbing their noses and ears with tar, which probably may prevent the infection. If a cow should be taken violently bad, it may be proper to give her a quart of tar-water every hour till an alteration happens. The following is the method of making tar-water, but as the time taken up in making it is too long to be done after a cow is distempered, it is recommended that every person keeping cows should have as much by him ready made as he may have occasion for, according to the number of cows. Put a quart of plantation tar into a glazed jar, and pour four quarts of cold spring water on it, stirring it backwards and forwards well with a flat stick for the space of fifteen minutes, then stop it up close, and let it stand three days and nights to settle; afterwards skim the oil from the top of the water, and pour the water into bottles, letting them be well corked. Whether plantation or Stockholm tar is best is not determined, but plantation tar was used in the above case. The way to warm the tar-water is to put as much water in the saucepan as when boiling hot will serve to make the tar-water blood-warm, by pouring it on the hot water.

PLEURO-PNEUMONIA.—Mr. Paget, M.P., stated to the Council, that in the year 1853 he had reported to the Society the success which had attended his adoption of the plan of inoculating with matter, obtained from diseased lungs, those cattle in his dairy herd which were attacked by the pleuro-pneumonia. He was now again suffering from a visitation of the same malady, and he thought it due to the Society to state the grounds on which he had decided not to resort again to the same means as a safeguard from the attacks of that disease. His veterinary surgeon, Mr. Pyatt, who had so successfully resisted the disease in 1853, by inoculation, informed him in January last, when the disease again made its appearance in Mr. Paget's hovels, that he could not recommend him to resume the same inoculating plan, for that he had found a very high per centage of deaths resulting from its recent application. Mr. Paget consulted with Professor Simonds on the subject, who stated his belief that an inflammation, produced by a seton, dressed with irritating ointment, would be equally as efficacious as inoculation (supposing either of these means to have any efficacy), and that such was the opinion also

of some well-informed men who had investigated the disease on the Continent. Mr. Paget then requested Mr. Pyatt to try the seton in some of the hovels where the disease was most rife; and finding that it appeared to afford immunity from its attacks, he directed Mr. Pyatt to extend the practice to a considerable portion of the herd. The result had been so far encouraging. Previously to the application of this seton Mr. Paget had lost, out of his herd of from 90 to 100 head of stock, about three animals per week; but since the use of the seton he had been ten days without a single loss. He felt, however, that the trial at present had been of too short a duration to lead to any confirmed confidence in the practice, but that the preliminary employment of setons had, at any rate, given results of a very encouraging character; and if, as he feared, the disease was generally prevalent, he hoped that his bother farmers might also be induced to try that harmless safeguard on a part, at least, of their stock—on every other animal, for instance, in a hovel—in order that the farming community may arrive at some trustworthy conclusions on this important subject.

Communications were received from Lieut. Du Cane, R.E., on the injuries inflicted on the crops of every kind in Western Australia by swarms of locusts; from Mr. Bailey Denton, informing the members that his drainage works and experiments at Hinxworth would be open to their inspection on Saturday, the 2nd of May; from Mr. Scott, a grass-root, six and a half feet long, taken from a drain-pipe on the Frogmore House estate of three inches' internal diameter; and from Mr. West, expressing his satisfaction that the Society had renewed their prize for the best essay on microscopical investigations, and his intention to make the fact extensively known among the members of the Microscopical Society.

The Council adjourned to the 29th of April.

A WEEKLY COUNCIL was held on the 29th April; present: Mr. Henry Vyner (in the chair), Mr. Burgess, Mr. Collinson Hall, Rev. L. Vernon Harcourt, Mr. Key, Mr. Parkins, Mr. Pocock, Mr. Scott, and Professor Way.

The names of 41 candidates were announced for election at the next meeting.

AUSTRALIAN LOCUSTS.—Lieut. Du Cane, R.E., informed the Council, at the previous meeting, that "a portion of the colony of Western Australia had for some years been regularly visited, at the time the crops were rising, by swarms of locusts, which eat up everything green on the face of the country; attacking and utterly destroying the potato crops, the fruit-trees, vines, and in fact everything; that these locusts appeared to have become regular habitants of the colony, not making a sudden appearance and an equally sudden disappearance, as in some instances; and that they threatened to overspread the whole colony, for rivers did not, as might have been expected, stop their progress." The Council having referred that communication to Mr. Curtis, the highest entomological authority of this country, for the favour of his opinion, the following communication was received from him:—"I regret that I can give your

correspondent no satisfactory information regarding the destruction of locusts. Even if there were any remedies, it is doubtful whether they could be successfully employed, as in all probability the species of locusts in Australia differ very essentially in their economy from those of Europe. In my forthcoming report for the Journal, which I am happy to say is now completed, I have briefly alluded to the locusts of this country; and the only remedy appears to be the employment of poultry during the autumn and winter, which search for and feed upon the eggs of the grasshoppers." The Council voted their best thanks to Mr. Curtis for the favour of this communication.

AGRICULTURAL BOTANY.—The Council agreed to recommend that Professor Henfrey, of King's College, should be requested to deliver a lecture before the members in the Council-room of the Society, at 8 o'clock on the evening of Wednesday the 6th of May, on the "Nutrition of Plants," elucidating the organization and functions by which they derive and assimilate the nourishment obtained by them from various sources.

COMMUNICATIONS were received from Mr. Bullock Webster, on the arrangements in progress at Gnull Castle, in the vale of Neath, for the establishment of a Scientific and Practical College; and from Mr. Bailey Denton on his experiments at Hinxworth, in reference to the drainage of clay-soils.

Adjourned to May 6.

#### CATTLE MURRAIN.

The Earl of Clarendon has favoured the Society with the following communications:

Foreign Office, April 29, 1857.

Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the Council of the Royal Agricultural Society, a copy of a despatch from her Majesty's Minister at St. Petersburg, relative to the cattle disease.—I am, Sir, your most obedient humble servant,  
E. HAMMOND.  
J. Hudson, Esq.

St. Petersburg, April 18, 1857.

My Lord,—With reference to your lordship's despatch, No. 235, of the 8th inst., enclosing the Order in Council prohibiting the importation of cattle from Russian ports in the Baltic and Gulf of Finland, on account of the apprehended murrain, I have the honour to state that, as far as I can learn, the infectious disorder which prevails in this country amongst cattle is confined to Lithuania and the provinces bordering upon Poland. I am assured that it has never appeared in Finland, or in the northern and eastern parts of European Russia. I am, of course, unable to vouch for the accuracy of this information, but I certainly have never heard any mention of a murrain except in the provinces I have mentioned. A considerable quantity of hides which were about to be shipped to England will, I am told, be stopped by the prohibition. I have communicated a copy of the *Gazette* to M. Tolstoy, and have requested that steps may be taken to make the prohibition publicly known.—I have, &c.,

The Earl of Clarendon.

WODEHOUSE.

Foreign Office, April 30, 1857.

Sir,—I am directed by the Earl of Clarendon to transmit to you, to be laid before the President of the Royal Agricultural Society, a copy of an instruction which has been addressed by the Prussian government to their presidents of provinces, relative to the cattle disease.—I am, sir, your most obedient, humble servant,  
SHELBRURY.

The Secretary to the Royal Agricultural Society.

Sir,—In reply to your letter, dated yesterday, No. 2738, Chief Presidency, I beg most respectfully to inform you, that during the prevalence of the murrain, in the circuit of our administration, taught by experience to the contrary, gained in

the kingdom of Poland, we did not in any case attempt to separate numerous stocks of cattle of an infected district into smaller groups, and isolate them strictly from each other. We consider your view, viz., the immediate and energetic destruction of all cattle, having come even only indirectly in contact with the diseased, as the only safe means of ensuring a favourable result.

At the same time we beg to lay before you, in the annexed paper, a copy of the particulars, drawn up at the instance of the chief president of the province of Saxony, of the measures employed in our department to guard against, extirpate, and prevent the future extension of the pestilence.

Bromberg, July 28, 1856. Royal Government.

(Signed)

V. SCHLEINITZ.

To Baron Senft von Pilsach, Royal Chief President of the Province of Pomerania.

Sir,—In conformity with your letter of the 5th instant, No. 2389, Chief Presidency, we hasten to communicate the following particulars of the measures employed by us to guard against, extirpate, and prevent the murrain from extending to the circuit of our administration.

The exposure to danger to our department from the murrain has till now always solely proceeded from the adjacent state of Poland, upon which our three districts, Mowraclaw, Mogilus, and Guesen, immediately border. This geographical situation has for a series of years imposed upon us the obligation of keeping our boundary more or less closed, according to the directions of the various paragraphs of the law of March 27, 1836; and it has been but rarely possible, and then only for a short space of time, entirely to suspend the measures for closing the boundary.

In general the application of the directions in sections 2 and 3 of the above law sufficed for us; and only with the exception of the interval from 1831 to 1833, in which, in consequence of the Polish insurrection causing considerable distress in Poland, and also in consequence of the war, the pestilence crossed our frontier, and carried off about 870 head of neat cattle, which were partly destroyed by the contagion, and partly fell under the poleaxe, we were so lucky as to keep the department clear of disease.

It was in the month of March last year that we were obliged to order the frontier to be closed, which was first effected in pursuance of the directions in section 2 of the law of 1836, before mentioned. In October of the same year we were under the necessity, in consequence of the threatening approach of danger, of putting into force the severer directions of sec. 3, respecting the closing of the frontier; and when at the end of that month intelligence, though not officially confirmed, arrived here regarding the progress of the murrain, we caused the Polish district bordering upon our department to be thoroughly investigated, by the veterinary surgeon of our department, within a distance of three miles from the boundary of our territory. It being ascertained that the disease was only 2½ miles from our frontier, we determined, at the beginning of November of last year, to close the same still more strictly, according to sec. 4 of the said law. At the same time we ordered the district commissaries of police to inform the mayors of the different places of the impending calamity, who were not only instructed to exhort the inhabitants of their districts to use the greatest precaution, but also to give immediate notice, per express, to the counsellor of administration of the district of every suspicious case of disease breaking out among the cattle. As a warning and instruction to the public, we caused copies of the circular issued by the chief president of our province, dated 28th of January, 1845, to be printed and distributed, to which we annexed a description of the characteristics of the murrain, and caused the same to be distributed as a supplement to our official paper (*Gazette*). Besides this, we prohibited the attendance at the weekly markets of the towns lying nearest to the threatened boundary with those species of cattle, and persons and objects liable to infection, and which the law of 1833 specially enumerates; ordered establishments to be erected for personal purification in the villages wherein the frontier custom-office is, stationed gendarmes in the villages on our side of the boundary situated nearest the infected Polish districts, and charged the district commissaries in the immediate neighbourhood, under pain of dismissal from office, with the execution of the preventive measures in case the contagion should break out in our territory. We also empowered the counsellors of the administra-

tion of the district to order the district veterinary surgeons to inspect the villages and places on the boundary as often as necessity required, and to watch over the state of health of the cattle there.

When unfortunately, at last, towards the end of November, and beginning of December of last year, the murrain spread to our district of Mowraclaw, and soon after to that of Guesen, general measures were taken for closing the boundaries of the places infected, and special ones for the infected farmyards, by means of sentries posted under the superintendence of gendarmes; quarantine stables were established, superintendents and cattle inspectors appointed, and these persons provided with written instructions and bound by oath to their observance; all trade in cattle was forbidden within a circuit of three miles, all dogs chained up, and every proprietor of cattle within a circuit of two miles from the infected place was bound, upon pain of incurring the penalty of sec. 309 of the Criminal Law, to give immediate notice even of the least symptom of disease among his cattle to the mayor of the place, who had forthwith to inform the counsellor of the administration of the district, by an express messenger, of such cases of disease, provided they did not proceed from exterior injuries.

Regarding the killing of cattle in the infected places, we acted unrelentingly and strictly in accordance with the spirit of the accompanying copy of the ministerial rescript of 9th January, sent in reply to our report, interpreting sec. 38 of the patent, relative to the death of cattle of April 2, 1893, so that we ourselves, in one case in which we did not gain our object quickly enough by those measures, caused all the cattle of a whole district to be killed without hesitation, the approval of the minister being of course first obtained.

The murrain, threatening to extend itself in December of last year, and being ourselves convinced that strict measures for closing the boundaries, accompanied with judicious proceedings as regards disinfection, are the safest means of stopping the pestilence in its career, and being moreover of opinion that civilians alone are not adapted for the execution of such protective measures, we requested military assistance in order to establish a sanitary cordon, and we thus cut off all and every traffic communication with Poland. We instructed the counsellors of the administration of the infected districts to act as civil commissioners, in concert with the military commissaries, prohibited all intercourse by stage coaches with Poland, interdicted the holding of cattle markets in our three boundary districts, and issued the necessary warnings and threats of punishment to the public.

We moreover, in a few cases, employed the military for cutting off intercourse with the infected farmyards, as well as for the watching over the places of interment, which were laid out in pursuance of sections 57 and 58 of the patent relative to the death of cattle.

The measure for prevention and cutting off intercourse were never abandoned before the expiration of the fourth week, in the infected districts; the carcasses of the cattle that had died of murrain, or had been killed in consequence of its appearance in infected districts, no matter whether diseased or healthy, were always, after their skins had been cut into pieces on all parts of the body, buried in pits from six to eight feet deep, each carcass, however, being previously covered with unslacked lime.

After throwing open the boundaries of single districts, the directions in chapter 3, and especially in sections 123 to 129 inclusive, of the patent relative to the death of cattle, were most carefully followed.

In consequence of these measures we were so happy as to witness the complete extinction of the murrain at the beginning of this year; so that since the 3rd of January no further case of disease has happened in the circuit of our administration. The pestilence has cost the department 83 head of neat cattle in all; namely: 14 that died of it, 36 that were attacked with it, and 33 sound head of cattle destroyed.

After the extinction of the pestilence, we began to allow a gradual relaxation in the strictness of the measures concerning the intercourse with adjacent states. We opened first two, then two more, boundary custom-offices (the department has not several official points for crossing the frontier) to the traffic, with the following modalities: The custom offices are occupied by soldiers; home goods are allowed to be forwarded inland only through these offices, and must be passed there, after withdrawing the horses and vehicles, by the purchaser of

the goods as far as the boundary, nevertheless without a team, but must be entirely transported or carried by persons.

Individuals who can satisfy the officers of the urgency of their business or similar matters—which, however, must not be in connexion with cattle or cattle-offal—may, by reason of a certificate from the Counsellor of Administration of the district, cross the frontier, through the above offices, into Poland. Upon similar conditions, the foot-passenger, who must, however, be furnished only with the most necessary effects, is allowed to pass into our department from Poland; nevertheless, individuals crossing the frontier must, together with their effects, be disinfected in the establishments for disinfection erected at the boundary custom-place, under the superintendence of a gendarme. Spun goods are not allowed to enter Prussia.

Persons travelling post are likewise subject to the same regulations.

We have till now uninterrupted kept up the military cordon, as the murrain is not yet extinct in Poland; and we consider it indispensable to prevent, by every means in our power, the smuggling traffic, as well as every unlawful traffic, so favourable to the introduction of the pestilence, against which, independently of this measure, we employ the additional regulations of the police.

Relying upon the happy success obtained here, we cannot but consider that the strictest closing of the frontier, the most comprehensive disinfecting process, and the timely interference by killing the cattle threatening danger to the infected district, in the supposition that the public, being fully convinced of the magnitude of the danger, forthwith give information to the authorities of the least suspicious symptoms of disease among this species of animals, and that the latter, after immediate examination and proof, interfere vigorously, are the only means to be employed successfully against this terrible calamity as preventive and protective measures; and we recommend their adoption in the most urgent manner.

Bromberg, 9th July, 1856, Royal Government.

(Signed) V. SCHLEINITZ.

To Mr. Von Witzleben, Chief President of the Province of Saxony.

Extract from a despatch from the Consul-General at Hamburg, to the Earl of Clarendon:—

The *Hamburg Nachrichten* contains a statement to the effect that the Minister of Holstein has issued new regulations with reference to the pulmonary disease now prevailing among the horned cattle of that duchy. According to these regulations, all states, in which cases of pulmonary disease have occurred within the last six months, shall be closed, and no removal of cattle from such states is to be permitted. The cattle are to remain as much as possible in the same stalls, and only to be removed to the pasture grounds of the owners, which are to be fenced round to the exclusion of all other cattle, as it is deemed necessary to remove cattle from their infected stalls to purer air. The regulations also state, that strict attention is to be paid to cattle in the pasture grounds of the Nordlicher Aussendeich, and the Hohenkrug, near Nordfeld, as last year the disease in question first appeared there, and was spread further. The cattle from such pasture grounds for this reason shall not be removed without the consent of the authorities, and without they have been carefully inspected.

(Signed) G. LLOYD HODGES.

A MONTHLY COUNCIL was held on the 6th of May. Present: The Right Hon. THE SPEAKER, President, in the chair; Lord Berners, Lord Walsingham, Lord Bridport, Lord Feversham, Hon. A. Leslie Melville, Sir Charles Gould Morgan, Bart., Sir John V. B. Johnstone, Bart., M.P., Sir Archibald Keppel Macdonald, Bart., Mr. Dyke Acland, Mr. Alcock, M.P., Mr. Raymond Barker, Mr. Barnett, Mr. Hodgson Barrow, M.P., Mr. Barthropp, Mr. Bramston, M.P., Mr. Bullock, Mr. Cavendish, Colonel Challoner, Mr. Druce, Mr. Foley, M.P., Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Jonas, Mr.

Kinder, Mr. Lawrence, Mr. Miles, M.P., Mr. Milward, Mr. Pain (Mayor of Salisbury), Mr. Pope, Mr. Allen Ransome, Mr. Sillifant, Mr. Simpson, Mr. Thompson, Mr. Turner (Barton), Mr. Vyner, Mr. Jonas Webb, Mr. Burch Western, Mr. Sutton Western, M.P., and Mr. Wilson (Stowlangtoft).

His Grace the Duke of Rutland, of Belvoir Castle, Leicestershire, was elected a Governor of the Society.

The following new Members were elected:—

Barrington, Sir Matthew, Bart., Stephen's Green, Dublin  
Bott, William, Nantwich, Cheshire  
Bromet, William Rhodes, Cocksford, Tadcaster, Yorks  
Carver, William Rees, Tregadwan, St. Clear's, Carm.  
Cope, Robert, Hatherton, Nantwich, Cheshire  
Croft, Arthur Halton, Hutton-Buscal, Pickering, Yorkshire  
Crosbie, William Talbot, Ardfast Abbey, Tralee, Co. Kerry  
Cuthbert, Robert, Nearton-le-Willows, Bedale, Yorkshire  
Davenport, Edward, The Oakland, Tarporley, Cheshire  
Dawson, John, Blair Hill Mains, Culross, N.B.  
Dutton, Richard, Stanthorn Hall, Middlewich, Cheshire  
Eaton, Charles Ormston, Tixover Hall, Stamford, Linc.  
Eccles, Joseph, Mill-hill House, Blackburn, Lancashire  
Fowler, Benjamin, Whitefriars Street, London  
Gillett, William, Brize-Norton, Witney, Oxon.  
Godwin, William, Lugwardine, Hereford  
Gouldbourn, Joseph, Wilksley, Nantwich, Cheshire  
Hayes, Henry, Stamford, Lincolnshire  
Howden, Alexander, Capel Court, Ross, Herefordshire  
Hyett, John Edward, Haydon's Elm, Cheltenham  
Isaac, T. W. P., Terrace Walks, Bath  
Kennard, John Peirse, 4, Lombard-street, London  
Kerry, The Knight of, Valencia, Co. Kerry, Ireland  
Lysley, William John, Potter's Bar, Hertfordshire  
Marsh, John, Stratford-sub-Castle, Salisbury  
Marsh, Matthew H., M.P., Wilbury House, Salisbury  
Martin, Major James Murray, Sansaw Hall, Shrewsbury  
Moore, John, Kerry, Montgomeryshire  
Olding, Edmund, Ratfin Farm, Amsbury, Wilts  
Owen, Richard, Haughton, Tarporley, Cheshire  
Reynardson, Henry Birch, Adwell, Tetworth, Oxon.  
Richards, William, Newtown, Montgomeryshire  
Sharpe, Robert, Hewelsfield Court, Chestow, Mon.  
Shore, William, Sound, Nantwich, Cheshire  
Smith, William, Kettering, Northamptonshire  
Tombs, John King, Langford, Lechlade, Gloucestershire  
Vickers, Thomas, Ardwick Green, Manchester  
Walker, Elijah, Breerton, Sandbach, Cheshire  
Wyudham, Captain Alexander, West Lodge, Blandford, Dors.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the monthly report on the accounts of the Society, from which it appeared that the current cash-balance in the hands of the bankers was £1,087. He also laid on the table the various quarterly statements connected with the finance department.

COUNTRY MEETING of 1858.—Mr. Raymond Barker, Mr. Milward, Mr. Cavendish, and Mr. Brandreth Gibbs, as members of the Inspection Committee appointed at the previous monthly council to visit the localities in the North-Wales District proposed for the purposes of the country meeting of 1858, presented their report of that inspection, which was read. A deputation from the city of Chester was then received by the Council; consisting of Field-Marshal Viscount Combermere, Colonel the Hon. Douglas Pennant, Mr. Townshend Mainwaring, M.P., Mr. Salisbury, M.P., the Mayor and Town-Clerk of Chester, Mr. P. S. Humberston (deputy-chairman of the local society), Mr. Charles Townshend, Mr. Samuel Rowe, and Mr. Chivas (honorary secretary to the local committee). The de-

putation having invited the Council to hold the country meeting for the district of 1858 at Chester, and supplied information on the accommodation the city would afford for the purpose of that meeting, as well as having submitted a schedule of local prizes amounting to nearly £1,500, which they were prepared to offer in addition to the prize-list of the Society, retired. The Council then decided that a special committee, consisting of Mr. Miles, M.P., Colonel Challoner, Mr. Thompson, Mr. Hodgson Barrow, M.P., and Mr. Fisher Hobbs, should be requested to meet on that day week, for the purpose of taking into consideration the schedule of proposed local prizes so handsomely placed at the disposal of the Council by the deputation, and, if necessary, of conferring with the deputation on the subject. The Council then decided, on the motion of Lord Berners, seconded by Mr. Miles, M.P., that the country meeting of the Society for 1858 should be held at the city of Chester, on the condition that the Mayor enters into the usual agreement with the secretary of the Society. The deputation were then recalled, and informed of this decision; the Chairman thanking the deputation for the favour of their attendance, and expressing a hope that their noble efforts to improve the agriculture of their district, and thus advance the objects of the Society, would be followed as an example in other parts of the kingdom.

**DISTRICT FOR 1860.**—Mr. Alcock, M.P., Mr. R. Clutton, Mr. E. Stenning, and Mr. John Lees, Honorary Secretary, favoured the Council with their attendance, as a deputation to represent the peculiar claims possessed by Reigate as the place of the country meeting in 1860; situated, as it was, at a junction of railway lines connecting most completely the whole communication of the south-eastern counties; and prepared to carry out by the most ample means the objects of the Society. The districts for the intervening years having been already determined, the Council decided on the motion of Colonel Challoner, seconded by Mr. Milward, that the district for the country meeting of 1860 should comprise the counties of Kent and Surrey.

**CATTLE-MURRAIN.**—Communications on the cattle-murrain were received from the Earl of Clarendon, from Mr. Raymond Barker, Chairman of the Veterinary Committee, Prof. Spooner, of the Royal Veterinary College, Mr. Hall Maxwell, Secretary of the Highland and Agricultural Society of Scotland, and from Captain Croker, Secretary of the Royal Agricultural Improvement Society of Ireland. The following letter was read from Professor Simonds, the Veterinary Commissioner deputed to inquire into the nature of the cattle-murrain abroad by the three national agricultural societies of the United Kingdom:

“Cracow, April 30, 1857.

“My dear Sir,—I have delayed writing to you with a hope that I should be able to communicate that we were busily engaged in studying the nature and consequences of the ‘Rinderpest’ (contagious typhus of cattle). We have now passed into Galicia, having come by way of Holland, Westphalia, Hanover, Holstein, Hamburg, Lübeck, Mecklenburg, and Prussia, and this without meeting with a single case of the malady. We have met with disease in every State through which we have come, but on investigation it has proved to be nothing more

than pleuro-pneumonia. The severe measures which Prussia has adopted have kept back the malady (Rinderpest) from entering her kingdom, except a short distance from her frontiers on Austria and Russia, and the places where it had broken out are at this time entirely free from the affection. It is evident that the fear which has been excited in England has arisen from the incorrect statements of some of our Consuls, and especially with regard to the disease affecting the cattle in Holstein, Lübeck, and Mecklenburg. This has arisen also in some measure from the Governments of these places requiring infected cattle to be killed, and this on the breaking out of pleuro-pneumonia. Nor do these severe measures stop here; for if but few cases follow the first outbreak, then all the healthy animals which had been in contact with the diseased are killed. Full particulars of all the facts we have ascertained will presently be sent you, and we think that all fear of the Rinderpest entering England by the direct importation of diseased animals may cease to be entertained. Its indirect importation by hides, horns, hoofs, &c., is still a question requiring more examination before an opinion is given, and we have devoted much time to this inquiry. The information we were in possession of at the time of leaving England led us to suppose it would be necessary for us to make our way to Königsberg; but on arriving at Berlin we ascertained that it would be useless to go in that direction with a hope of falling in with ‘Rinderpest.’ Statements that the disease would be found in the neighbourhood of Breslau, and of the utter impossibility of our seeing the diseased cattle without undergoing ourselves a quarantine of three weeks within the circle of the military cordon, led me to seek an interview with Lord Augustus Loftus, her Majesty’s Chargé d’Affaires at Berlin, who received us most courteously, and not only put himself in communication at once with Baron Manteuffel, but also with Sir H. Seymour at Vicenza, so that now we are free to carry out our mission both in Prussia and Austria. In the former kingdom we find, through the local authorities, that, as I have before stated, no cases of the disease are now existing; still the cordon is not raised, and will not be for a week or two. This morning, being furnished with introductory letters forwarded to the Poste restante at Cracow by Sir H. Seymour, we have had an interview with Count Clam Martinitz, the Governor of the Province of Galicia, who has afforded us every facility, and pointed out the places distant from here about 100 miles where we shall meet with the disease. We start this evening, and shall only be able to go a few miles by rail, when we must make our way in the direction of Lemberg, in Austrian Galicia, as best we can. It is therefore for this reason, as it will be almost impossible for me to get a report of our proceedings to you from these out-of-the-way districts, that I write this letter, imperfect as it is, of our inquiry up to this time. I am, my dear sir, very truly yours,

“J. Hudson, Esq.”

“JAS. B. SIMONDS.”

Mr. Thompson, Chairman of the Journal Committee, reported the recommendation of the Committee, that as Prof. Simonds was at that time on the Continent collecting information on the subject of the murrain amongst cattle, he be requested to embody such information in a report, to be furnished to the Journal Committee immediately on his return to this country, in order that the three national societies may be prepared at once to take into consideration the best means of making it public.

**PRIZE ESSAYS.**—Mr. Thompson then reported, from the Journal Committee, the following adjudications:—

- I. WILLIAM BENNETT, of Regent-street, Cambridge: the Prize of Fifty Sovereigns for the best Report on the Farming of Bedfordshire.
- II. JOHN BAILEY DENTON, of Stevenage, Hertfordshire: the Prize of Ten Sovereigns for the best essay on the construction and maintenance of Farm-roads, with special reference to clay lands.
- III. ROBERT VALLENTINE, of Burcott Lodge, Leighton Buzzard: the prize of Ten Sovereigns for the best essay on the comparative advantages of sowing Beans in spring and autumn.

**AGRICULTURAL CHEMISTRY.**—Mr. Wren Hoskyns, chairman of the Chemical Committee, laid before the Council the annual report of Professor Way, the consulting chemist of the Society, which was ordered to be read at the ensuing weekly meeting.

**SALISBURY MEETING.**—Mr. Cavendish, Vice-chairman of the General Country Committee, reported the favourable progress of the works and arrangements for the Salisbury meeting. The entries for agricultural implements and machinery were announced to be unusually large; and Mr. Brandreth Gibbs was requested to order the requisite amount of shedding for their accommodation.

**IMPLEMENTS AT WORK.**—Colonel Challoner, Chairman of the Implement Committee, reported the following recommendation:

The want of means of showing the implements at work, belonging to the smaller exhibitors, who do not supply their own motive power, having been brought before the notice of the Society, Messrs. Clayton, Shuttleworth, and Co. have offered to furnish a shafting and pulleys about 100 feet long, as well as an engine to work the same, for £10 for this year; and the Committee recommend the above offer to be accepted. Should the Society find this arrangement answer, they will be at liberty to purchase the said shafting and pulleys for the sum of £50. The Committee further recommend that a proper shedding be erected at Salisbury for the above purpose.

The Council adopted this recommendation, and gave instructions accordingly.

**DYNAMOMETER.**—Colonel Challoner also reported the following recommendation from the Implement Committee:

In consequence of an application being made by Messrs. Howard, of Bedford, with the concurrence of Mr. Bentall, for them to copy the Plough Dynamometer, at present in use by the Society, and Mr. Amos, the consulting engineer of the Society consenting, the Committee recommend that Messrs. Howard's request be granted.

The Council adopted this recommendation, with an intimation that the concession thus made to Messrs. Howard would be granted to any other implement makers who might desire to avail themselves of the same advantage.

**GUANO.**—Communications were received from the Foreign Office, from H.M. Consul-General at Woahoo, reporting that H.M.S. *Havannah* had proceeded to examine Bird Island, but that no deposit of guano had been discovered.

The following letter, dated the 5th inst., was received from Messrs. Ord, Hudson, and Hayes, the lessees under Government of the Kooria Moorla Islands:

"In a paper read by Mr. J. C. Nesbit before the Royal Agricultural Society of England on the 22nd ult., respecting the deposits at the above-named islands, there are some inaccuracies which we are sure that gentleman will be happy to find corrected. The cargo per 'Colchester,' which proved of such inferior quality, we are assured by the owner, R. L. Bolton, Esq., of Liverpool, was not obtained from these islands, but from an island in the Red Sea. The vessel was at that time commanded by Captain Withers, who some two or three weeks ago called upon us previous to sailing for the Kooria Moorla Islands, in the 'Virginia,' and in the course of conversation said that the cargo in question was taken from 'Burnt Island,' situated some thousand miles from Kooria Moorla. We question very much if any of the samples analyzed by Mr. Nesbit were taken from the islands of which we are the lessees. Of course, as at Ichaboe, and even the Chinchas, there will be a difference in quality, particularly near the shore,

where there will be less ammonia and more silica mixed with the deposit than at a greater elevation and more inland. During nine months of the year no rain falls in that neighbourhood, and in the other three there are only slight showers occasionally. But it is idle to enter into a discussion on this matter when in the course of a few months the question of quality will be decided by the arrival of several cargoes here. The engagement of Government to station an armed vessel at the islands for the protection of the shipping resorting there and maintenance of order, has induced all classes of ship-owners to engage in this enterprise with considerable spirit. A large number of vessels are already on the way out to load there, and many more are about to follow. Practical chemists will be engaged to proceed out, in order to select the most valuable deposits for shipment, and Captain Ord also will be there to render all the assistance in his power. We are assured by parties not connected with Captain Ord, who have visited the islands recently, that there is among the deposits a large quantity closely resembling and second only to Peruvian in quality; should this information be correct, of which we have little doubt, this discovery will prove a greater boon to both the agricultural and shipping interests than was at first believed. We are informed by the Admiralty that H.M. screw steam-ship 'Cordelia,' Commander Vernon, is under orders to proceed to this station for the purpose of regulating and protecting the trade, and will be despatched immediately."

**HOUSE-LIST.**—Agreeably with the Bye-Laws, the Council arranged, by ballot, an election-list, to be recommended by them for adoption at the ensuing General Meeting.

**LECTURE.**—In the evening, Professor Henfrey, of King's College, London, favoured the Society with an interesting and instructive lecture on the subject of the nutrition of plants, elucidating the organization and functions by which they derive and assimilate the nutriment obtained by them from various sources. The lecture was illustrated by eleven diagrams, distinctly drawn on a large scale and beautifully coloured, showing the different characters of the cells composing different plants, and their changes according to the nature and growth of particular vegetables. Mr. Fisher Hobbs, as chairman of the meeting, conveyed his own thanks and those of the other members present, for the service Professor Henfrey had rendered to the Society in favouring them with that lecture, which he hoped to see reduced into the form of a distinct paper for publication in the Journal.

A WEEKLY COUNCIL was held on the 13th of May; present: Mr. MILES, M.P., Vice-President (in the chair), Earl of Powis, Lord Bridport, Lord Walsingham, Hon. A. Leslie Melville, Hon. John Jervis Carnegie, Mr. Alcock, M.P., Mr. Aytown, Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Berners, Mr. Champion, Mr. Cavendish, Colonel Challoner, Mr. A. E. Fuller, Mr. Goold, Rev. L. Vernon Harcourt, Mr. Scott Hayward, Mr. Fisher Hobbs, Mr. Jonas, Mr. Majendie, Mr. Mundy, M. Naveau (of Liège), Mr. Paget, M.P. Mr. Pain (Mayor of Salisbury), Mr. Pickin, Mr. Pocock, Mr. Savinon, Mr. Scott, Mr. Slaney, M.P., Mr. Vyner, Mr. Bullock Webster, Mr. Burch Western, Mr. Wilson (of Stowlangtoft), Mr. F. Maitland Wilson, and Mr. George Wood.

Communications were received from Mr. Garnett, M.P., and Mr. Hemming, on the successful trials recently made with Boydell's Traction Engine and Endless Railway in Norfolk; from Lieut. Du Cane, R.E., on



Locusts in America and at the Cape of Good Hope; and from the Foreign Office on the progress of Cattle Disease abroad.—Professor Way's Annual Report, as consulting-chemist to the Society, was read.—Mr. Paget, M.P., expressed his fears that the plan of Setoning he had adopted as a preventive against pleuro-pneumonia in his dairy-herd would not be found to realize the expectations which he had been led to form of its influences during the early period of its trial: and a discussion took place on the value of data possessed by Cattle Insurance Companies in reference to the conditions of disease among the live-stock of farmers.

WEEKLY COUNCIL, May 20.—Colonel CHALLONER, Trustee, in the Chair.

CATTLE MURRAIN.—Mr. Raymond Barker, Chairman of the Veterinary Committee, read the following communication:—

“Cracow, May 13, 1857.

“My dear Sir,—I have now the pleasure of informing you that, through the interest taken in the subject of my inquiry by Her Majesty's Ambassadors both at Berlin and Vienna, and their kind interference on my behalf, of which I gave you the particulars in my last communication, every facility has been afforded me by the Austrian authorities throughout Poland to investigate the cattle pest; and that although we have had to travel a far wider extent of country in search of the malady than we had anticipated, we have nevertheless not only succeeded in meeting with it, but in studying its nature and effects. It was not until we reached the Carpathian mountains that we came up with the disease, as it had subsided already in every place we passed through, and chiefly in consequence of the rigorous measures which are promptly adopted to stay its ravages, by killing not only the infected cattle, but also those which they had been in contact with. We arrived at a village named Lukowica the day after a slaughtering had taken place, which forced us onwards to another named Zabrez, where we found some animals in quarantine, and in the adjoining parish of Hamienico, but distant five miles from us, another quarantine station had been established. Here we determined to halt and watch the course of events, and joining the Austrian Commission in their next journey to camp quarters we daily visited the stations. Within two days a case occurred, and I arranged to purchase the animal for investigation to save its being at once killed. A second case I dealt with in the same way, and as this was followed by other cases very quickly, by the deaths of some animals and the killing of others in various stages of the malady, we have had a far better opportunity of carrying out our mission than was to be anticipated. We have stayed as long as an animal was left in the quarantine stations, more having come in while we were there; and under these circumstances we are now on our way back. I hope soon to reach England, and to lay an entire report before the Society, which I will not anticipate by adding to this letter. I may, however, say that I believe no fears need be entertained at home that this cattle pest will reach our shores.—I am, &c.,

“Jas. Hudson, Esq.”

“JAS. B. SIMONDS.

#### THE HALF-YEARLY MEETING.

The half-yearly meeting of the members was held on Friday, May 22, in Hanover Square; when Mr. W. Miles, M.P., one of the Vice-presidents, took the Chair at 12 o'clock. The attendance was unusually large, and included the following:—Lord Berners, Lord Walsingham, Lord Feversham, Lord Bridport, Sir J. V. Shelley, Bart., M.P., Sir W. W. Wynn, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Sir E. Halse, Sir A. Macdonald, Mr. Barrow, M.P., Mr. Caird,

M.P., Mr. Foley, M.P., Mr. R. Barker, Mr. Barthropp, Mr. W. F. Hobbs, Col. Wood, Col. Challoner, Col. Roland, the Rev. C. T. James, Mr. Robert Smith, Mr. Samuel Jonas, Mr. Pain (Mayor of Salisbury), Mr. B. Webster, Mr. A. Hamond, Mr. Wren Hoskyns, Mr. B. Gibbs, Mr. R. Milward, Mr. Druce, Mr. Corbet, Mr. J. C. Morton, Mr. Lockhart Morton, Mr. Scott, Mr. G. E. Frere.

The Chairman commenced the proceedings by referring to a letter which had been received from the President, the Right Hon. E. B. Denison, Speaker of the House of Commons, expressing regret that the necessity of his being present at a meeting of the Library Committee of the House at noon rendered it impossible for him to take the Chair.

The Secretary, Mr. Hudson, having read the laws relating to elections,

The CHAIRMAN observed that the first business was the election of a President for the year ensuing the rising of the Salisbury meeting.

Mr. BARROW, M.P., said it was with some reluctance, on account of his being so uninfluential a member of the society, that he rose to propose the name of a President for the ensuing year; but he believed the want of influence which attached to himself in that position would be amply compensated for when he mentioned the nobleman whom he was about to propose—a nobleman who was so well known to every member of the society as a most anxious supporter and promoter of agriculture, in every possible mode, and as having devoted much of his time and influence to the cause of agriculture that he could not anticipate any hesitation on the part of the meeting in selecting him as the President for the ensuing year. He begged to propose Lord Berners. (Cheers).

Mr. R. MILWARD felt great pleasure in seconding the motion. It would ill become him to take up the time of the meeting by adding anything to what was said by the mover, in favour of that nomination; and he would therefore confine himself to the seconding of the motion.

No other name having been proposed,

The CHAIRMAN declared Lord Berners elected to fill the office of President for the ensuing year.

Sir JOHN JOHNSTONE, M.P., proposed the re-election of the Trustees, remarking that it would be impossible to make a better selection.

Mr. W. ASHURY seconded the motion, which was agreed to.

On the motion of Sir W. W. WYNN, the vice-presidents were also re-elected without any opposition.

The meeting then proceeded to the election, or re-election, of the members of the Council, the list submitted, comprising the following new names:—Mr. H. B. Caldwell, Viscount Eversley, Mr. J. Howard, Mr. S. Mills, Mr. J. B. Stanhope, M.P., and Mr. W. Torr. After a few minutes, the scrutineers announced that the house list had been adopted by the meeting.

Mr. HUDSON, the Secretary, then read the report of the Council, which was as follows:—

## REPORT.

The Society consists at the present time of—

83	Life Governors,
137	Annual Governors,
896	Life Members,
3933	Annual Members, and
19	Honorary Members,

making a total of 5068, or an increase of 89 names on the list of the Society since the last anniversary meeting.

During the past half-year the Society has lost by death two of its earliest members, the Duke of Rutland, a trustee, and Mr. Francis Woodward, one of the general Members of Council, each, within his respective sphere, distinguished for his devotion to agriculture, and for promoting the welfare of all connected with its pursuit. The Council have supplied the vacancies consequent on their decease, by the election of Mr. Bramston, M.P., as a Trustee, and of Mr. Pain, Mayor of Salisbury, and Mr. Paget, M.P., as general Members of the Council.

The invested capital of the Society stands at £9,264 8s. 11d. stock in the New Three per Cents, and the current cash-balance in the hands of the Bankers on the 1st instant was £1,087.

The Consulting Chemist of the Society is engaged in investigations on the solubility of substances in the soil supplying nourishment to plants. He has also delivered a lecture before the members on the general character and geographical distribution of guano deposits, and has made his annual report on the details connected with his department. The Council have been favoured by Professor Henfrey, of King's College, with a lecture delivered before the members, on the nutrition of plants, elucidating the organization and functions by which they derive and assimilate the nutriment obtained by them from various sources.

The Council have again to record their sense of the Earl of Clarendon's interest in promoting the objects of the Society, by obtaining from the Ministers and Consuls abroad not only information on the occurrence of guano and other manuring substances, but also details connected with the progress of pleuro-pneumonia and contagious typhus among the cattle in different parts of Europe. The Council having received from the Royal Agricultural Improvement Society of Ireland a suggestion that it would be desirable for the three Agricultural Societies of the United Kingdom to unite in the common object of despatching abroad a special Veterinary Inspector, for the purpose of ascertaining the exact nature of the contagious typhus, they at once concurred with the Highland and Agricultural Society of Scotland in adopting that suggestion, and on the 9th of last month Professor Simonds, furnished with a circular letter from the Earl of Clarendon to the several Consuls of Europe, left England as the Veterinary Inspector of the three National Societies, and on the 30th forwarded his first communication, in which he reports that he found, to a great extent, that the pleuro-pneumonia had been mistaken for the severer malady of contagious typhus; and that he had to penetrate into Poland itself in order to meet with cases that might furnish evidences for his study and report. He expresses his firm opinion that there is, at present, no fear of the contagious typhus being introduced into this country by means of living animals, whatever danger may arise from the importation of hides or other integumentary portions of slaughtered cattle. Copies of this communication were at once forwarded to the Foreign Office, and to the Highland and Agricultural Society of Scotland and the Royal Agricultural Improvement Society of Ireland.

The arrangements for the Salisbury Meeting, to be held in the third week of July, are proceeding satisfactorily. A very large entry is already made of implements; and the entries for stock, which close on the 1st of next month, promise to be equally numerous. The implements at work will this year be presented under a new arrangement, which will essentially tend to increase the interest of that part of the Show.

The Council have decided, subject to the usual conditions, to hold the Society's Country Meeting of next year at Chester; and have determined the district for the year 1860 to be comprised of the counties of Kent and Surrey.

While the Chelmsford Meeting of last year was one of the most successful meetings hitherto held in promoting the

objects of the Society, it also proved in its results to have been one of the most expensive in a financial point of view; and the Council have under their consideration the adoption of various modifications which may tend to reduce the expenditure of future country meetings, while their full efficiency is in every respect essentially maintained.

The steady increase of permanent Members on the list of the Society, the great interest felt in various districts of the kingdom respecting the practical value of its country meetings, and the gradual union of the owners and occupiers of land, who are thus brought into communication with each other, and led to co-operate in the common object of promoting their individual interests, while advancing at the same time the general cultivation of the country and the principles of rational agriculture throughout the world, are circumstances which furnish well grounded hopes of the beneficial influence of the Society's operations, and a just expectation of its continued and increasing usefulness.

By order of the Council,

JAMES HUDSON, Secretary.

London, May, 1857.

Col. WOOD proposed the adoption of the report.

Sir E. HULSE seconded the motion.

Mr. W. F. HOBBS said he was not present at the special meeting of the Council at which the report was agreed to, and he felt it his duty, as an Essex man, and as having taken a great interest in the Chelmsford Meeting, to explain the paragraph which referred to the meeting of last year. A report had gone abroad that the Chelmsford Meeting was very ruinous to the Society. That was in consequence of the finance account placing the amount of premiums for stock and implements against the receipts of the yard, whereas the premiums had in former years come out of the income of the Society. It was stated in the report that the expense of the Chelmsford Meeting was very heavy; but if the members of the Society examined the matter, they would find that the loss incurred at the Lewes Meeting, and at other meetings in former years, are greater than that incurred at Chelmsford. There was an erroneous opinion abroad—and the Council had been rather condemned in consequence of this notion—that the Chelmsford Meeting was a great loss to the Society. This was, he repeated, attributable to the circumstance that in the account issued by the Finance Committee the amount of the premiums for implements and cattle are deducted from the amount of the receipts of the show-yard. As the Society had an income of about £5,000 a-year, it might fairly be expected, and could well afford, to provide, as it had previously done, the amount of the premiums at the show. Although the Railway Company did not afford such accommodation as was expected, and although the receipts were not so good as he could have wished, yet, on the whole, he regarded the Chelmsford meeting as a satisfactory one for the Society.

The report was then adopted.

The CHAIRMAN observed that since the meeting did Lord Berners the honour of electing him as president for the ensuing year, his Lordship had entered the room, and he had now great pleasure in announcing to him that he had been chosen for that office. He believed that no one had attended more regularly to the duties which devolved upon him than Lord Berners; the prominent part which he had taken in the drainage of the country showed that he was a scientific agriculturist

as well as—what all knew him to be—a practical farmer. He had, therefore, great pleasure in informing Lord Berners that before he came into the room he was unanimously elected the president for the ensuing year (cheers).

Lord BERNERS said he could assure the meeting that he esteemed his election to the office of president one of the highest compliments that could possibly have been paid to him. From the very formation of that society it had been his desire, and so far as he had means it had been his endeavour, to carry out its objects; and he could assure them that his exertions on behalf of the society would be greatly increased by his having had such an honour conferred upon him—an honour which was enhanced by the circumstance that the meeting at Chester might fairly be expected to be one of the largest meetings of the Society; no county, perhaps, having contributed more nobly to the advancement of agriculture.

Mr. R. BARKER said, before presenting the half-yearly account, he begged to observe that since the report was drawn-up a further communication had been received from Professor Simonds, from which it appeared that he had obtained all the information which he sought for, in the vicinity of the Carpathian mountains, with regard to the cattle murrain; and the result of his investigation would no doubt soon be laid before the members of the society. Mr. Barker then presented the following balance-sheet:—

HALF-YEARLY ACCOUNT FROM THE 1ST OF JULY TO THE 31ST OF DECEMBER, 1856.

*Receipts during the half-year.*

	£	s.	d.
Balance in the hands of the Bankers, July 1, 1856.....	3299	12	2
Petty Cash Balance in the hands of the Secretary, July 1, 1856.....	22	15	5
Dividends on Stock.....	129	14	1
Governors' Annual Subscriptions.....	15	0	0
Members' Life-Compositions.....	230	0	0
Members' Annual Subscriptions.....	585	1	0
Journal Receipts.....	148	16	4
Country Meeting Receipts:—			
Chelmsford.....	3261	11	8
	£7692	10	8

(Signed) THOMAS RAYMOND BARKER, } Finance Com-  
   Chairman, } mittee.  
   C. B. CHALLONER, }  
   T. W. BRAMSTON, } Trustee.

*Payments during the half-year.*

	£	s.	d.
Permanent Charges.....	173	0	0
Taxes and Rates.....	19	9	0
Establishment Charges*.....	978	2	9
Postage and Carriage.....	15	15	1
Journal Payments.....	643	19	9
Essay Prizes.....	40	0	0
Chemical Grant.....	150	0	0
Country Meeting Payments:—			
Chelmsford.....	5212	15	8
Sundry items of Petty Cash.....	3	14	1
Balance in the hands of the Bankers, Dec. 31, 1856.....	438	12	8
Petty Cash Balance in the hands of the Secretary, Dec. 31, 1856.....	17	1	8
	£7692	10	8

\* Under this head is included the sum of £500 paid on account of repairs required in the house of the Society.

Examined, audited, and found correct, the 15th of May, 1857.  
 (Signed) GEORGE I. RAYMOND BARKER, } Auditors on  
   GEORGE DYER, } the part of  
   WILLIAM ASTBURY, } the Society.

Mr. W. F. HOBBS observed that in the amount just presented the receipts of the Chelmsford Meeting were stated to have amounted to £3,261, and the payments to £3,212. He hoped it would not go abroad that that was the real state of the case, as £1,200 was received independently of what was mentioned.

Mr. BARKER said, the statement presented was a statement of the Society's accounts for the half year.

Mr. HOBBS only wished to point out that it was not a completed debtor and creditor account as regarded the Chelmsford Meeting.

Mr. BARKER remarked that that would be obtained when the amounts of the two half-years were put together.

Mr. HOBBS said, as the amount stood the Chelmsford Meeting appeared to have involved a great loss, but that was not the case. The account did not show the balance of the receipts and the expenditure at Chelmsford.

The CHAIRMAN: Oh, no; it is only the half-year's account.

On the motion of Lord Berners, thanks were voted to the auditors—Mr. G. R. Barker, Mr. Dyer, and Mr. Astbury—for their services.

Mr. W. ASTBURY, in returning thanks, said the auditors had every facility afforded to them by Mr. Hudson in the discharge of their duties; and so excellent was the system of accounts adopted by the Finance Committee, that their task was, in fact, a very easy one.

The CHAIRMAN said, the formal business having been disposed of, he wished to know whether any Member had any suggestion to make, which he desired to have reported to the Council. It had been remarked elsewhere that the Society might be much improved; and, as that was the proper time for suggesting improvements, he hoped the opportunity would not be lost. He was confident that any suggestions of a useful character would be taken into careful consideration by the Council.

Mr. FRERE said he would call the attention of the Council to what he conceived to be one of the wants of the Society. The report mentioned a lecture delivered by Mr. Henfrey as having been of great advantage to the Society. Though the Society had an honorary Professor of Veterinary Surgery, and honorary professors of several other branches of science, it had no honorary Professor of Botany; and, considering that there were such men as Hooker, Lindley, and Henfrey available, it appeared to him very extraordinary that the first agricultural society in the three kingdoms should have no one to whom it could refer when it wished for information with regard to the habits of a weed, or with regard to varieties in the formation of a flower, or with regard to the fruit of a plant. He would therefore suggest to the Council the necessity of the Society's having a consulting botanist, who might, as the occasion arose, be consulted in such matters.

The CHAIRMAN observed that at the period of the

early history of the Society its publications contained a good deal of matter relating to the weeds which infest corn crops, and the habits of weeds in general. He questioned whether the appointment of a professor of botany would now confer any great advantage on the Society. While they had a veterinary professor and a chemical professor, the Council had not been unmindful of botany. The contents of the Society's Journal were interspersed with papers on botanical subjects, and the committee who conducted the Journal would, he was sure, be delighted if Mr. Frere or any other gentleman would communicate to them the result of any botanical investigations which were at all likely to be serviceable to agriculture.

The Rev. T. C. JAMES said, as they were met there not to offer compliments, but to endeavour to promote the interests of the Society, he must congratulate the meeting on the infusion of new blood into the Council—a step which he believed would be gratifying to the members at large, and conducive to the benefit of agriculture (Hear, hear). With regard to the judges, he must express a hope that they would not again hear of the same gentlemen acting as judges both of short-wools and of long-wools—of cart-horses and thorough-bred horses. One of the public newspapers once said of the Society that it was not advancing, either in numbers, in wealth, or in intelligence; and that it was altogether in a torpid state. As regarded numbers, he was happy to find that it was now in an improved position, and he trusted that such would be the activity and energy of its managers and members, that it would rapidly increase in intelligence and in practical usefulness.

Lord BERNERS begged to propose that the best thanks of the meeting be given to Mr. Miles, for his conduct in the chair.

Mr. HOBBS said, before that motion was put, there was a most important subject relating to the next meeting to be brought forward, he believed, by the Mayor of Salisbury; or, if that gentleman declined to introduce it, he should be happy to do so himself.

Mr. PAIN, Mayor of Salisbury, said he wished to suggest that the prize-list for the stock at the Salisbury Meeting should be advertised immediately in the three agricultural papers, and that placards announcing the meeting itself should be posted at the different railway stations in the district. For the last two or three weeks, he had had almost daily inquiries from the farmers in the vicinity of Salisbury, as to when the prize-list would be published. Mr. Hudson had kindly forwarded to him several prize-lists to distribute, and he had disposed of them in that manner; but there were other districts in which there was no one to take upon himself that office, and he thought the interest of the Society required that the list should be widely diffused. He had no wish to speak with anything like disrespect of farmers; but they all knew how quiet and easy they were in reference to such matters (laughter), and how apt they were to put off everything till the last moment. Hence the necessity of reminding them, by the publication of the prize-list, that the 1st of June was the last day for making entries. He should take an early

opportunity of moving in the Council that, next year, the prize-list should be circulated at as early a period as was practicable. It should be recollected that the prize-lists issued from that place did not reach farmers who were not members; and he was anxious that it should go forth to the agricultural community generally that there was to be a meeting at Salisbury, and that certain classes of animals would be exhibited.

Mr. W. F. HOBBS entirely concurred in the remark of Mr. Pain as to the importance of making it generally known as early as possible that no animals could be entered for exhibition after the 1st of June. Many gentlemen might not be aware that a serious loss occurred at Chelmsford in consequence of very few days being allowed to intending exhibitors to produce their certificates, and he thought in future there ought to be great exertions made to ensure early and extensive publicity. Last year, and in the previous one, long before the Exhibition at Paris, there were placards and advertisements, and lists of prizes, circulated about the continent and in England respecting the approaching show; and he thought that example was worthy of imitation. Last autumn an arrangement was made in the Council that the prize list should be prepared early enough to appear in the *Journal* on the 1st of January, but that arrangement was not carried out. He trusted that the suggestion now made by Mr. Pain would be adopted by the Council, and that everything that was practicable would be done to ensure the requisite publicity. As regarded placards, he himself offered, last year, to pay a portion of the expense of letting the public know when, and where, the meeting was to take place. He believed that at the Windsor Meeting a very serious loss was incurred in consequence of the inhabitants of the metropolis not having been duly informed. He felt warmly on this subject, and had felt it his duty to bring it before the meeting. It was not to be expected that, in a Council consisting of fifty members, there should be no difference of opinion.

Mr. R. BARKER did not agree with Mr. Hobbs that the Windsor Meeting suffered for want of publicity.

Sir J. SHELLEY, M.P., said, though he admitted that the subject introduced by Mr. Pain was worthy of consideration, he must say he thought it would have been better to bring it before the Council than to introduce it before a general meeting of members. In such matters as these the Council were bound to pay some attention to the question of expense; and advertising at railway-stations could not take place without a large outlay. The great object of the Council was to make the Society popular with the members, and at the same time to show the public that, by becoming members, they would secure advantages which they could not otherwise possess (Hear, hear). The question for the Council was how they could spend the money of the Society with the greatest advantage to the Society itself. He must protest against the notion that there was any desire on their part to prevent the utmost publicity with regard to the meetings. Having been a member of the Council for many years, he had never seen anything that evinced a desire to crush publicity, if he might use such an ex-

pression, with regard to the prize-lists; and he believed it was the desire of all to render the meeting as popular as possible, though they must, at the same time, take into account the question of expense.

Mr. PAIN said he had always understood that in such matters advertisements paid for themselves; and as to the expense of publicity at railway stations, there was no railway company in the kingdom that would not gladly allow placards to be exhibited for such a purpose.

Mr. W. F. HOBBS felt bound to say, in allusion to the remarks of the hon. Baronet who had just spoken (Sir J. Shelley), that in November last he (Mr. Hobbs) proposed to the Council that the prize-sheet should be arranged early, in order that it might appear in the Journal on the 1st of January. He made that proposal in consequence of what occurred at the Chelmsford Meeting, and he trusted that in future it would always be published at that period.

Mr. A. DIAMOND did not think there could be much difficulty in the case. Everyone knew the Derby Day, and if he had got a horse that was likely to win, he would take care to enter him for the race. In like manner, anyone who had a good animal to exhibit, would take care to place him where he was most likely to win (Hear, hear).

Mr. HUDSON, the Secretary, said that advertisements had been sent to a great number of newspapers in the West of England, stating that prize-sheets could be had on application to himself. He was happy to be able to add that the applications in the case of implements were as numerous as on any previous occasion, and that in the case of stock they were in such abundance every morning, that it was almost impossible to answer them.

The subject then dropped, and

Lord BERNERS, after expressing his gratification at the interest which had been manifested in it, renewed his motion for a vote of thanks to the Chairman, observing that the hon. gentleman had on many occasions contributed greatly to the prosperity of the Society.

Sir J. SHELLEY, in seconding the motion, said his hon. friend had acted with himself on many occasions in the show-yard, and had always evinced the greatest anxiety for the welfare of the Society.

The motion having been put by Lord Berners, and carried by acclamation,

The CHAIRMAN said, he regretted exceedingly that the Speaker of the House of Commons was, owing to circumstances over which he had no control, unable to be present on that occasion; and he was sure that, had the right hon. gentleman been present, he would not only have returned thanks for the kindness evinced towards him during the time that he had filled the office of President, but would also have expressed his regret at the impossibility of his being present at the approaching meeting at Salisbury. Though that was not the proper time for returning thanks to the President for his services, he trusted that he might be allowed to address a letter to him, stating how deeply the Society regretted that he could not now take part in their proceedings, and at the same time alluding to the benefit which he had conferred on the agriculture both of this country, and of France (Hear, hear). Mr. Denison was the chief instrument in obtaining an alleviation of the French tariff with regard to the importation of agricultural implements which was made some months ago, and the consequence of which had been the introduction of many of our best implements into that country—a result which, while it must be very beneficial to the agriculture of France, which stood greatly in need of such an importation, must be profitable to those implement-makers to whom that Society, and agriculturists generally, were so much indebted. He had to congratulate the meeting on a fact which had been announced at that meeting, namely, an increase of numbers; and, notwithstanding some gloomy reports which he had seen in the newspapers and elsewhere, that instead of progressing the Society was rather retrograding, he thought the list of Members showed that it stood well in public estimation (cheers). For himself he could declare that it always afforded him the greatest pleasure to take part in the proceedings. He had been connected with the Society from the commencement, and, as Sir John Shelley had intimated, he once took an active part in connection with the implements exhibited in the show-yard. That time had now passed away. He had, however, since received the greatest honour that could be conferred on him as an agriculturist—that of being elected President of the Society; and regretting that the President of the year was not there to speak for himself, he begged, on behalf of that gentleman and himself, to return thanks for the honour which had been done them (cheers).

The meeting then separated.

## IMPORTANT SALES OF SHORT-HORN STOCK.

### MR. GRENFELL'S HERD, AND A DRAFT FROM MR. BOLDEN'S.

By MR. STRAFFORD, AT DUDDING HILL.

Thursday, May 21, witnessed the far-famed Dudding Hill Farm under a totally new phase. Its rich horse recollections of Harkaway, Peep-o'-day Boy, Epirus, Tear-away, Pit-ford, The Libel, Hermit, and Ethelbert, with Lottery, Duenna, and countless ex-steepchasers, are fast passing away; and Vulcan and Chabron are the

only blood stock left. Shorthorns are now, in their turn, in the ascendant, and we trust that the present sales may prove the forerunners of many equally successful ones to come. Great changes have taken place on the premises since the Messrs. Halls' day. The unsightly pond is filled up, and the main avenue is re-

lived of that row of boxes which Cleveland Shortlegs, &c., were wont to tenant, thus adding not a little to the *tout ensemble* which greets the stranger as he enters the yard. The farm lies at a distance of two miles from the Kilburn and one from the Willesden stations; and the approach down a rural lane past Bransbury Park, late the seat of Lady Salisbury, might well tempt a visitor into the belief that he was fifty miles away, instead of five, from the very heart of the mighty Babel. It is admirably adapted for the purposes to which Mr. Strafford proposes to put it; and Grand Turk was the first of the temporary shorthorn visitors who have stood there waiting for embarkation. Many were the inquiries for this renowned bull on Thursday, but his six weeks' stay had expired on the Tuesday previous; and he was already housed on the deck of the "Washington" steamer, and *en route* to Mr. Thorne, of New York.

The threatening appearance of the morning, up till nearly one o'clock, frightened a few away; but long before the sale commenced there was a very fair muster, amounting to perhaps 300, and amongst them we noticed the Duke of Montrose, Earl Lucan, Lord Feversham, Viscount Emlyn, &c. A very handsome lunch was provided in a large marquee by Mr. Carr, of the King's Head, 265, Strand; and when the various dainties had been discussed, and the occupants of the boxes had been well looked over, an adjournment was made to "The Ring." It is a permanent structure, and was used in Messrs. Halls' time for lounging young stock, but seems as if "to the purpose made" for which it is to be used in future. The inner ring was marked out with hurdles; and Mr. Strafford's rostrum was erected under a large wooden covering, whither the buyers made a precipitate retreat during the showers.

Mr. Grenfell's herd is principally derived from Lord Ducie's, Sir Charles Knightley's, and Messrs. Tanqueray and H. Combe's. The Bates' blood is very predominant in it, and many of the cows were closely allied to the Bampton Rose tribe, to which the renowned Master Butterfly belongs. It is worthy of remark that all the females of this tribe, excepting Pomp, which were offered for sale by Mr. Strafford during the week, both in Wales and at Dudding Hill, were purchased by Col. Towneley's agent, Mr. Eastwood. The above cow was the first on the list, and fetched 50 guineas, which was bid by the agent of a lady from the neighbourhood of Settle. Beatrice, the dam of the heifer Bettine, who took the second Chelmsford prize last year to Mr. Booth's Queen of May (whom, as Mr. Strafford hinted, "1,000 guineas would not buy") was put in at 40 guineas, and finished at 90 guineas. She is out of Lord Ducie's favourite Bessy, by Helicon, and half-sister to Baltic, who was lately purchased for the French Government. Helen, who displayed an udder of no ordinary dimensions, then went for 63 guineas; and Darlington, whose sister was sold as a heifer for 300 guineas to Mr. Thorne last year, for 76 guineas to Mr. Peel. In consequence of Parliament having had two dead calves, the bidders were not "fond," and no advance could be got on 37 guineas; albeit her sire, the 4th Duke of York, was sold for 500

guineas as an old bull, and was the sire of a 1,000-guinea one. Pride also fetched only 100 guineas, or 55 guineas below what had been given for her as a calf at Lord Ducie's sale; but Lizzy, a worthy daughter of the 4th Duke of York, and a remarkably gay and elegant cow, began at 40 gs., and became Capt. Spencer's at 150 gs. She had only calved a red heifer calf about 23 hours before to Prince Duke, but the Captain was determined that the two should not be separated, though he had to pay 60 guineas to accomplish his intention. "Carry it out," was his direction, when the biddings ceased, and the precious little burden departed, kicking, in the arms of an attendant. Claribell, one of Sir Charles Knightley's breeding, became Lord Feversham's at something under its Fawley figure; the buyer of Master Butterfly made the last 67 guinea-bid for Jane; while Pimpernel, half-sister to the Duke of Beaufort's steer, who took the 2,500-franc-prize at Poissy, and was considered by a majority of the judges to have made the best *soup*, but to rank only seventh to his Grace's West Highland ox on the *roast beef* test, became Mr. Hoskyns's at 51 guineas. Bettine, for whom 100 guineas had been refused at Chelmsford, fell 10 guineas short at this time of asking; but such a slight shortcoming was made up for by a great bidding for Leila, out of Lizzy, a square massive heifer, with remarkable size and development for her age. Captain Spencer and Mr. H. Combe's agent ran each other up very briskly, but the Captain would not advance on the latter's 200 guineas, and thus Mr. Combe had the honour of giving the top price both at Dudding-hill and the Bushey-farm. The first bull which was put up, Privilege, was deficient both in his loins and ribs, and only 30 guineas was got for him, by slow degrees. The best price was 145 guineas for the very promising Brigadier, who was purchased by Mr. Knowles. In all, the 27 cow and heifer lots realized 1,874 guineas, being an average of nearly 69½ guineas, and the six bulls 428 guineas, or rather more than 71 guineas, which brought up the general average to nearly £73 10s.

Mr. Bolden's draft consisted principally of one tribe—and he still keeps three or four tribes in his herd—including his celebrated Duchesses, to which his two grand 1000-guinea Dukes are so closely allied. The blood of these two bulls was, however, traceable in only four of the stock to-day, for two of which, Bijou and Asia, the biddings were lively to a degree. Mr. Banks Stanhope, M.P., secured the former at 100 guineas; and in the case of the latter, the competition was confined to Lord Feversham and Mr. H. Combe's agent, who got the last bid at 91 guineas. Grasshopper did not sell very well; but Libel's shoulders were worth all the money (100 guineas) given for her by Mr. Rich, independent of her dash of the Collings, Bates, Booth, and Wiley herds; while one of the two bull calves, Mario, became the property of a tenant farmer (Mr. Dodwell) at 70 guineas. The sixteen lots fetched 993 guineas; and considering that they were erroneously looked on too much in the light of a draft, the £65 average was most satisfactory. Thus the successful resul

of Mr. Strafford's spirited experiment in having sales of this nature at seasons when he can command a good attendance from town, is placed by this double test beyond dispute.

The following were the prices realized:—

Mr. GRENFELL'S HERD.

- LOT COWS AND HEIFERS.
1. Pomp, white, calved April 3, 1848; got by Duke of Cornwall (5947), dam (Princess Royal) by Thick Hock (6601).—50 gs. Purchased by Mrs. Carr.
  2. Beatrice, red, calved Aug. 1, 1848; got by Cramer (6907), dam (Bessy) by Helicon (2107).—90 gs. Mr. Leslie, M.P.
  3. Victorie, red and white, calved July 4, 1849; got by Usurer (9763), dam (Victoria) by 2nd Duke of York (5959)—57 gs. Capt. Davis.
  4. Helen, white, calved in 1851; got by Prince Albert (10636), dam (Queen) by Uncle Dan (7656).—63 gs. Mr. Stirling, M.P.
  5. Darlington 4th, roan, calved February 26, 1852; got by Sir Hugh (12082), dam (Darlington 2nd) by Percy (9472).—76 gs. Mr. Peel.
  6. Parliament, roan, calved June 5, 1852; got by Fourth Duke of York (10167), dam (Pomp) by Duke of Cornwall (5947).—37 gs. Mr. Eastwood.
  7. Bibby, white, calved August 21, 1852; got by Fourth Duke of York (10167), dam (Bessy) by Helicon (2107).—90 gs. Mr. Allen.
  8. Pride, roan, calved Sept. 6, 1852; got by Fourth Duke of York (10167), dam (Princess Fairfax) by Lord A. Fairfax (4249).—100 gs. Mr. Eastwood.
  9. Lizzy, red and white, calved April 29, 1853; got by Fourth Duke of York (10167), dam (Louisa) by Cramer (6907).—150 gs. Capt. Spencer.
  10. Raspberry, roan, calved June, 1853; got by Buccanier (11218), dam (Ruby) by Red Rover (11982).—60 gs. Mr. Wilson.
  11. Parade, roan, calved August 7, 1853; got by Duke of Glo'ster (11382), dam (Pomp) by Duke of Cornwall (5947).—82 gs. Mr. Eastwood.
  12. Claribell, roan, calved Sept. 8, 1853; got by Earl of Dublin (10178), dam (Cyrilla) by Grey Friar (9172).—95 gs. Lord Feversham.
  13. Oak Bud, red and white, calved July 15, 1854; got by Duke of Glo'ster (11382), dam (Oak Apple) by Monarch (7249).—51 gs. Mr. Leslie, M.P.
  14. Venetia, red and white, calved August 14, 1854; got by Richmond (13591), dam (Victorine) by Usurer (9763).—55 gs. Mr. Guilden.
  15. Syllabub, roan, calved November 17, 1854; got by Puritan (9523), dam (Seraph) by Fanatic (8054).—66 gs. Mr. Stirling, M.P.
  16. Jane, roan, calved December, 1854; got by Frederick (11489), dam (Jeanette 2nd) by Prince of Denmark (10646).—67 gs. Mr. Bostock.
  17. Pimprenal, red and white, calved June 13, 1855; got by 4th Duke of Oxford (11387), dam (Picotee) by Percy (9472).—51 gs. Mr. Hoskin.
  18. Bettine, red and white, calved February 8, 1855; got by Richmond (13591), dam (Beatrice) by Cramer (6907).—90 gs. Mr. Hardy.
  19. Violetta, red and white, calved Sept. 16, 1855; got by Richmond (13591), dam (Victorine) by Usurer (9763).—50 gs. Mr. Black.
  20. Leila, red and white, calved Jan. 22, 1856; got by Count Glo'ster (12650), dam (Lizzy) by Fourth Duke of York (10167).—200 gs. Mr. Harvey Combe.
  21. Bonny Lass, roan, calved Nov. 5, 1856; got by Prince Duke (13507), dam (Bibby) by Fourth Duke of York (10167).—40 gs. Mr. Strafford.
  22. (*Not offered.*)
  23. Betsy, red and white, calved January 31, 1857; got by Privilege (13526), dam (Bettine) by Richmond (13591).—30 gs. Mr. Guilden.
  24. Darling, red and white, calved March 5, 1857; got by Fourth Duke of Oxford (11387), dam (Darlington 4th) by Sir Hugh (12082).—40 gs. Mr. Guilden.
  25. (*Not offered.*)
  26. Jauct, roan, calved March 23, 1857; got by Privilege

- (13526), dam (Jane) by Frederick (11489).—28 gs. Mr. Guilden.
27. Pageant, red and white, calved March 23, 1857; got by Count Glo'ster (12650), dam (Parade) by Duke of Glo'ster (11382).—44 gs. Mr. Eastwood.
28. Pompous, roan, calved May 2, 1857; got by Count Glo'ster (12650), dam (Pomp) by Duke of Cornwall (5947).—50 gs. Mr. Eastwood.
29. Red calf, calved May 20, 1857; got by Prince Duke (13507), out of Lizzy.—60 gs. Capt. Spencer.

BULLS.

1. Privilege (13526), roan, calved December 11, 1854; got by Richmond (13591), dam (Pomp) by Duke of Cornwall (5947).—30 gs. Lord Lucan.
2. Protector (13538), roan, calved December 29, 1854; got by Richmond (13591), dam (Princess Fairfax) by Ld. A. Fairfax (4249).—41 gs. Mr. Martin.
3. Brigalier, red and white, calved January 30, 1856; got Count Glo'ster (12650), dam (Beatrice) by Cramer (6907).—145 gs. Mr. Knowles.
4. Rufus, roan, calved June 15, 1856; got by Columbus (12616), dam (Raspberry) by Buccanier (11218).—86 gs. Mr. Hercey.
5. Victor, red and white, calved August 23, 1856; got by Prince Duke (13507), dam (Victorine) by Usurer (9763).—43 gs. Mr. Christy.
6. (*Not offered.*)
7. Prince Henry, roan, calved February 22, 1857; got by Prince Duke (13507), dam (Helen) by Prince Albert (10636).—55 gs. Mr. Aylmer.
8. Sylvan, roan, calved March 20, 1857; got by The Buck (13836), dam (Syllabub) by Puritan (9523).—28 gs. Mr. Crouch.

MR. BOLDEN'S HERD.

- LOT COWS AND HEIFERS.
1. Dolly, red and white, calved March 27, 1847; got by Second Cleveland Lad (3408), dam (Dinah) by 4th Duke of Northumberland (3649).—30 gs. Purchased by Mr. Martin.
  2. Buttercup, roan, calved May 3, 1848; got by Homer (2134), dam (Butterfly) by Sir Lancelot (5166).—38 gs. Mr. Slye.
  3. Polyanthus, red, calved Nov. 12, 1849; got by 3rd Duke of Oxford (9047), dam by 2nd Cleveland Lad (3408).—47 gs. Mr. Harrison.
  4. Victoria 22nd, red, calved Jan. 9, 1852; got by Lord John (11731), dam (Victoria 13th) by Comus (12625).—81 gs. Capt. Davis.
  5. Libel, red, calved Feb. 13, 1852; got by Rumour (7456), dam (Lettuce) by Leonard (4210).—100 gs. Mr. Rich.
  6. Grasshopper, roan, calved May 19, 1852; got by Molecatcher (10537), dam (Cicely) by Mahomed (6170).—62 gs. Mr. Woodward.
  7. Victory, red, calved June 3, 1852; got by 3rd Duke of York (10166), dam (Vienna) by Duke of Richmond (7996).—41 gs. Lord Emlyn.
  8. Apricot, roan, calved July 31, 1853; got by Fusileer (11499), dam (Augusta) by 3rd Duke of York (10166).—50 gs. Mr. Slye.
  9. Bijou, roan, calved Nov. 6, 1853; got by Grand Duke (10284), dam (Buttercup) by Homer (2134).—100 gs. Mr. Stanhope, M.P.
  10. Primula, roan, calved Sept. 2, 1855; got by Duke of Bolton (12738), dam (Polyanthus) by 3rd Duke of Oxford (9047).—60 gs. Duke of Montrose.
  11. Tranquil, red, calved Oct. 24, 1855; got by Duke of Bolton (12738), dam (Turban) by Felix (10225).—47 gs. A. Rothschild.
  12. Peace, red and white, calved March 30, 1856; got by 2nd Grand Duke (12961), dam (Dolly) by 2nd Cleveland Lad (3408).—80 gs. Mr. Surtces.
  13. Asia, red, calved April 5, 1856; got by 2nd Grand Duke (12961), dam (Apricot) by Fusileer (11499).—91 gs. Mr. Harvey Combe.
  14. Gallopade, red and white, calved Dec. 3, 1856; got by Duke of Dorset, dam (Grasshopper) by Molecatcher (10537).—63 gs. Mr. Stanhope, M.P.

## BULLS.

1. Mario, red, calved Nov. 25, 1856; got by Duke of Dorset, dam (Garcia) by Grand Duke (10284).—70 gs. Mr. Dodwell.
2. Victorious, red, calved March 6, 1857; got by 2nd Duke of Bolton (12731), dam (Victory) by 3rd Duke of York (10166).—33 gs. Mr. Bramston, M.P.

## MR. STEWART MARJORIBANKS' HERD.

By MR. WETHERELL, AT BUSHEY.

The whole of this far-famed herd came beneath the hammer of Mr. Wetherell on Friday last, and achieved prices which will long make the Bushey Grove sale "a great fact" in the annals of shorthorns. Fifty-nine lots produced 5,064 guineas, of which 3,048 guineas must be credited to the cows and heifers, and 2,016 gs. to the bulls. For the former the average was about £72 10s., and for the latter £149 5s., which brings up the total average to as nearly as possible £90 2s.

In spite of a steady fall of rain, which continued with very little intermission until four o'clock, the company began to arrive at the Bushey Farm soon after ten, and made a strong muster both from town and country. The sale, like that at Dudding Hill, was of a "truly British" character, as nearly all the first short-horn breeders in the United Kingdom attended, and not a single animal, that we have heard of, was bought to leave the country. All the arrangements were of the most perfect kind, and it has never fallen to our lot to see a herd "brought to the post" in a more blooming healthy state, speaking volumes for the skill and care of Mr. Tallant, the bailiff, who was also most unwearied in his attention to visitors. Nearly two hours were occupied in the tour of inspection, and although Marmaduke's box was never empty, the splendid seven months calf, Great Mogul, by Grand Turk, was looked upon as the prime feature of the sale, and his *levee* never flagged in numbers for a moment. He has all the substance and robust style of his sire, with an equally grand coat, and showed all the fine character of the Bates and Booth herds. In fact, he was allowed to be as nearly perfect as possible in every point, except behind the shoulders, and in consequence of this defect he was not generally laid at more than 300 guineas, and not a few bets were depending both on his and Marmaduke's probable price—the latter, a beautiful specimen of the Duke of Gloucester breed, is not a very large, but a remarkably sweet bull. He was bred by Mr. Tanqueray, and purchased at that gentleman's sale, when a calf, for 100 gs. The Kibirkees were also a very prominent family of the good old sort, and combining two crosses of Bates. About one o'clock a general move was made to the barn, which was handsomely festooned with flowers, and a very excellent lunch was presided over by Mr. Wetherell and Mr. Dudley Majoribanks. The health of the latter gentleman and his venerable uncle (who was at the farm during a short part of the morning) were drunk along

with Mr. Tallant's; and when the second detachment had lunched, Mr. Wetherell "called time," and led the way, at two o'clock precisely, to the sale field. A ring was formed of high hurdles, round which several waggons were drawn up filled with straw; and Mr. Wetherell took his station in one of them, under a large sail awning, while the Dukes of Montrose and Newcastle, the Earl of Essex, with Mr. D. Marjoribanks and a party of friends, occupied one of the others. The animals were led into the ring through a hurdle avenue, and the cows were dismissed, as soon as the hammer fell, on the opposite side, into the rich meadow, which was the appropriate site of the sale. Victoria, the twelve-year-old dam of the Great Mogul, was the first lot; but even the anticipated glories of her son could not force her beyond 61 guineas. There was some doubt as to whether Heroine could be shown, as she was then in labour with a calf to Marmaduke; and when she did come, she did not reach more than 51 guineas. The strong dash of the "old blood" of Robert and Charles Collings' did not effect much more for Sunset; but the biddings for the fourth lot, Rarity, were excessively spirited, and Mr. Dudley Marjoribanks was the last bidder at 87 guineas. Kibirkee was put up at 40 gs.; and after a rapid succession of ten-guinea bids, the hammer fell for 130 guineas; and Broadhooks, who had an enormous adder, became Mr. Cruikshank's for 70 guineas, which was at least 30 guineas below what he was prepared to have gone to for her. Cassandra, by the 400 guineas' Usurer, realized 110 guineas, or 65 guineas below what she was once sold for; and in consequence of some dispute arising as to who made a 75-guinea bid, Harmony was put up again, and finished at 66 guineas. In the first go Colonel Kingscote went as far as 73 guineas, but ried in the second. Rhoda did honour, by her 92-guinea price, to "Booth's best blood;" and Ladykirk's nine-days' calf was knocked down for 25 guineas to Mr. Wells, who had also bought the cow. Victorine, of the Robert Holmes breed, hardly came up to her original price; and Mr. H. Combe then gave 140 guineas—the best cow-price of the sale—for Kirkhee 2nd. Mr. Grundy also got a very choice eighteen-months' heifer in Diamond; and the next lots, Blithesome and Doralisa (who was bred by Sir Charles Knightley, and sold at his sale when a fortnight old for 40 guineas), were much admired, and occasioned some keen competition. The former fell to Lord Feversham, for 70 guineas; and his lordship and the Duke of Montrose (both of whom bid in person) had a very spirited contest for the latter, in which His Grace just lasted the longest. Lord Feversham, however, carried his point, at 96 guineas, in the case of Symphony; and Mr. Elmore got Busy Bee at a lower figure than the first biddings promised, as the sale hung slightly at this point; and then Prince Albert secured Charmer at 30 guineas, through his agent, Mr. Wilson.

"Who'll bid 500 first?" was Mr. Wetherell's prophetic query; and Marmaduke had no sooner shown his splendid form in the ring than Mr. Duckworth put him in at 200 guineas. 300 guineas was the next bid—



"Come away!"—"I won't dwell," was Mr. W.'s exhortation—310 guineas, 350 guineas, and so on by tens till 400 gs. was bid in two places; and at last came a clincher in the shape of 500 guineas from Mr. Harvey Combe, who found no one bold enough to cope with him further; Mr. Cruikshanks having stopped at 400 gs. The red Master Butterfly 2nd, bred by Mr. Townley, succeeded, and received a 100-guinea bid *instantly*; then came 150 guineas and 200 guineas; and, after very little "dwelling," Mr. Cruikshanks was declared the buyer at 400 guineas. We may mention that all the cows in the herd had been served by these two bulls. The Duke of Sutherland, who won a prize at Paris in 1855, fetched 87 guineas, or 58 guineas less than Cobham, who became Lord Zetland's, after a series of sharp biddings; and the blood of King Arthur, by Crown Prince, out of Booth's celebrated Venus Victrix, received fair homage to its merits, in Duke Arthur and Sam Sinek. A slight humour on the heel rather militated against Charger's price; and as Sailor, the last lot, was withdrawn, in consequence of his being below the mark, the Great Mogul brought the sale to a brilliant *finale*. The bidders would hardly wait for Mr. Wetherell, and set wildly to on their own account, all round the ring. In fact, when one on the far side gravely said "70 guineas!" during a pause, Mr. Wetherell retorted with "Why, we've had 200 guineas all round, long since!" A remote voice shortly after said, "250 guineas!" and again Mr. Wetherell rejoined, "You can't go the pace—I've got 300 guineas already!" After this point, several were choked off; and some steady bidding ended in favour of Mr. Duckworth, at 400 guineas. In reply to Mr. Wetherell's jocular challenge to lay him £100 that his bull would win at Salisbury, against Skirmisher winning the Derby, he replied that he was no betting man, but that the bull would meet all comers at the ensuing Royal Show. It has since, however, been arranged that Mr. Marjoribanks is to retain his young prodigy, as the rules of the Royal Society would not allow of any new owner exhibiting him this year in the bull calf class. The sale occupied, in all, nearly three hours; and by half-past six the majority of the London visitors had bid farewell to their country cousins, and were once more landed at Euston-square.

The following is a list of the prices realized—

LOT. COWS AND HEIFERS.

1. Victoria 8th, red, calved 1845; got by Sir John Sinclair (5165), dam (Victoria 4th) by Prince Albert (11933).—61 gs. Purchased by Mr. Moore.
2. Heroine, roan, calved May 20th, 1848; got by Fairfax Royal (6987), dam (Goswick 3.d) by the Peer (5155).—51 gs. Mr. Lumbe.
3. Dattarol, roan, calved February 24th, 1849; got by The Duke (8676), dam (Wheaton) by Warrior (6560).—66 gs. Captain Davis.
4. Sunset, roan, calved April 4th, 1849; got by Twilight (9758), dam (Maid of Lorn) by Augustus (6752).—62 gs. Mr. Baker.
5. Rarity, roan, calved April 7th, 1850; got by Preston (8403), dam (Railway) by South Star (7553).—87 gs. Mr. Dudley Majoribanks.
6. Songstress, roan, calved April 19th, 1850; got by Rodolph (9568), dam (Bridesmaid) by Sir Launcelet (5166).—60 gs. Col. Kingscote.

7. Khriske, roan, calved November 5th, 1850; got by Young Fourth Duke (9037), dam (Jenny Lind) by Duke of Richmond (7996).—130 gs. Mr. Robinson.
8. Larrington, roan, calved February 12th, 1851; got by Prince Edward Fairfax (9506), dam (Bianciana) by The Pacha (7312).—73 gs. Capt. Davis.
9. Fair Belle, roan, calved February 23rd, 1851; got by Prince Edward Fairfax (9506), dam (Bliza) by White Bull (5613).—3 gs. Mr. Simpson.
10. Wild Rose, roan, calved March 31st, 1851; got by Calvaire (16933), dam (Moss Rose) by Belshazzar (1793).—70 gs. Mr. Harrison.
11. Broadbroke 4th, roan, calved April 1st, 1851; got by Velvet Jacket (10998), dam (Young Broadbroke) by Fitz Adolphus Fairfax (9121).—70 gs. Mr. Crookshank.
12. Batta ma 11th, red and white, calved April 18th, 1851; got by Lord John (11731), dam by Albion (7771).—33 gs. Mr. Elmore.
13. Miaz, roan, calved May 6th, 1851; got by Duke of Richmond (7996), dam (Matilda) by Lord Stanley (1269).—42 gs. Mr. Hall.
14. Careless 2nd, roan, calved July 22nd, 1851; got by Squire Gwynne (12110), dam (Caroline) by 2nd Cleveland Ltd (3108).—115 gs. Mr. Gulden.
15. Airy Gwynne, roan, calved October 21st, 1851; got by Squire Gwynne (12110), dam (Aenes) by Fanatic (8054) 90 gs. Mr. Abbott.
16. Rosabel, roan, calved November 6th, 1851; got by Fanatic (8054), dam (Rosebud) by Auld Robin Gray (6753).—47 gs. Mr. Torr.
17. Lucy 2nd, roan, calved June 1st, 1852; got by Lord Poppington (10137), dam (Lucy) by Mambriao (7196).—105 gs. Mr. Bedger.
18. Lady Augusta, white, calved in May, 1852; got by Paritan (9523), dam (Lady Mary) by Lord of Gilling (6587).—70 gs. Mr. Woodward.
19. Verbena, red and white, calved July 25th, 1853; got by The Bean (12182), dam (Violet) by Liberal (10413).—51 gs. Mr. Byron.
20. Cassandra, roan, calved October 1st, 1853; got by Usurer (9763), dam (Curlew) by Benedict (7848).—110 gs. Mr. Leslie.
21. Harmony, roan, calved April 1st, 1854; got by Matadore (11899), dam (Heroine) by Fairfax Royal (6987).—66 gs. Mr. Waits.
22. Amazon, white, calved April 2nd, 1854; got by Whittington (12299), dam (Ariopina) by Duke of Rothsay (6943).—50 gs. Col. Kingscote.
23. Rueda, roan, calved April 24th, 1854; got by Baron Albany (11151), dam (Rosabel) by Fanatic (8054).—92 gs. Mr. Byron.
24. Ladykirk, white, calved April 27th, 1854; got by Matadore (11899), dam (Laurastina) by Prince Edaard Fairfax (9506).—70 gs. Mr. Wells.
25. Victorie, red and white, calved June 1st, 1855; got by Baron Martin (12144), dam (Victoria 13th) by Comus (12625).—91 gs. Mr. G. W. dy.
26. Khriske 2nd, roan, calved January 29th, 1855; got by Mcbourne (13327), dam (Khriske) by Young Fourth Duke (9037).—140 gs. Mr. H. Combe.
27. Rarafa, white, calved October 7th, 1855; got by King Arthur (13110), dam (Rarity) by Preston (8403).—63 gs. Mr. Tracy.
28. Diamond, roan, calved December 1st, 1855; got by King Arthur (13110), dam (Dairymaid) by Normauby (10573).—125 gs. Mr. Grady.
29. Blithesome, red and white, calved February 2d, 1856; got by King Arthur (13110), dam (Broadbroke 4th) by Velvet Jacket (10998).—70 gs. Lord Feversham.
30. Darlish, roan, calved March 16th, 1856; got by Duke of Cambridge (12712), dam (Maiden's Blush) by Scindler (10733).—85 gs. Duke of Montrose.
31. Khriske 3rd, roan, calved June 1st, 1856; got by King Arthur (13110), dam (Khriske) by Young Fourth Duke (9037).—62 gs. Mr. Grady.
32. Jeany Deans, white, calved July 6th, 1856; got by Jock of Hazlehan (13055), dam (Airy Gwynne) by Squire Gwynne (12110).—30 gs. Mr. D. Majoribanks.
33. Lass of Gowrie, red and white, calved Aug. 23th, 1856; got by Duke of Argyll (11375), dam (Laurastina) by Prince Edward Fairfax (9506).—70 gs. Mr. Packe, M.P.

34. Symphony, red and white, calved September 19th, 1856; got by Jock o' Hazledean (13085), dam (Songstreas) by Rodolph (9568).—96 gs. Lord Feversham.
35. Annie, roan, calved September 20th, 1856; got by Duke of Argyle (11375), dam (Lady Augusta), by Lottery (10472).—51 gs. Mr. D. Majoribanks.
36. Dimple, white, calved Oct. 22nd, 1856; got by Brigand (12494), dam (Dotterel) by The Duke (8676).—60 gs. Mr. Simpson.
37. Verity, red and white, calved October 22nd, 1856; got by Cecil (12571), dam (Victorine) by Barou Martin (12444).—46 gs. Mr. Leslie.
38. Royalty, roan, calved Nov. 19th, 1856; got by Brigand (12494), dam (Roguery) by Cotherstone (6903).—52 gs. Mr. Lamb.
39. Busy Bee, roan, calved Jan. 13th, 1857; got by Brigand (12494), dam (Britannia 11th) by Lord John (11731).—56 gs. Mr. Elmore.
40. Raree Show, red, calved Feb. 10th, 1857; got by Garland (12917), dam (Rarity) by Preston (8408).—45 gs. Baron A. Rothachild.
41. Bessie Bell, red, calved Feb. 16th, 1857; got by Garland (12917), dam (Broadbooks 4th) by Velvet Jacket (10998). 37 gs. Mr. Chambers.
42. Charmer, white, calved February 27th, 1857; got by Marmaduke (lot 1, Bulls), dam (Casandra by Usurer (9763)).—30 gs. H. R. H. Prince Albert.
43. Coquette, roan, calved February 28th, 1857; got by Garland (12917), dam (Careless 2nd) by Squire Gwynne (12140).—40 gs. Mr. Aylmer.
44. Khirkee 4th, roan, calved March 23rd, 1857; got by Marmaduke (lot 1, Bulls), dam (Khirkee 2nd) by Melbourne (13327).—55 gs. Mr. Hill.

BULLS.

1. Marmaduke, roan, calved March 7th, 1855; got by Duke of Glo'ster (11382), dam (Minerva 2nd) by St. Martin (8525).—500 gs. Purchased by Mr. Harvey Combe.
2. Master Butterfly 2nd, red, calved July 3rd, 1855; got by

- Master Butterfly (13311), dam (Vestris 2nd) by Valiant (10989).—400 gs. Mr. Crookshanks.
3. Garland, red, calved March 10th, 1854; got by Saxe Gotha (10786), dam (Daffodil) by The Duke (8676).—50 gs. Mr. Sharpley.
4. Brigand, white, calved June 4th, 1854; got by Bushranger (11228), dam (Fair Belle) by Prince Edward Fairfax (9506).—41 gs. Mr. Duckworth.
5. Admiral Dundas, white, calved September 28th, 1854; got by Duke of Argyle (11375), dam (Dotterel) by The Duke (8676).—36 gs. Mr. Duckworth.
6. Duke of Sutherland, white, calved February 11th, 1855; got by Melbourne (13327), dam (Diamond) by Valentine (9768).—87 gs. Mr. Hamilton.
7. Cobham, roan, calved July 1855; got by Duke of Argyle (11375), dam (Careless 2nd) by Squire Gwynne (12140).—145 gs. Lord Zetland.
8. Dandy Dinmont, white, calved January 20th, 1856; got by King Arthur (13110), dam (Diamond) by Valentin (9768).—37 gs. Capt. Davis.
9. Duke Arthur, roan, calved February 26th, 1856; got by King Arthur (13110), dam (Verbena) by The Beau (12182).—100 gs. Mr. Greetham.
10. Sam Slick, roan, calved March 8th, 1856; got by King Arthur (13110), dam (Sunset) by Twilight (9758).—91 gs. Mr. Robinson.
11. Charger, white, calved April 20th, 1856; got by Cecil (12571), dam (Cassandra) by Usurer (9763).—30 gs. Mr. Wallis.
12. Hero of Kars, roan, calved May 3rd, 1856; got by King Arthur (13110), dam (Heroine) by Fairfax Royal (6987).—44 gs. Mr. Brooke.
13. Abelard, roan, calved July 3rd, 1856; got by King Arthur (12110), dam (Amazon) by Whittington (12299).—30 gs. Mr. Worsoop.
14. Great Mogul, roan, calved October 26th, 1856, got by Grand Turk (12969), dam (Victoria 8th) by Sir John Sinclair (5165).—400 gs. Mr. Duckworth.
15. Red Calf, calved May 17th, 1857; got by Marmaduke out of Lady Kirk.—25 gs. Mr. Wells.

THE WHEAT TRADE—PAST AND PRESENT.

A Liverpool correspondent has requested us to reply to several queries respecting the past, present, and future of the wheat trade. We insert his letter, and now shall endeavour to answer his questions, so far as existing facts, and our deductions from them, may be considered reconcilable with each other.

The imports of wheat, and flour as wheat, for the last six years, have been as follows:—

Years.	Quarters.
1851 .....	5,330,418
1852 .....	4,164,603
1853 .....	6,235,860
1854 .....	4,473,085
1855 .....	3,211,766
1856 .....	5,207,147
(6) 28,622,879	

4,770,479<sup>3</sup>/<sub>4</sub> qrs.

Thus we have had an average import of rather more than 4<sup>3</sup>/<sub>4</sub> million quarters the last six years; and, upon a reference to the previous similar period, we find the average rather more than 4 millions: but this included two years when our ports were closed against free importations by the corn laws. During the seven seasons from 1847 to 1854, the average annual importa-

tions were 4,963,000 quarters. These figures, altogether, will afford correct data to form a judgment as to what the requirements of the country will be in future; but the peculiarity of the six last years require some explanations.

The year 1851 was favourable to the wheat crop in England, and a fair average quantity was reaped. The following season was less propitious, a good deal of rain having fallen during the harvest, by which the quality of the grain was injured, and the proportion of flour per quarter reduced in both quantity and quality. The continuance of the wet weather after the harvest of 1852, and throughout the autumnal seed-time, prevented the low lands from being sown with wheat. The same cause continued to operate in the following spring, allowing the farmers no opportunity of supplying the deficiency with spring wheat. The consequence was, that not more than four-fifths of the average breadth was sown that year; and not only this, but so saturated was the land with moisture, that the growing crop was materially injured, so that at harvest (1853) the estimated result was, that a deficiency had arisen in the annual produce, of 6,857,143 quarters—namely, 3,200,000 quarters in breadth sown, and 3,657,143 quarters in the acreage yield, rendering (when added to

the average importations) an import of nearly 12 million quarters necessary, unless a substitute could be found. Fortunately there was a heavy stock of old English and foreign wheat on hand, probably to the amount of between six and seven million quarters, which, with an import of  $6\frac{1}{4}$  millions in 1853-4, enabled us to drift through the worst season we have had for forty years. But this left us, at the harvest of 1854, wholly destitute of stock, and dependent upon the new crop for the next year's consumption. That crop, however, was as large as the previous one was deficient, both in breadth sown and in yield; and to this may be ascribed the circumstance that no deficiency arose at the latter end of the previous season. So anxious were the farmers to clear out the stocks of wheat, under an apprehension that, with a heavy crop, prices must come down, that the markets were well supplied up to the harvest. We all know the result—that the following year prices were well sustained, the crop being just sufficient, with a small importation, to meet the consumption, and *no more*; leaving us at the harvest of 1855 nearly as bare of stock as at that of 1854.

The crop of 1855 was a moderate one; but the knowledge that the stocks, both with us and on the continent (where a partial failure had occurred in the crop of wheat), were exhausted, induced the farmers not only to sow their usual breadth of wheat land, but also to prepare their root-crop lands for a spring sowing of wheat to an extent never before attempted. The season proving propitious, especially for the light and mixed soil lands, the crop of 1856 is believed to have fallen little short in the aggregate of that of 1854, although the acreage yield was not so large as in that year. Up to the present time the quantity of English wheat brought to market, although not overwhelming, has been sufficient for the consumption; and, with a full average importation, has occasioned gradually declining prices. We do not apprehend that there will be any deficiency in the supply between the present time and the harvest, which will probably be at least a fortnight earlier this year than that of 1856.

With respect to the supply of foreign wheat from the 1st of September to the 1st of January, the imports for those four months, in wheat and flour, amounted to 2,109,465 quarters, a large proportion of which came from the United States. During the first three months of the present year we have imported only 779,871 quarters, of which 428,485 quarters, or more than half, came from the States. It appears, however, by letters received from thence this week, that they have been exporting too freely; so that wheat and flour have risen above the price at which it can be exported at a profit. Added to this, the accounts of the growing wheat crop in that country are very unfavourable; and as a deficiency of one-sixth, or about  $2\frac{1}{4}$  million quarters, *would leave them no surplus to export*, we may form an opinion how far we can depend on the Americans for a supply next season, supposing the apprehensions about the crop should be realized.

Looking at the imports the first three months of this year, and comparing them with those of the same

period last year, we find them fall short to the extent of 27,283 quarters, although Russia has furnished this year 69,682 quarters *direct*, and through the Prussian ports 40,275 quarters; whilst last year we received none from the former, and only 4,864 quarters from the latter source. This would look more serious were it not that the Russian ports will be open to us in future, and that we shall in all probability have increasing supplies from thence every year. It is, in fact, to Russia, especially Southern Russia, and the Danubian Principalities, that we must look with any certainty for our European supply of bread-corn.

Although we are by no means disposed to take a gloomy view of our future prospects, yet we cannot shut our eyes to the following facts, which lie even on the surface, without taking into account with them the contingencies which may occur to disturb still further the relations between demand and supply. First, as our correspondent states, we have a yearly increasing population to provide for; secondly, grazing is likely to pay so well, for the next few years at least, that it is probable more land will be devoted to the breeding and feeding of cattle and sheep than has been known of late years. Thirdly, as our correspondent again observes, the losses in the corn trade have been heavy and numerous enough to annihilate speculation, and throw a damp even upon regular trading in corn. We again repeat that we do not apprehend any serious deficiency on this side harvest, although, if the American accounts turn out to be correct, the manufacturing districts, which depend a good deal upon that country for a supply, and Liverpool, which is the emporium of the American trade, will probably experience some inconvenience and difficulty in obtaining the requisite quantity. But we look further, and feel some apprehension lest, with reduced stocks of wheat in all the cereal districts of the world, and *without* an increasing, rather a decreasing produce in many of them, the failure of a crop in America, Russia, or any of the principal wheat-growing and exporting countries, should leave us with such a deficiency of supply as would drive up the price beyond due bounds. We imported from the United States last year 2,105,184 quarters. The stoppage of such a supply from one quarter—and we have shown what would do this—would indeed be a serious evil. Any such danger as this we must prepare against, by striving to accumulate a stock in the country sufficient to meet such a contingency, and thus avoid those extreme prices which are always attended by distress to the consumer, and are most frequently followed by ruin to the merchant.

GOOSEBERRY BUSHES.—To prevent the gooseberry from being attacked by mildew, cover the soil around the roots with a stratum of salt hay, two or three inches thick, and allow it to remain through the season. Irrigating once a week with soap suds, taking care to sprinkle all the foliage with the fluid, will also be beneficial. One thing, however, should be observed in the cultivation of this fruit, and that is, never to plant the bushes under trees or in the shade.—*New England Farmer*.

## CALENDAR OF AGRICULTURE.

Sow turnips in succession—swedes till the middle of the month; then green rounds, and ultimately white globes. Turnips are mostly finished in sowing during this month. In sowing turnips with all pulverulent and auxiliary manures, use Hornsby's drop-drill, which sows two rows, and deposits, at regular intervals of nine inches, the manure and the turnip-seeds mixed together, which secures a ready food to the young plants. Plough pared and burned lands with a light furrow, and produce a fine tilth by means of ample harrowing before sowing the seed towards the end of the month. If the land be clayey and stiff, sow on the furrow-slice well harrowed; if it be loamy, reduce the land and drill it, which will produce a good mixture of the land and the ashes. Sow rape and cole-seed for winter food. Plough lands from which winter tares are consumed; harrow it well, and sow the seeds in rows by a machine with lengthened coulter to make ruts in the ground. Sow in broadcast the headlands of turnip fields, and use short dung to be easily covered.

Horse and hand-hoe beet-root, carrots, and parsnips; allow not a single weed to be seen in any green crop cultivation.

Harrow potato-drills with the light harrows, plough the intervals of the drills deeply, scuffle repeatedly the hollows during summer, break the drills and all clods with the hand-hoe, cut every weed, and produce a fine tilth of soil, that is so essential to green crops.

Continue the feeding, in the yards, of cows and horses with clovers and vetches; feed them amply, provide abundant littering, and convey the liquid excrements to the tank.

Cut all weeds from among the grain crops; allow not any weeds to perfect the seeds on pastures by fences or on road sides. Many seeds are winged, and are carried by the wind to a distance, and propagate very rapidly.

Finish the shearing of sheep by the end of the month; examine the animals closely as they pass through hands at this time in the month—the shape, the quality of the wool, and in the general appearance. An inspection of the animals at this time, and putting on them distinctive marks, will very much assist the sorting of the ewes for the tupping season in October.

Put mares to the stallion every fortnight. Wean lambs by placing them beyond hearing the bleating of the ewes, and give them the best grass on the farm.

Hay-cutting will commence this month. Ted the swathe quickly behind the mowers, cock the grass, spread it abroad, cock it again, and carry it to the rick: employ plenty of hands—at least six to a mower. Turn clovers in the swathe without tedding, as much shaking loses the leaves, which are the best part of the plant: put it into large cocks, which may stand in the field for a time. When hay is damaged by rain, the quality is improved by mixing salt in the ricks—30 lbs. to a load.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR MAY.

Although we have had rather a long continuance of easterly winds, the weather during the month just concluded has been seasonably fine and somewhat vegetative; still, in a comparative sense, the season is somewhat backward, especially in the southern portion of the island. In the early part of the month rather large quantities of rain fell in the north, as well as in Ireland and Scotland; since then, the south has received its fair share of moisture, but without adding much to the supply of grass. A few weeks, however, will, no doubt, make a great change in this respect, especially in the event of the weather proving mild, and at present there are indications of a good hay crop.

Considering the amount of consumption going on, the wheat trade has been in an inactive state, but all spring corn has sold steadily at full prices. Both holders and importers of produce, as well as the large buyers, are likely to que-

rate with more than usual caution for some time, and it is possible that present quotations may be fairly supported. For some time our farmers have thrashed out large supplies of wheat, under the impression that prices have not seen their lowest point. Whether they are justified in taking such a step remains to be seen, but our impression is that the chances are more in favour of firm than drooping currencies. Upon the subject of the supply of grain in the hands of our farmers opinions are much divided, and it is boldly asserted in more than one quarter that it is unusually small. We, however, hold a contrary opinion, because we are perfectly satisfied that more wheat was grown in the United Kingdom in 1856 than in the previous year; its quality, we all know, was very inferior, but there is a large supply of food yet to be worked off. These remarks may serve as a guide to the growers, and they may further produce less confidence on the part of the speculators in forwarding orders to the continent and the United States at

prices which leave no margin of profit. With the exception of beans and peas, the supplies of spring corn are worked up to a narrow compass, and we may fairly conclude that prices generally will rule steady for a considerable period.

The month's importations of wool have been on an extensive scale, viz., over 20,000 bales. This large arrival, added to the high value of money in the discount market, has had rather a depressing influence upon the trade, and prices have given way from 1d. to 2d. per lb. This decline is, we imagine, likely to be followed by another fall, as apparently most parties have wholly miscalculated the power of the supply to meet the trade. The unfavourable news from Australia, in reference to the import trade of the colony, has checked the demand for wool, and the absence of active speculation on the continent has, no doubt, tended to lessen confidence here. Unquestionably, wool, both home and colonial, has seen its highest point of value, and there is now ample room for a further decline in it. The advanced rates now paid, compared with two years since, are quite justified by the late continuous demand and the decline in the importations. But matters are now wholly changed; from the Cape, as well as from Australia, we are now receiving additional supplies, and we are likely to receive further imports of an important character.

The young wheat plants are looking remarkably strong and healthy—the exceptions of these important points being unimportant—and the fine rains have been productive of an immense amount of benefit to barley, oats, beans, and peas. The pastures are fairly covered with grass both in the north and south, whilst green food has become somewhat abundant and cheap. These are all favourable features at this moment, and they must have considerable influence upon demand and value during the coming month. Certainly, there is nothing to complain of: prices generally are remunerative, imports are only moderate, and the consumption is large, though, perhaps, in the manufacturing districts, the demand for the better kinds of food is not quite so active as was the case at this time last year.

Home-grown potatoes have advanced considerably in price of late, and the rise in the quotations has been followed by an import of nearly 3,000 tons from the Continent. We learn that our stocks are now much reduced, and that a large quantity of the potatoes on hand will be found unfit for human consumption. Linseed has been in moderate demand throughout the month; nevertheless, prices have continued steady. Both descriptions of cake have sold slowly, yet we have very little change to notice in their value. The consumption of these articles is still very large, but we believe that we are justified in saying that it is not in excess of our importations.

Throughout Ireland and Scotland wheat has sold on easier terms, but spring corn has changed hands steadily, at very full prices. Fat stock has been in good request, at high rates; yet the quantities of produce forwarded to England have not increased.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Owing to a somewhat important increase in the supplies of both home and foreign stock exhibited in the metropolitan and the leading provincial markets, the cattle trade generally, during fully the first half of the past month, was heavy, at drooping prices. Since then, however, the receipts have fallen off, and the demand has ruled brisk, at an important improvement in the quotations. The return

of fine mild weather has caused the arrivals of Scotch and country-killed meat up to Newgate and Leadenhall to fall off, and hence the live trade has been thus benefited to some extent.

The imports of stock from the Continent have been on the increase, though only moderate for the time of year; and the recent order in Council in reference to the so-much-complained-of disease in some parts of Germany has not had any effect upon our trade, and this was to be expected—indeed, we fully explained this matter in our last month's review—because we have never been dependent upon Germany for the bulk of our importations. The sheep which have reached us from Hambro' within the last few weeks—wholly Merinos—bear no traces of disease; and it must be gratifying to learn that throughout Holland the stock is healthy. We use the word "gratifying" in a strictly economical sense; in other words, for the purpose of showing that it would be the height of folly to calculate upon prices here ruling much above those now current in our markets. A deficient amount of home supply frequently leads to the most exaggerated notions as regards the future; but every one must admit that price must have a limit, that is to say, you may import a large amount of food, but the whole will be consumed at moderate rates, because the power of consumption here, if prices be only moderately low, is enormous. Advance the quotations some 20 or 30 per cent., and you check consumption immediately: you deprive the butcher of the opportunity of getting rid of his inferior joints, except at a loss, and you produce a great amount of fluctuation in price. The jobbers lose money, the stock masters are disappointed, and the carcase butchers are sorely puzzled to know how and to what extent to operate. We therefore are glad to find that there is a prospect of fair importations of foreign stock, and we hope that they will have the effect of keeping prices free from severe fluctuations; not that we anticipate any material change in price; certainly we do not think that any great fall will result from even a moderate increase in our importations, as France is still purchasing stock in Holland and Belgium, as well as in Spain and Portugal. From the two latter countries we are likely to draw some rather large supplies of beasts during the summer, as the arrivals during the present month have, we understand, turned out somewhat profitable.

The supply of winter food has become nearly exhausted; in some counties scarcely any remains on hand, but the abundant quantity of hay produced last year has been of immense advantage to the graziers, and the fine rains of the month, aided by a mild temperature, have produced a fair, though not an abundant supply of grass: hence the prospects of the next hay crop are very favourable.

The annexed return shows the imports of foreign stock into London:—

Beasts.....	1,539 head.
Sheep.....	4,749 „
Lambs.....	60 „
Calves.....	877 „
Pigs.....	18 „
Total.....	7,243

Same time in 1856.....	3,556 head.
„ 1855.....	7,103 „
„ 1854.....	4,706 „
„ 1853.....	13,007 „
„ 1852.....	8,506 „
„ 1851.....	9,214 „
„ 1850.....	6,060 „

WEST GLOUCESTERSHIRE.

The total supplies of home and foreign stock exhibited in the Great Metropolitan Market have been:—

Beasts.....	18,722 head.
Cows.....	450 "
Sheep and lambs.....	104,990 "
Calves.....	1,415 "
Pigs.....	2,530 "

COMPARISON OF SUPPLIES.

May	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1856....	18,995	495	119,640	1,260	2,545
1855....	19,847	410	113,600	2,470	2,590
1854....	20,331	576	124,824	2,146	2,435

From Norfolk, Suffolk, Essex, and Cambridgeshire, about 10,000 Scots and shorthorns have come to hand. The receipts from other parts of England have been 2,600, of various breeds; from Scotland, 1,500 Scots; and from Ireland 290 oxen.

The highest and lowest prices of meat have ranged as follows:—Beef from 3s. to 5s.; mutton in the wool, 4s. 2d. to 6s. 2d.; out of the wool, 3s. 4d. to 5s. 4d.; lamb, 5s. 6d. to 7s.; veal, 3s. 8d. to 6s.; pork, 3s. 8d. to 5s. per 8 lbs., to sink the offal.

COMPARISON OF PRICES.

	May, 1854.		May, 1855.		May, 1856.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef, from 3	2 to 4	10.. 3	0 to 4	8.. 3	0 to 4	10
Mutton .. 3	4 — 5	0.. 3	2 — 5	0.. 3	6 — 5	4
Lamb .... 5	4 — 6	8.. 5	2 — 6	10.. 5	4 — 6	6
Veal..... 4	2 — 5	8.. 4	0 — 5	4.. 3	10 — 5	6
Pork..... 3	6 — 4	8.. 3	0 — 4	4.. 3	4 — 4	8

Notwithstanding the high value of wool in the provinces, the flock-masters have wisely forwarded a much greater number of woolled sheep to the metropolis this month than in the ordinary run of years. If they generally did but consider the immense disadvantage, in a pecuniary point of view, which they invariably suffer from sending sheep to market deprived of their wool during inclement, or even moderately cold weather, they would at once wholly abandon the system of early shearing. Sheep in the wool on a cold morning will produce *quite* 2d. per 8lbs. more money than those shorn. Compare this loss with the possible advantage of retaining the wool for sale at certain marts and fairs, leaving additional labour out of the question, and it will be found that early clippings are productive of great loss to the farmer.

Newgate and Leadenhall have been fairly supplied with meat, in this a steady business has been transacted, as follows:—Beef from 2s. 8d. to 4s. 6d.; mutton, 3s. 2d. to 4s. 10d.; lamb, 5s. to 6s. 2d.; veal, 3s. 8d. to 5s.; pork, 3s. 8d. to 5s. per 8lbs., by the carcase.

EAST SUFFOLK.

At this period of the year an account of the crops in this vicinity may be interesting to my friends, and having taken a survey of them, beg leave to submit a brief report. Wheat from its first germinating proved a good plant and appeared healthy, and so continued throughout the winter. Part of the month of March and April proved warm and dry, so that it made rapid progress, spreading on the ground, and not sprouting as in some seasons, till about the 23rd April, when the weather set in cold, with N. E. wind and frosty nights, which somewhat gave it a rusty hue, but did no damage, further than check vegetation, which we consider was favourable; the change on the 11th of this month has given it the usual colour, and all soils promise a good crop and ten days earlier than last year. With a continuance of favourable weather an early harvest may be looked for, which, from the small stocks on hand of foreign wheat, and under an average quantity of English in the growers' hands, is to be desired. Those farmers who have finished thrashing out their crop report the yield under an average, which was not considered so shortly after harvest, and this applies to our best wheat lands. Barley was put in under the most favourable auspices, is progressing rapidly, and has a healthy appearance; the light soils will soon require rain.—Woodbridge, May 21.

Since the last report was written the weather has been generally of a cold and unkindly temperature, from which cause vegetation has sustained a very considerable check, and that at a season of the year when we hope for luxuriant growth. It is here necessary to remark that the last account was forwarded on the 24th of April, and intended for publication on the following Monday, but in consequence of some irregularity in the Post Office department, it did not reach its destination in time, and of necessity stood over till the following week. This will account for the great incongruity which must have been apparent in that communication, inasmuch that an unfavourable condition of the atmosphere and great change of temperature had intervened during the week between the writing and the publication of the report. From that period also cold dry easterly winds have been very prevalent. The 2nd of May was an exception, when there was some fine rain; but this was followed by cold and drying winds till the 13th, on which day more rain fell, and there was a heavy shower, accompanied with thunder and lightning on the following morning. On the night of the 20th it again commenced raining, and there is now a prospect of its continuance. It is satisfactory to mention that we have not recently experienced a recurrence of those severe nocturnal frosts which at this season of the year are productive of incalculable injury. The wheat on cold lands is not looking in the kindly condition to be desired; nevertheless warm and genial rains, with a mild atmosphere afterwards, will have a wonderful effect in restoring it. Barley suffers in appearance from the same causes; but the beans do not appear to have sustained injury. The strong adhesive soils, of which there is a considerable portion in this district, have worked unkindly, in defiance of the numerous implements now in use, calculated for the disintegration of tenacious masses; the rain which is now descending will obviate this difficulty, and facilitate the important operations of the season. Working the land for swedes and mangel has from this reason been in many cases interrupted. The cultivation of the latter root is annually on the increase in all parts of the kingdom. Some is already sown, and the plants are peeping through the soil. The grass lands do not respond to the cheering anticipations of the last account. The herbage has sustained a check in its growth, with the exception of that which lies in sheltered situations. Should we experience the blessing of a warm temperature after this rain the defects may be rectified; but present appearances do not indicate heavy crops of hay. Receding markets are not encouraging to holders of wheat, and many pause ere they thrash; indeed farmers are involved in doubt, whether it is most prudent to yield to present prices, or wait in expectation of improvement. It is, indeed, a difficult point to determine, but there certainly does not appear justifiable reason to anticipate any considerable augmentation, unless a succession of unfavourable weather should materially deteriorate the growing crops; and that likewise will, to a very considerable extent, be influenced by similar circumstances in foreign lands, so that it would be speculative and rash to offer an opinion. This may, however, be observed: there is evidently a greater bulk of wheat in farmers' hands than there was at this time last year. There are not any complaints of disease among either cattle or sheep, with the exception of those trivial disorders which are at all times incidental; still prices generally keep up. Sheep in condition for the shambles are now abundant in the markets, with a very slight depression in their value. Butchers' calves continue to be scarce, from the cause referred to in the last communication; and although the alarm has in a great measure subsided respecting the murrain on the continent, evidently a species of pluro-pneumonia, the value of horned cattle does not evince symptoms of decline. The prosperous condition of the people in the manufacturing districts occasions a very considerable consumption of beef and mutton, and great exertions will be necessary to keep the supplies in a ratio with the demand. In France too, the taste for substantial joints of meat appears to be in the ascendant, which cannot fail to have an effect upon foreign supplies, whatever may be the result on our home productions. The apple-trees are late this year in perfecting their blossoms, but the expectation of a crop of fruit is flattering. This will be most acceptable; for the stock of cider is very low.—May 21.

## AGRICULTURAL INTELLIGENCE, FAIRS, &amp;c.

**BANBURY FAIR.**—Business not very brisk, especially in cattle and horses. Sheep were a good supply, and sold briskly at from 4s. 8d. to 5s. per stone. The trade in fat beef was rather dull; sellers holding firm for previous prices, and buyers being little inclined to purchase at that rate, only bought to supply their present requirements. There was a large number of horses in the fair, which sold slowly at high prices.

**BERKELEY FAIR.**—The supply of all kinds of stock was good, and the attendance of dealers and others numerous. Several very good cows and calves were shown, and fetched high prices, as also did graziers. Mutton was plentiful; prices had a slightly downward tendency. The following are the quotations: Beef, 68s. to 70s. per cwt.; mutton, 9d.; veal, 7½d.; lamb, 9d. per lb.

**BOGBAIN MONTHLY MARKET.**—There was a large show of cattle, and the demand for all kinds of stock was better than at the last market. There were many dealers from the south and from Aberdeenshire present. A fair number of horses were shown, and a good number of sheep. Prices were high, the dealers being encouraged to buy by the favourable condition and prospect of the grass crop.

**CHIPPENHAM FAIR.**—A short supply of cattle, which sold at the full prices of late fairs. The sheep trade was heavy.

**DORKING FAIR.**—The show of fat and lean stock far exceeded in number and quality last year's, particularly Mr. Thomas Grissell's, of Norbury Park, and after somewhat pressing sales, ultimately a good clearance was effected, upon an average of about 4s. 6d. per stone. There was also a good show of sheep, but to effect sales lower prices were submitted to, viz. from 4s. to 5s. per head below the prices given at the last Guildford fair. The appearance of the nags in the horse-fair was certainly of a superior cast to what we have seen here in former years, and from £40 to £45 was readily given for horses suitable for farming purposes. The fair upon the whole was a very good one for effecting sales.

**DUNSMUIR TRYST.**—The numbers of cattle brought forward were rather short of the two immediately preceding years, but there was a large attendance of dealers, both local and from a distance; but owing to the dull accounts from the metropolis, the sales opened rather languidly. Prices were—prime fat, 9s. 7d. down to 9s., 8s. 6d., and 8s. per Dutch stone, according to quality. Two-year-olds, of the best sorts, brought from £12 to £15; year-olds, £5 to £8. Calving cows, young and of good symmetry, sold at much the same as fat per stone; old and inferior a dull sale. A few ewes and lambs appeared on the ground, but we heard of no sales being made. The market was considered stiff and dear, but by mid-day the greater portion of good sorts had changed hands.

**GLOUCESTER MONTHLY MARKET.**—A good supply of beef and mutton, which met with a dull sale. Butchers not being disposed to yield to former prices many head were returned unsold. Beef sold from 7d. to 7½d.; mutton, 7d. to 7½d.; lamb, 8d. to 8½d. per lb.

**GRANTOWN TRYST.**—The stock brought forward were chiefly small Highland cattle for grazing, with a sprinkling of polled beasts, and farrow and milk cows. From the high prices asked, business seemed rather stiff throughout; and those sold would be a shade lower than the prices obtained at the April market, notwithstanding that a good many dealers appeared on the ground, and were anxious to make purchases.

**HELMSLEY FAIR.**—A very large show of cattle; and prices ranged high. Calving cows and grazing stock sold readily, plenty of buyers being in attendance. Fat stock had quick demand, it being rather scarce. A small number of sheep, in which little business was done. The horses shown were generally of an inferior description; and the few good ones were soon cleared away.

**HENLEY-ON-THAMES FAIR.**—The supply of sheep was large; but the trade ruled heavy. Milch cows and barreners were particularly scarce and dear: high prices were asked and realized. Sheep from 40s. to 55s. each, tegs 34s. to 46s., couples 48s. to 65s. Milch cows £18 to £24, barreners £10 to £18 each.

**HEREFORD FAIR.**—The quality of the stock on offer was particularly good. There was a goodly show of fat cows, which were somewhat eagerly sought for by the butchers, both home and "foreign," who have of late experienced some difficulty in getting their supply. High prices were asked for all kinds of stock; fat cows realised 7½d. per lb., inferior 7d. There were many lots of prime young Hereford stock, for which capital prices were obtained; Mr. H. Gibbons, of Hampton Bishop, sold a lot of seven splendid two-year-old steers at £26 each, and many other sales were effected on terms equally good for the sellers. There were plenty of customers for sheep in the wool, either with or without their lambs; fat wethers still reached 9d. per lb., good ewes 50s. to 53s. each. Some pens of shorn wethers were sold at 7s. 6d. per stone, and lambs, sold singly, were worth 9d. per lb. The show of pigs was not a very extensive one, and young stores were taken up at high prices. The horse fair was well supplied with useful draught animals, which were bought up with some avidity. Good sound warranted carters fetched high prices. There were also a few useful hacks, and a few carriage horses.

**IPSWICH FAIR** was numerously attended by dealers. The show was decidedly superior to that of last year. Fat Beasts were in poor supply, and experienced a slow trade, at about 7s. 6d. a stone. Lean stock was in good supply and request, averaging from £6 to £14 a head. Sheep were in abundance, and prices were the shade lower. Fat mutton met a ready sale. For hoggets the average price was from 43s. to 48s.; a superior lot fetched 55s. There was an entire absence of superior horses; but there were a few cart-horses and hacks, for which high prices were asked.

**KNIGHTON FAIR.**—At this fair, on Monday, there was a pretty good supply of fat stock, and prices had a downward tendency. Fat sheep of the best quality realised 7d. per lb. Cows 6½d. to 7d. per lb.; useful cows and calves found purchasers at high prices. The horse fair was pretty well attended, many of the animals shown, however, were of inferior quality, and where sales were effected, a reduction from former rates had to be submitted to.

**LEDBURY FAIR.**—The supply of all kinds of stock, with the exception of pigs, was very good. The farmers were compelled to submit to a reduction of 1d. per lb. for fat sheep, and fat cows did not bring so much as at former fairs, although a good many buyers were in attendance. Some of the store stock, although offered at reduced terms, was driven home unsold, and the fair was therefore dull and rather protracted. Fat cows, 7d. per lb.; ditto sheep, in the wool, 8d.; ditto shorn, 6½d. to 7d.; store pigs, 24s. to 40s. each.

**LLANELLY FAIR.**—A great number of cattle, sheep, and horses changed hands, at advanced prices; and, upon the whole, it was a very brisk fair.

**NEWBURY FAIR.**—A good supply of horses, but many of them were rather inferior. The demand for cart horses and cart colts was slack, but as there were many London dealers present, good cab and bus horses sold at high prices. The cow fair was also well supplied, and the best cows with calf fetched £20; two-year-old heifers with calf sold from £13 to £16. There were some fine Devon oxen, which sold at high figures. On the whole, a good deal of business was transacted.

**OXFORD GREAT CATTLE MARKET** was distinguished above any that has been held for years, for the immense quantity of sheep that were there; indeed, so great was the supply, that the market was not sufficiently large to pen them all, and several droves were offered for sale in Beaumont-street and the adjoining one. The supply of good beef was short, while the demand was the reverse; the quotations being from 7d. to 7½d. per lb. Milch cows and calves were plentiful, with a fair demand, at prices ruling from 15l. to 23l.; mutton, shorn, from 7d. to 7½d. per lb. Ewes and lambs were much inquired after; single couples sold for 3l., double couples 4l. Store sheep were numerous, but not in much demand. Fat lambs were dear, 6s. 6d. the stone of 8lbs. being the current price. Very poor supply of horses, but rather dearer than the

previous market. The pig trade was brisk, with a fair supply, and quite as good prices were obtained.

**RAMSBURY FAIR.**—A large number of horses, the most of which was of an inferior description. Of cows, there was a large supply, the best of which fetched high prices.

**ROUGH HOG TRYST.**—The supply was smaller than usual; sales dull, and prices may be quoted as follows: bred and three-parts sold at from 36s. to 47s. 6d., half-bred from 28s. to 33s., and Cheviot from 21s. to 30s. There were few sales effected. Mutton fully 7d. per lb.

**ST. NEOT'S FAIR.**—The supply of stock at this fair was rather scant in quantity, and of no very striking character in quality. There were but few horses, and those evidently but sorry specimens of the "noble animal." A brisk trade took place in beasts, and some very augmented prices were made. The attendance of dealers was large, and from the spirited manner in which business was conducted the fair was soon cleared.

**SHERBORNE FAIR** was very well attended by dealers and farmers. Cows and calves, from 12l. 10s. to 15l. each; good heifers and calves, 15l. 10s. to 17l. 10s. each; barren heifers, 9l. to 13l. each; two-year-old heifers, 7l. to 8l. 8s. each; yearling heifers, 5l. 15s. each. The sheep fair was scantily supplied, the stock exhibited was good, the prices asked were high, and the sales few. Good Down hogs at from 45s. to 50s. each. The pig fair was very well supplied and realized good prices. Sows, in farrow, 4l. each; barren sows, 3l. 5s. to 3l. 10s. each; porkers, 10s. 6d. to 11s. per score; stores in good condition, 35s. to 40s. each; middling stores, 15s. to 18s. per head; small ditto, 11s. to 11s. each: the greater part found customers.

**STOKE-BY-NAYLAND FAIR.**—There was a large show of sheep and lambs, and a fair business was done in the latter at good prices. A more than average show of horses, chiefly of very inferior description, and but few sales effected. Neat stock was in good supply, but little business was done therein, the sellers refusing to submit to lower prices.

**STRATFORD-ON-AVON FAIR.**—A very large number of sheep were on the ground, but the demand was not so lively as was anticipated. Trade was heavy, and farmers were compelled to submit to a reduction of 0½d. per lb.; prime small meaty sheep, 6d. to 7d. per lb., but several pens were driven home unsold. Beef was in short supply, and active trade done at 7d. to 7½d. per lb.

**THATCHAM FAIR.**—There was a large number of dealers present, but the supply of cattle was short, and there was not half enough on sale to meet the wants of purchasers,

consequently many things changed hands a second time, at good prices.

**TOLLER DOWN FAIR** was well supplied with stock, which readily found purchasers, but sheep scarcely fetched so high prices as of late.

**TOWYN FAIR.**—The supply of cattle was small. Two-year old steers realized prices about the same as at the last fair. Milch cows fetched from 10l. to 14l. Pigs were very high; suckers six months old sold for 13s.; stores, from 1l. 3s. and upwards.

**WHIT'SUNBANK FAIR.**—As is well known the leading feature in this fair is the show of rough hogs, of which there was a much larger number than last year. From the general weather we have lately had it was expected that it would be a dear fair, which expectations, however, were not realized. Amongst the bred hogs, Mr. Boyd, Doddington, sold for 45s. 6d., being, so far as we saw, the highest price in the market. Mr. James Brandon sold at 41s. These prices show a decline of 7s. and 8s. a-head below last year's prices. Half-bred hogs were bringing from 32s. to 37s. a-head. Ewes and lambs, of which there were a good many small lots, were selling readily at very good prices. Queys, calved and to calve, were bringing from £10 to £15. There were not many grazing cattle in the market; the best lot we saw were sold by Mr. Thos. Wightman for £14 10s. There were a few good draught horses, and a trade seemed to be doing in them. Some useful hacks and ponies were also on the ground. For sheep we think this was a cheap fair, and the hogs bought cannot fail in remunerating the purchaser. In fact there were not buyers for the quantity of hogs shown, so that a large proportion of them were not disposed of.

**IRISH FAIRS.**—**NAVAN GREAT SUMMER FAIR:** The great summer fair of Navan, established by Mr. Matthew Kealy in 1854, took place on Monday. Mr. Allen, Coshetown, sold five springers from £14 to £16 each; Mr. Kennedy, Navan, two springers at 15s. each; Mr. William Weldon, Cross lane, a two-year-old springer at £12; Mr. James McGain, Navan, two springers at £11. Patrick Matthew, Esq. J.P., Anagore, bought 100 store heifers at a high figure. There was a beautiful lot of calves sold at 35s. to 45s. each. The sheep fair was well stocked, principally with mutton and store lambs, both of which sold extremely high. The pig fair was, as is usual in Navan, largely supplied with bacon, which sold at extremely high prices, the average price was 60s. per cwt. Beef 62s. 6d. per cwt.; Mutton, in the wool 9½d. per lb., without wool 7½d. per lb. The fair was over early in the day.

## REVIEW OF THE CORN TRADE.

### DURING THE PAST MONTH.

The month of May opened with a very cheerless aspect, a sharp east wind giving a severe check to vegetation; but in the course of a week a sudden change to warmth occurred, which more or less has since prevailed, with the addition on the 22nd of a heavy day's rain and subsequent light showers. The face of Nature has therefore regained its look of promise, and the fears of drought as respects spring corn have entirely disappeared. The vicissitudes through which the season has passed remind us of possible disasters; but it would be ungrateful and unreasonable to give way to distrust. There is no danger at present to be apprehended either of a deficient or late harvest. The upward tone with which April closed was somewhat abated on the first set-in of a genial temperature; but the decline then experienced has

since been more than recovered, leaving some gain in prices in the course of the month—say, about 2s. per qr. through the country, with a better tone evinced than for some time past. Several causes have conduced to this state of things. The cold weather which kept vegetation backward greatly improved the condition of the wheat in stack, and all the country markets noted the welcome fact. The comparative absence of foreign supplies enabled holders in granary to greatly reduce their stocks, which were constantly in demand for mixing. Growers and the mercantile interest in the grain trade were in a sufficiently healthful position to bear against the general monetary pressure, and the state of foreign markets as the season advanced were found unprepared both as respects stocks and prices to send forward the quantities expected.



The immensely free contributions of America last autumn were damaging to importers; and orders, should equal supplies have been again forthcoming, would have been carefully limited, or expeditions must have been made on American account; but with the navigation opening very late, and New York itself exhausted, prices have been steadily rising, with little regard to European advices, and accounts now from the sources of supply, both north, west, and south, show there could be no repetition of such liberal shipments, with the most tempting prices. The rates of fine white wheat at New York have risen to 65s. per qr., and of fine red to 58s. per qr., thus showing a parity with our own quotations, and that shipments without a further advance here must sink freight and charges. Spain herself has required further imports; and the retrograde movement in prices, helped on by forced Government sales, have given place to an advance in the face of fine weather and genial showers, so that 1,000 qrs. were shipped hence to Santander last week, after a repetition of dull advices. The Baltic has little fine wheat to send, the crop generally being very light, damp, and inferior. The prices at Danzig by last accounts were for good wheat 64s. 3d. per qr. At Riga rates ranged from 52s. 6d. to 56s. Petersburg quotes for Cubanka and Saxonska about 57s. per qr. The ports in the Danube and Black Sea, till recently, were quoting lower prices; but a general rise has now occurred through the accounts received from the South of France, Sardinia, and ports of Italy. Soft Polish wheat at Odessa has risen to about 55s. per qr. At Berdianski it was 54s. 9d. Soft quality at Taganroc, previously to last European advices, was 46s. 6d., and hard to 57s. per qr.; but these rates are no longer reliable: a freight was taken 8s. 9d. Both Galatz and Ibrail were becoming excited, and the large fleet that had passed the Dardanelles was certain to add to holders' demands; but it was doubtful whether there would be sufficient stocks to freight them. Nothing was coming from Egypt, the people being oppressed at Cairo and Alexandria by retail prices to a degree that made it necessary for Government to interfere. Trieste quotes 60s. 6d. for Banato wheat. At Leghorn Egyptian wheat had reached 51s. 6d. per qr., and it was the same price at Marseilles. At Genoa soft Marianopoli wheat was worth 72s., and hard Taganroc about 80s. per qr. Holland, Belgium, and France have little changed since our last. At Amsterdam white Polish wheat was worth 64s. 6d.: native red at Antwerp brought 59s. per qr. In Paris fine white Normandy wheat was still bringing 65s. per qr., and the large supplies continually received at Marseilles were soon worked off, bringing higher rates than expected.

African wheat at this port was worth 73s. 6d. per qr.

The crops generally in Europe were promising; but rye was less favourably spoken of in the Baltic provinces, and some heavy rains in America had done harm at Louisiana and Alabama, but not seriously. The stock of native wheat in our own country yet appears to be good, though a great portion must have gone into consumption for low purposes, from its inferiority; and those who have held out for remunerative prices through a succession of dull markets, are not likely in its improved condition to force it off to disadvantage—the weather, the price, and the prospect on their own grounds suggesting their course.

The first Monday in London commenced on moderate supplies, both English and foreign. The morning's supply from Kent and Essex was fair, and in better condition; but with a continuance of cold harsh weather factors endeavoured to establish an advance of 1s. to 2s. per quarter, eventually failing to do so, though occasionally an improved sale occurred. The consequence of this holding out for higher rates was the finding nearly the whole bulk unsold at the close of the day. Holders of foreign also requiring some advance, could only occasionally obtain it. In some country markets holders were more successful, but Bristol, Gloucester, and Norwich made no advance. Newcastle and Gainsborough rose 1s. Lynn, Hull, and Manchester were 1s. to 2s. higher; Birmingham and Spalding quoting 2s. per qr. more. The Tuesday's market also at Liverpool was 3d. to 4d. per 70lbs. dearer, but the upward movement ceased on Friday. The second Monday had an unusually small supply of foreign wheat, and only an average one of home-growth. The morning's contributions from the near counties was not large, but the previous week having ruled dull, and left part of the supply unsold, there was a larger show of English wheat on the stands than had been seen for some time. The weather, too, having changed to genial, with some rain, very few sales could be effected at previous rates, and those only to needy buyers, and a fall of 1s. to 2s. per qr. would have been gladly accepted to clear the stands: the bulk, therefore, was unsold. This report upon the country advance checked the rural markets and seaport towns. Ipswich and Louth noted, however, no difference. Newark and Gloucester were only 1s. down; but Hull, Wakefield, and Uxbridge answered the London report of a decline of 1s. to 2s., Birmingham, Bishop Stortford, and Newcastle being fully 2s. cheaper. Liverpool, on Tuesday, was brought to a pause, and on Friday submitted to a fall of 1d. to 2d. per 70lbs. The third Monday was but poorly supplied, but the feeling of the

previous week had hardly subsided, and, to sell, factors found it necessary rather to favour buyers, the weather having been splendid. As often happens at the turn of prices, the country markets differed materially in their reports: some markets were fully 2s. to 3s. down; but Bristol and Gloucester showed an upward tendency, while Birmingham fully recovered from the previous depression, and, with Norwich and Newcastle, noted an improvement of 2s. per qr. Liverpool, on Tuesday, had a full reaction in sellers' favour from the previous decline, and on Friday a further advance of 2d. to 3d. per 70lbs. was quoted. London also recovered on Friday, and evidently pointed to higher rates on the next market. The fourth Monday came, and with it Friday's anticipations were realized, there being no difficulty in selling either English or good foreign wheat at fully 2s. per qr. more money.

The supplies in the metropolis were less as respects foreign wheat than in the previous month by about 2,500 qrs. weekly, the English arrivals also falling short about 600 qrs. per week. The quantities received were, in English wheat, 28,600 qrs., in foreign 20,067 qrs. The sales for the last four weeks show an increase of 77,110 qrs. as compared with April; but are still 5,804 qrs. below what they were last year, showing that with a fair stock on hand there has been less disposition to sell at reduced rates. The general averages commenced at 53s. 2d., and closed at 57s. 5d., showing an advance of 4s. 3d., while our estimate, by reports received, has been only 2s.; the rise to the amount of 2s. 3d. must therefore be attributed to the improved condition. The London averages put back one week, to be on a level with the general averages, show the difference only 2s. 4d. advance, commencing at 53s., and closing at 64s. 4d. The exports all took place in the fourth week, and reached 1,950 qrs., with 1,115 sacks of flour. In flour through the month fluctuations have been inconsiderable, and limited to country sorts and American. Norfolks on the first Monday were 40s. per sack, and closed at 42s.; the hot weather occasioned a temporary fall, but the reduction of supplies and influence of the wheat market more than recovered the depression. Through the month, however, town millers have not varied the price, it being still 52s. per sack, the difference between the best town-made and Norfolks being now only 10s. The supply for the month from the country has about equalled the previous month, being 71,448 sacks or 2,717 sacks more; but the arrivals from America have been quite insignificant, viz., in all but 3,761 brls., with 110 more sacks foreign. With light arrivals and advancing rates at New York there does not seem much probability of abundance from this quarter till markets change, good Ohio

flour being worth 33s. 6d. per brl. at home, which is equal to 48s. per sack.

The barley trade having passed its zenith, has become of less interest. Prices have scarcely varied through the month, and the whole dependence has been on foreign supplies, our own crop being well nigh exhausted. The higher qualities of foreign, with the close of the malting season, have become less saleable, and easier in price; but those for grinding, of average weight and condition, as well as good barley for distillation, have all been well supported, and the month closed with sales against buyers. The low price lately obtained for wheat has stimulated farmers to sow a large breadth of this grain, as the quality of British-grown is beyond competition; but should it exceed the demand for malting, there may be some disappointment. As it is, there seems little probability of a decline on this grain up to harvest, as foreign markets have not been prepared for an extensive demand, and prices in all the Baltic ports have been gradually advancing.

The receipts of home-grown during the month, in London, have only been 1,121 qrs., the foreign being 51,415 qrs., or only half the supply in April. Malt through the month has scarcely changed, though stocks cannot be great.

The oat trade, which began to recover the last fortnight in April, has steadily but slowly progressed, the improvement on prices being about 1s. 6d. per qr. The first and second Monday each gained 6d.; the third was firm, but sales were slow; and the fourth was nearly 6d. dearer, though not so quoted generally. The favourable change in the weather prevented a more decided rise on the last market. The crops are now looking well on the ground, though recently threatened by the drying cold winds, the grass lands with very few exceptions, being all that can be desired.

The month's arrivals show a general falling off, and as we anticipated from the first, Ireland gives no promise of liberal shipment, the failure of the stock of potatoes in the west making some demand on the crop for human food; nor do we think it likely that foreign importations will be so great as to make up the deficiency, or occasion any permanently low price. The receipts in English corn were 1,598 qrs.; in Scotch 761 qrs.; in Irish only 9,740 qrs., and in foreign 55,328 qrs.; both the Irish and foreign receipts being less than half what they were in April.

The supply of English beans had been fair, but foreign arrivals have almost failed, and the consequence has been a further improvement of 1s. per qr. at a time of year when consumption is lessened. The advance occurred on the first Monday, and has since been steadily maintained for all good dry



POTATO MARKETS.

**SOUTHWARK WATERSIDE, MONDAY, May 25.**—During the past week the arrivals both coastwise and from abroad have been liberal for the season, which, coupled with warm weather, has caused a reaction in the trade, and prices looking down. The following are this day's quotations:—

York Regents	per ton	120s. to 150s.
Finscolshire do.	.....	100s. to 130s.
East Lothian reds	..	120s. to 130s.
Perth, Forfar, & Fishk. Reg.		110s. to 130s.
Do. Reds	.....	110s. to 120s.
Irish Whites	.....	85s. to 100s.
German whites	.....	80s. to 90s.

**BOROUGH AND SPITALFIELDS, LONDON, MONDAY, May 25.**—The supply of home-grown potatoes are only moderate, and the receipts from Scotland have fallen off. The imports last week were seasonably large—viz., 275 tons from Antwerp, 3 baskets from Emden, 97 tons from Rotterdam, 25 tons from Harlingen, 90 tons from Hambro', 15 tons from Oporto, 75 packages from Lisbon, 70 tons from Londonderry, and 90 tons from Newry. The trade generally is inactive, as follows:—

York Regents	per ton	100s. to 170s.
Kent and Essex ditto	.....	160s. 160s.
Scottish ditto	.....	95s. 130s.
Ditto Cups	.....	90s. 105s.
Midlands	.....	75s. 85s.
Lincolns	.....	90s. 110s.
Blues	.....	80s. 95s.
Foreign	.....	80s. 90s.

**COUNTRY POTATO MARKETS.—YORK, May 16.**—A fair show of potatoes, at from 12d. to 13d. per peck, and from 3s. 3d. to 4s. per bushel. **LEEDS, May 19.**—A fair show of potatoes, which sold at 13d. to 15d. wholesale, and 14d. to 16d. per 21lbs. retail. **THIRSK, May 18.**—Potatoes, 10d. to 12d. per stone. **RICHMOND, May 16.**—Potatoes, 5s. per bushel. **MANCHESTER, May 19.**—Potatoes, 12s. to 13s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

<b>BUTTER, per cwt.:</b>		<b>CHEESE, per cwt.:</b>	
Friesland	50 to 85	Cheshire	78 84
Kew	95 100	Cheddar	74 84
Darset, new	91 98	Double Gloucester	60 74
Carlow	— —	HAMS, York — new	90 100
Waterford	— —	Westmoreland	80 100
Cork	83 92	Irish	84 96
Lincolns	84 90	BACON	— —
Shrop	80 86	Wiltshire, dried	74 78
Passey, per dozen	11s. 6d. to 13s. 6d.	Irish, green	65 70

WOOL MARKETS.

BRITISH WOOL MARKETS.

**BERMUDSEY, SATURDAY, May 23.**—There has been a considerable amount of business in wools made from a reduction of 2d. to 3d. per lb. from the highest rates by dealers, who thought it prudent to lower their stocks of wool on the approach of the new clip; the manufacturers consequently supplied their immediate wants, and are now holding off, as they complain of the unremunerative nature of the trade, and the necessity of stopping their machinery, which great numbers have already done to bring about a due proportion between the price of wool and the manufactured article. The following are the nominal prices of new fleeces:

Per pack of 240 lbs.

Fleeces—Southdown Hogs	£20 16 to £21 0
Do. Half bred Hogs	10 0 20 0
Do. Kent	17 10 18 0
Do. Southdown Ewes and Webers	18 0 19 0
Do. Leicester do.	17 0 18 10
Sorts—Clutting, picklock	22 0 23 0
Do. Prime and jocklock	19 10 20 0
Do. Choice	18 0 19 0
D. Super	17 0 18 0
Do. Combing—Wether matching	22 0 23 0
Do. Picklock	19 10 20 0
Do. Common	16 0 17 0
Do. Hor matching	23 10 24 0
Do. Picklock matching	20 10 21 10
Do. Super do.	17 10 18 10

**LEEDS WOOL MARKET, May 21.**—There has been rather more done in sales of wool this week, and prices are quoted firm, at last week's rates.

LIVERPOOL WOOL MARKET, MAY 23.

**SCOTCH WOOL**—There continues only a demand for laid Highland from the trade to supply immediate wants, but as stocks are in the most limited compass there is no fluctuation in prices. White Highland is scarce, in fact not to be met with. The trade having supplied themselves with Cheviot and crossed at the late auction sales here, they are not much inquired for.

Laid Highland Wool, per 240 lbs.	s. d.	s. d.
White Highland do.	16 0	17 0
Laid Crossed do. unwashed	18 0	20 0
Do. do. washed	20 0	22 0
Laid Cheviot do. unwashed	23 0	25 0
Do. do. washed	23 6	25 6
White Cheviot do. washed	31 0	34 0

FOREIGN WOOL MARKET.

**CITY, MONDAY, May 25.**—The public sales of colonial wool have proceeded with steadiness, and in some instances rather more activity has been apparent in the bidings, especially for Sydney and Port Phillip qualities. The attendance of both home and foreign buyers is good, and prices generally had an upward tendency.

**LEEDS (FOREIGN) WOOL MARKET, May 22.**—There is very little improvement in the demand, and prices are without alteration.

	Per lb. Duty Free.	s. d.	s. d.
German, (1st and End Elect	.....	3 4	4 6
Saxon, { Prima	.....	2 4	3 0
and { Seconda	.....	2 0	2 4
Prussian, { Tertia	.....	1 8	1 10
Australian & V.D. Land—Combs & Clothing	.....	1 4	3 2
Do. Lambs	.....	1 8 1/2	2 2 1/2
Do. Locks and Pieces	.....	0 10 1/2	2 1 1/2
Do. Grease	.....	0 10	1 3 1/2
Do. Skin and Skips	.....	1 4	2 1 1/2
S. Australian & S. River—Combs & Clothing	.....	1 6	2 6
Do. Lambs	.....	1 6 1/2	2 1 1/2
Do. Locks and Pieces	.....	1 1 1/2	1 7 1/2
Do. Grease	.....	0 7 1/2	1 4
Do. Skin and Skips	.....	1 8	2 2 1/2
Cape—Average Flocks	.....	1 0	2 1 1/2
Do. Combing and Clothing	.....	1 1	2 1 1/2
Do. Lambs	.....	1 4 1/2	2 1 1/2
Do. Locks and Pieces	.....	1 5	1 10 1/2
Do. Grease	.....	0 8 1/2	1 5

MANURES.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO, (per ton, for 30 tons nominal)	£13 5 0 to £6 0 0
Do. (per ton, under 30 tons)	14 15 0 to 15 0 0
BOLIVIAN GUANO	12 0 0 to 12 10 0

ARTIFICIAL MANURES, &c.

Nitrate Soda	£19 10 0 to £20 0 0	Sulphate Copper or Roman Vitriol, per Whetstepping	£ 4 s. d. 42 0 0 to 43 0 0
Nitrate Potash or Saltpetre	29 0 0 30 0 0	Salt	1 5 0 2 0 0
Sulph. Ammonia	17 10 0 18 10 0	Bones, Dust, per qr.	1 5 0 1 6 0
Muriate ditto	22 0 0 23 0 0	Do. 1/2 inch.	1 4 0 1 5 0
Superphosphate of Lime	6 0 0 0 0 0	Oil Vitriol concentrated, per lb.	0 0 1 0 0 0
Soda Ash, or Alkali	0 0 0 8 0 0	Do. Brown	0 0 0 6 0 0
Gypsum	2 0 0 2 10 0		
Coprolite	5 15 0 4 0 0		

OIL-CAKES.

Linseed-cakes, per ton — in bulk, or bags	£9 15 0 to £10 5 0	Marseilles	£9 0 0 to £9 0 0
Thick do. round	8 10 0 9 0 0	English	10 0 0 0 0 0
		Rape-cakes, per ton	6 5 0 6 10 0

JOHN KEEN, 35, Leadenhall-street, (Late Odams, Pickford, and Keen.)

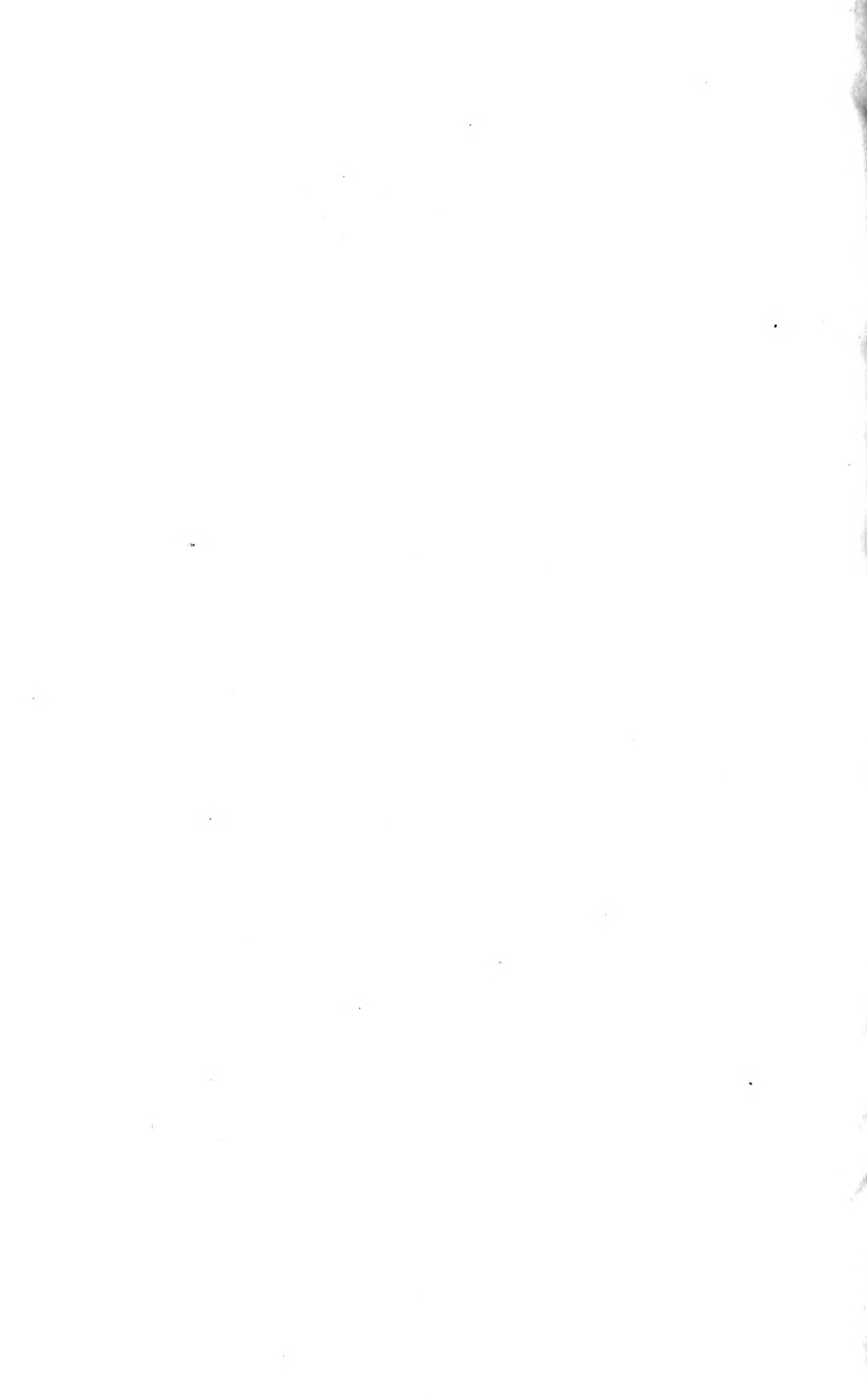
Williams & Co., 21, Mark Lane—Azotic..... £6 10 0

Manufactured by Hodgson & Simpson, Wakefield, and Matthews & Co., Driffield.

Anomonia Phosphate and Nitro Phosphate..... per ton £8 0 0  
 Superphosphate of Lime..... 7 0 0  
 Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops..... per ton £8 10 0  
 Prentice's Turnip Manure..... 7 0 0  
 Prentice's Superphosphate of Lime..... 6 10 0  
 Lancashire Manure Company, Widnes, near Warrington.  
 J. Knight & Co.'s Nitrogenized Bone Manures..... per ton £8 15 0  
 Manure Works, Gresham, Beverley.  
 Tigar & Co.'s Celebrated Turnip Manures..... per ton £7 10 0











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